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Long-Term Consequences of the *Exxon Valdez* Oil Spill for Coastal Communities of Southcentral Alaska

by

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Notice

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Table of Contents

List of Tables

List of Figures

List of Acronyms and Abbreviations Used in the Text

AAC	Alaska Administrative Code
ADCRA	Alaska Department of Community and Regional Affairs
ADF&G	Alaska Department of Fish and Game
ACFEC	Alaska Commercial Fisheries Entry Commission
ADEC	Alaska Department of Environmental Conservation (also DEC)
ADHSS	Alaska Department of Health and Social Services
ADOL	Alaska Department of Labor
AKP	Alaska Peninsula
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
BIA	Bureau of Indian Affairs
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRRC	Chugach Regional Resources Commission
CWF	Columbia Ward Fisheries
DEC	Alaska Department of Environmental Conservation (also ADEC)
Division	The Division of Subsistence of the Alaska Department of Fish and Game
EVOS	*Exxon Valdez* Oil Spill
EVOSTC	*Exxon Valdez* Oil Spill Trustee Council
FDA	Food and Drug Administration (also USFDA)
FY	Fiscal year
FFY	Federal fiscal year
IAI	Impact Assessment, Inc.
IHS	Indian Health Service
KANA	Kodiak Area Native Association
MMS	Minerals Management Service
MOU	Memorandum of Understanding

NANA	Northwest Alaska Native Association
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resources Damage Assessment
OCS	Outer Continental Shelf
OPA	Oil Pollution Act
OSHTF	Oil Spill Health Task Force
PAH	Polycyclic aromatic hydrocarbons
PSP	Paralytic Shellfish Poisoning
RurALCAP	Rural Alaska Community Action Program
PWS	Prince William Sound
SERVS	Ship Escort Response Vessel System
SETAC	Society of Environmental Toxicology and Chemistry
SEQ	Social Effects Questionnaire
SPSS	Statistical Package for the Social Sciences
TEK	Traditional Ecological Knowledge
TM	Technical Memorandum
TAPAA	Trans-Alaska Pipeline Authorization Act
USFDA	US Food and Drug Administration (also FDA)
USFWS	United States Fish and Wildlife Service

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This final report draws heavily from our prior research efforts in the EVOS area. The *Exxon Valdez* Oil Spill Trustee Council and the US Fish and Wildlife Service helped fund some of these earlier rounds of household interviews.

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Chapter One: Introduction

THE STUDY BACKGROUND

Industrial disasters are a potential, perhaps inevitable, consequence of natural resource development. In Alaska, development of oil fields on the arctic North Slope has produced wealth for a broad spectrum of groups during the late 20th century. Beneficiaries include oil companies, subsidiary businesses, state and local governments, and the citizens of Alaska as a whole through a stimulated state economy and annual dividends from state-invested oil royalties. Yet injury has accompanied wealth. In 1989, an industrial failure produced one of the worst environmental disasters in American history. The wreck of the tanker *Exxon Valdez* on March 24, 1989, spilled 11 million gallons of crude oil into the Pacific Gulf of Alaska. The disaster occurred eight hundred miles to the south of the oil fields, near the terminus of the Trans-Alaska Pipeline at Valdez. The spill contaminated over 1,200 miles of coastline from Prince William Sound to Kupreanof Point on the Alaska Peninsula. The oil caused massive injuries to the natural environment, including populations of fish, marine mammals, and birds. It disrupted human uses of these natural resources. Exxon was assessed $1.15 billion by the federal US District Court for these damages (EVOSTC 1999:8).

The *Exxon Valdez* oil spill (EVOS) had profound implications for human communities in the spill area. The oil spill posed an unexpected threat of uncertain dimensions for cities, towns, and villages of the Pacific Gulf region. The Alutiiq villages of the Pacific Gulf appeared particularly threatened, because the culture, economy, and way of life of small Alaska Native villages are directly tied to healthy, productive ecosystems (Wolfe and Walker 1987). The people of the Pacific Gulf were forced to respond to a series of external challenges triggered by the disaster – drifting oil, oiled coastlines, disrupted fisheries, contaminated wild foods, damaged fish stocks, and protracted litigation. In the aftermath of the spill, they also had to respond to changing economic and political conditions, some a direct result of EVOS and others independent of the spill itself but part of the broader context in which spill response took place. Some challenges and responses lasted for years, and some continue 10 years and more after the *Exxon Valdez* hit Bligh Reef.

This report explores these immediate and longer-term effects on human communities in the Pacific Gulf. The report was prepared by the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) under a cooperative agreement with the US Department of the Interior, Minerals Management Service (MMS) (Cooperative Agreement No. 14-35-0001-30788) entitled "Sociocultural Consequences of Alaska Outer Continental Shelf Activities: Data Analysis/Integration." Detailed information on the impacts of the EVOS was collected under two previous agreements between MMS and ADF&G (Cooperative Agreements 14-35-0001-30539 and 30622). Basic descriptive and univariate analysis drawing from these data sets was presented in Fall and Utermohle (1995). The general purpose of the new cooperative agreement was to conduct a comparative analysis that collected new ethnographic materials and integrated existing quantitative and qualitative data across communities, cultural groups, local socioeconomic systems, and households. The project consisted of seven interrelated tasks, as described below. The cooperative agreement was amended in 1998 to support the addition of data from a new round of systematic household interviews in eight communities of the EVOS area, funded by the *Exxon Valdez* Oil Spill Trustee Council (EVOSTC) (Fall and Utermohle 1999).

While a number of communities are examined, the report focuses on the responses of Alutiiq villages in the spill area. The purpose is to describe how human communities responded to the spill. Most of the information derives directly from residents in the spill area, provided through several systematic face-to-face household surveys in Pacific Gulf communities and through ethnographic research. As shown in the following pages, the findings strongly indicate that in most communities, families actively adapted to the industrial disaster in ways that protected the well being of family members, and that preserved traditional cultural elements in the community's way of life. Most Alutiiq villages appear to have endured the disaster through the hard choices and work of extended families and tribal governments. This outcome is a testament to the durability of traditional ways of living that support contemporary Alaska Native communities. The report also describes the changing natural, social, economic, and political landscapes of the post-spill era that continue to challenge the adaptability of this traditional way of life. It is hoped the experiences and knowledge shared by the Pacific Gulf communities in this report may help others to deal with potential future disasters and the inevitable changes that continued development of natural resources will bring.

DISPARATE CLAIMS

Despite the magnitude of the *Exxon Valdez* oil spill, there exist disparate claims concerning its effects on human communities. A primary goal of this report is to examine these claims, which need to be acknowledged at the outset because they have contributed to alternative "social constructions" of the EVOS. As interpretations of the meaning of the spill and its aftermath, social constructions develop through discourse involving industry (oil, fishing, and tourism, for example), governments (federal, state, and tribal), scientists (who themselves may be employed by competing interests), the media, and the public. In turn, social constructions shape responses to the event. (We return to these themes in Chapter Nine.)

Early claims about the effects of the spill were commonly subjective and not grounded in any systematic information. In some cases, claims about effects were offered in the service of particular vested interests. Consider, for example, these two summaries of the effects of the spill on Chenega Bay and Tatitlek, the two Alutiiq villages closest to the spill in Prince William Sound.

The first is a subjective assessment from a journalist, depicting a cultural group allegedly isolated from a "cash economy" being destructively thrust into the late 20th century by the spill and clean-up.

> **Chenega Bay, Alaska** -- This is the way it was: The smell of roasting seal drifted through the village. Clams were piled high in buckets. Hunters proudly described their conquests. Children listened quietly as elders passed down their knowledge. Money was sparse, but not needed. The land and sea provided.
>
> This is the way it is: Seals are scarce, and there are odd sores on some of the shellfish. Hunting has all but ceased. Food comes by airplane from grocery stores hundreds of miles away. And money, while more abundant, has become vital.
>
> What happened in between was the *Exxon Valdez*. . . Together, the oil spill and its aftermath have turned Chenega Bay's subsistence economy into a cash one -- there is more money to buy things, less nature to live off -- altering everything from the village's social fabric to its dinner menus (Woestendiek 1991).

The second assessment is by two anthropologists under contract as experts to the Exxon Corporation in post-spill litigation. It portrays the spill as a relatively minor event in a long series of assaults on an already vastly altered culture.

> . . . Put into the context of socioeconomic change and adjustments to past social disasters that the Alutiiq people have experienced, the *Exxon Valdez* oil spill was not a determinant event. Its chief distinguishing characteristic is that blame could be attached and lawsuits filed, causing problems that the oil spill itself never could have caused. The spill could thus become the scapegoat for many of the changes in the Alutiiq environment (physical and cultural) that have occurred in the twentieth century (Wooley 1995:148-149; cf. Wooley and Bohannon 1994:28).

These two disparate statements establish a vast gulf of interpretation. The journalistic view is simplistic, romanticized, and, presumably, written to what sells to a reading public. The second view is litigious positioning which, if accepted in court, could possibly relieve Exxon Corporation of certain damage claims filed by the Alaska Native people of the spill area. Each of these assessments contains assumptions about the condition of communities before the spill and dimensions of sociocultural and economic change already underway at that time.

Compare these two assessments with a third statement about effects on the community of Tatitlek, provided by the president of the Tatitlek tribal government, made during the first year of the spill:

> Mussels, clams, starfish -- things are dying off and floating up on the beaches. The tides come and go out, come in and go out. The scientists do their research one-day, and everything looks fine. But what about the tide coming in? There's frustration, uncertainty and fear -- a fear of what the future's going to bring. We go from fear to anger to frustration with this thing. It's going to be with us for a long time (G. Kompkoff, President, Tatitlek Village Council, *in* Alaska Oil Spill Commission 1990:70).

The issues presented by Kompkoff are of importance to residents of the village nearest the spill, who depend on wild foods for survival, and raise important questions. What exactly did the oil do to the natural environment? Are local observations about mussels, clams, and starfish related to oil contamination? How dynamic are effects? Can yesterday's scientific observations about food safety be trusted as a guide to today's conditions? How long will the uncertainty last? Kompkoff reports frustration, fear, and anger in Tatitlek the year following the spill.

The image of the incoming tide provides a metaphor for what appears to be from a historical perspective a relentless surge of forces bearing on Tatitlek, and other communities of the Pacific Gulf, day after day. In the years following the oil spill, what did this ebb and flow bring communities? Threats? Challenges? New possibilities? The goal of this report is to describe what did transpire after the oil spill in Pacific Gulf communities. Grounded in the systematic reports of community residents and ethnographic and survey research, the report seeks to provide a well-supported assessment of the effects of the spill and its aftermath on communities, placed in the historical context of continuity and change in the Pacific Gulf region.

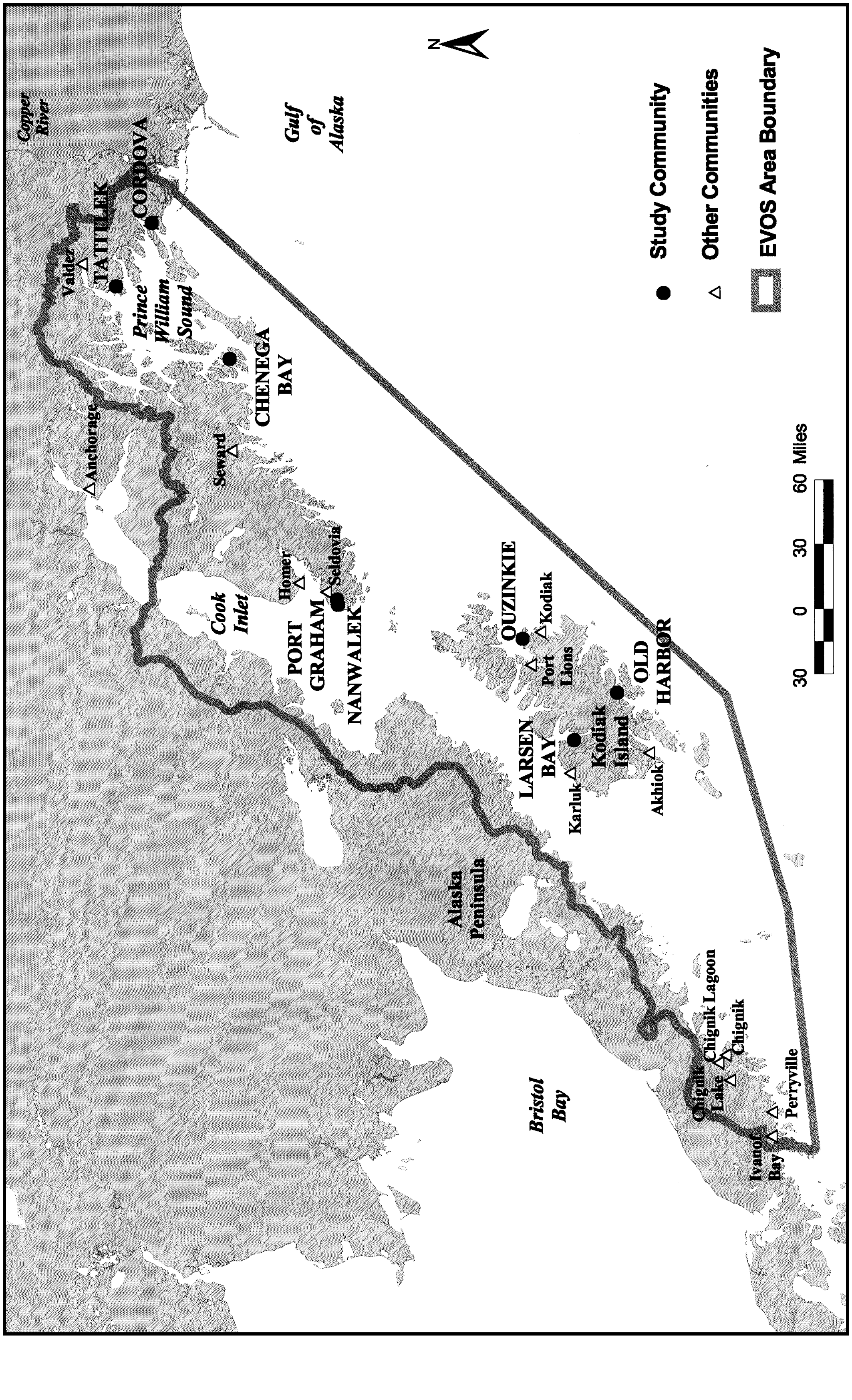
STUDY COMMUNITIES

Coincidentally, the final definitive map of the oil spill area as produced by the EVOSTC in 1993 is almost coterminous with the traditional territory of the Alutiiq people, stretching from the Copper River Delta in the east for about 600 miles along Prince William Sound, the outer Kenai Peninsula Coast, lower Cook Inlet, the Kodiak Archipelago, and the Alaska Peninsula to Kupreanof Point (Fig. I-1). (There are a few Alutiiq communities on the Bristol Bay coast of the Alaska Peninsula that are not in the spill area.) Additionally, to the east of Prince William Sound itself, the Copper River delta was home to the Eyak. Tlingit territory stretched from southeast Alaska as far as the Bering River, just to the east of the Copper River. Descendents of these latter two groups, as well as Alutiiq, live in Cordova today. In Cook Inlet, traditional Dena'ina Athabaskan territory included the Kenai Peninsula as far south as Seldovia.

At the time of the spill, there were 15 Alaska Native communities within the region traditionally inhabited by Alutiiq-speaking people and also within the spill area. Alutiiq, also called Sugpiaq, Sugcestun, Pacific Yup'ik, or "Aleut," is a language of the Aleut-Eskimo linguistic family most closely related to Central Yup'ik (Woodbury 1984:53). The Alutiiq way of life has always been oriented towards the shorelines and the sea, focusing on such subsistence activities as salmon and other fishing, marine mammal hunting, and marine invertebrate gathering (Clark 1984:195-196). The Alutiiq people were among the first in Alaska to be subjected to European and American exploration, colonization, and attempts at economic and cultural subjugation. Despite over 200 years of contact, the Alutiiq communities have maintained a way of life based upon subsistence uses of fish and wildlife resources and other Alaska Native cultural traditions (e.g., Davis 1984, Fall 1999b). (More detail on the traditional culture and history of the study area appears in Chapters Three and Four.)

Although some of the contemporary Alutiiq communities have become established in their present locations relatively recently, most of these communities' families have lived in this region for many generations. Tatitlek is the oldest inhabited community of Prince William Sound, while Chenega Bay is the newest. Chenega Bay was founded on Evans Island in 1983 by former residents of the old village of

Figure I-1. Location of Study Communities within *Exxon Valdez* Oil Spill (EVOS) Area Boundary.



Chenega, which had been destroyed by a tsunami following the great earthquake of Good Friday 1964. (The EVOS also occurred on Good Friday, 25 years later.) The Alutiiq families of Port Graham and Nanwalek on the southern tip of Cook Inlet are descended from inhabitants of several small villages in this area (such as Yalik and Nuka Bay). Nanwalek itself was the site of the first permanent Russian settlement on Alaska's mainland, called Alexandrovsk (founded in 1785), while the present community of Port Graham originated in 1912 with the construction of commercial fish processing facilities there (Stanek 1985:41,45-46). Old Harbor on Kodiak Island was established by early Russian traders in 1794, while Ouzinkie was founded in the 19th century as a retirement community for employees of the Russian-American Company. Larsen Bay and Karluk are the sites of ancient Alutiiq settlements. Akhiok has been occupied since at least the 19th century. Port Lions, like Chenega Bay, owes its origin to the 1964 earthquake, when the village of Afognak was destroyed. By 1965, survivors had resettled at Port Lions. On the Alaska Peninsula, Chignik Bay and Chignik Lagoon are the sites of prehistoric settlements. The community of Chignik Lake was founded in the 1950s by Alutiiq families who had formerly used the area seasonally; they originally came from local villages such as Chignik Lagoon, Kanatak, and Ilnik. Similar to Chenega Bay and Port Lions, Perryville's founding was the consequence of a natural disaster. The community was settled in 1912 by families whose villages of Katmai and Douglas were destroyed in a volcanic eruption. Finally, Ivanof Bay was founded in 1965 by families originally from Perryville and Chignik Lake.

MAJOR STUDIES OF THE SOCIOCULTURAL EFFECTS OF THE OIL SPILL

Table I-1 lists several summary statements about oil spill effects on subsistence uses in the years immediately following the spill stemming from some of the major studies. These are treated in this report as research questions for examination. There are several emphases and points of view within this corpus of research.

The *Exxon Valdez* Oil Spill Trustee Council (EVOSTC)

The EVOSTC consists of representatives of three federal and three state agencies. It administers funds from the settlement of claims by the United States and the State of Alaska against Exxon for natural resource injuries caused by the spill (see Chapter Six). Because of its powerful role as a source of funding backed by the federal and state governments, the Trustee Council's summaries of spill injuries approximate "official" positions on the spill's effects and the status of recovery. According to the restoration plan adopted in 1994, the Trustee Council's restoration program takes "an ecosystem approach" which "includes the entire community of organisms that interact with each other and their physical surroundings, including people and their relationship with other organisms" (EVOSTC 1993a:10).

Table I-1: Some Major Hypotheses about the *Exxon Valdez* Oil Spill's Sociocultural Effects

Division of Subsistence Hypothesis: Uncertainty about the Safety of Subsistence Foods

"The *Exxon Valdez* Oil Spill provides a prime example of the consequences of a major environmental and industrial disaster for the traditional subsistence-based ways of life of Alaska's rural communities. . . In the year after the spill, subsistence harvests in 10 communities in the spill area decreased by as much as 77% compared to pre-spill averages. The range of resources used for subsistence declined by half. In addition, the average number of resources that households attempted to harvest and that they received from other households dropped substantially, indicating reduced subsistence harvest efforts and effects on traditional sharing patterns. . . The primary reason that interviewed households gave for reductions in subsistence harvests was concern that resources had been contaminated by the oil. This concern undermined people's confidence in their own abilities to discern if foods were safe to eat using traditional knowledge. . . Subsistence harvests and uses rebounded in the second and third postspill year. . . [But] . . . concerns about the long-term health risks associated with subsistence foods, as well as concerns about spill effects on the resource populations upon which subsistence uses depend, persisted. Although evidence was found of recovery of subsistence uses after the severe reductions of 1989, this evidence must be qualified in that many households returned to using subsistence foods, despite misgivings, because of economic and cultural reasons" (Fall and Field 1996:834-835).

Alaska Native Class Hypothesis: "A Culture and People Damaged"

"The oil spill ripped the fabric of the Alutiiq community by damaging the core elements: first the natural resources (the material foundation of Alutiiq culture) and with it, the subsistence harvest. Damage to subsistence harvests in turn had detrimental implications for kinship, the institutional foundation. This upheaval also damaged the third core element of the subsistence system, the individual people, by taking away the means by which they derive order and meaning from their lives and introducing uncertainty and confusion" (Braund & Associates 1993:106).

Wooley and Bohannon [Exxon experts] Hypothesis: The Oil Spill as "C-Day" and "Scapegoat"

". . . put into the context of socioeconomic change and adjustments to past social disasters that the Alutiiq people have experienced, the *Exxon Valdez* oil spill was not a determinant event. Its chief distinguishing characteristic is that blame could be attached and lawsuits filed, causing problems that the oil spill itself never could have caused. The spill could thus become the scapegoat for many of the changes in the Alutiiq environment (physical and cultural) that have occurred in the twentieth century" (Wooley 1995:148-149; cf. Wooley and Bohannon 1994:28).

[continued]

Table I-1: [continued] Some Major Hypotheses about the *Exxon Valdez* Oil Spill's Sociocultural Effects

Social Indicators (J. Jorgensen) Hypothesis: Culturally-Mediated Responses to the Spill

"Without question, native subsistence economies in 1989, immediately prior to the spill, were different from native subsistence economies of 1889 and 1789 and 1689 in the technology, the speed and risks with which resource could be harvested, and the proportion that wild foods contributed to the diets. But in 1989, as in the three centuries that preceded it, subsistence economies were directly linked to procuring food and shelter for the maintenance of life. . . I will demonstrate how native customs were invoked as a response to the spill and how nonnatives responded to the spill as well. The differences were marked. The differences are cultural (Jorgensen 1995b:4). . . Immediately after the spill and continuing into early 1990, non-Natives increased their harvests and uses of wild resources. Natives decreased their harvest and relied upon preserved foods harvested before the spill. By the winter of 1991, non-Natives had reduced their harvests and the amounts of wild foods that they ate. Natives had begun to resume more fully their harvesting activities. The proportions of wild foods in their diets remained below the proportions in 1989" (Jorgensen 1995a:8).

"Oiled Mayors Study" Hypothesis: A "Dose-Response" Relationship

"A progressive 'dose-response' relationship was found between exposure to the oil spill and subsequent cleanup efforts and the following variables: reported declines in traditional social relations with family members, friends, neighbors and coworkers; a decline in subsistence production and distribution activities; perceived increases in the amount of and problems associated with drinking, drug abuse, and domestic violence; a decline in perceived health status and an increase in the number of medical conditions verified by a physician; and increased post-spill rates of generalized anxiety disorder, post-traumatic stress disorder, and depression. Alaskan Natives, women, and 18-44 year olds in the high- and low-exposed groups were particularly at risk for the three psychiatric disorders following the oil spill. The results suggest that the oil spill's impact on the psychosocial environment was as significant as its impact on the physical environment " (Palinkas et al. 1993:10).

***Exxon Valdez* Oil Spill Trustee Council Hypothesis: An Injured Natural Resource Service**

"Subsistence harvests of fish and wildlife in most of these [15 predominantly Alaska Native communities in the oil spill area] declined substantially following the oil spill. The reasons for the declines include reduced availability of fish and wildlife to harvest, concern about possible health effects of eating contaminated or injured fish and wildlife, and disruption of lifestyles due to clean-up and other activities. . . Subsistence users say that maintaining their subsistence culture depends on uninterrupted use of fish and wildlife resources. The more time users spend away from subsistence activities, the less likely that they will return to these practices. Continuing injury to natural resources used for subsistence may affect ways of life of entire communities. There is particular concern that the oil spill disrupted opportunities for young people to learn subsistence culture, and that this knowledge may be lost to them in the future" [EVOSTC 1996a:20).

The Trustee Council views injuries to subsistence uses as an extension of injuries to natural resources. Consequently, restoration of subsistence uses is approached indirectly through restoration of the natural resources themselves. There is in this approach an implicit denial that addressing the sociocultural effects of the spill directly has a place in an “ecological approach” to oil spill restoration.

<u>Alaska Department of Fish and Game, Division of Subsistence</u>

The Division of Subsistence, ADF&G, had conducted baseline research in each of the Alaska Native communities before the oil spill, including at least one comprehensive household survey. (See Fall [1990] for a description of the Division’s research procedures.) After the spill, systematic research continued to document subsistence activities and other economic and demographic characteristics in selected study communities. Study communities and study years are reported in Table I-2. This work was funded by ADF&G, the US Fish and Wildlife Service (USWFS), MMS, and the EVOSTC. Major summaries of the findings from these studies include Fall (1991a, 1992, 1995a, 1996, 1999a, 1999c), Fall et al. (1995), Fall and Field (1996), Fall et al. (1996), Fall and Utermohle (1995, 1999), Mishler and Cohen (forthcoming), and Stanek (forthcoming).

The ADF&G studies demonstrated substantial measurable impacts on subsistence harvests, participation, and sharing, among other things, that appear linked initially to a loss of confidence in the safety of subsistence foods, with implications for the mixed subsistence-cash economies and ways of life in the communities. Findings of this research are discussed in detail in Chapter Six. Some of the major study findings included the following:

- In the year after the spill, subsistence harvests declined from 9 percent to 77 percent in 10 Alaska Native communities of Prince William Sound, lower Cook Inlet, and the Kodiak Island Borough. Sharing of resources was reduced, and the transmission of skills and knowledge about natural resources was disrupted.
- Initially, the primary reason for this decline was subsistence users’ fear that oil contamination had rendered the resources unsafe to eat. The primary reason for lower harvests and uses later shifted to perceived declines in populations of subsistence resources.
- Subsistence harvest levels and participation in subsistence activities rebounded somewhat after the first two post-spill years. There was a geographic pattern to post-spill changes in subsistence harvests and uses, with recovery taking place first in communities most distant from Prince William Sound.
- Effects of the spill which persisted at least into 1994 included concerns about the long-term human health effects of using resources from the spill area; a loss of confidence in

Table I-2. Study Communities and Coverage by Major Post *Exxon Valdez* Oil Spill Study[1]

Community[2]	Population 1990	Population 1995	Major Study Coverage: "Oiled Mayors"	Social Indicators	Chronic Stress	ADF&G (with study years): Standard Survey Instrument	ADF&G (with study years): Social Effects Questionnaire
Prince William Sound							
Chenega Bay	94	96	X			1984/85, 1985/86, 1989/90, 1990/91, 1991/92, 1992/93, 1993/94, 1997/98	1991/92, 1992/93, 1993/94
Cordova	2,110	2,568	X	X	X	1985, 1988, 1991, 1992, 1993, 1997/98	1991, 1992, 1993
Tatitlek	119	124	X	X		1987/88, 1988/89, 1989/90, 1990/91, 1991/92, 1993/94, 1997/98	1991/92, 1993/94
Valdez	4,068	4,469	X	X	X	1991, 1992, 1993	1991, 1992, 1993
Cook Inlet							
Kenai	6,327	7,006	X	X		1982, 1991, 1992, 1993	1991, 1992, 1993
Nanwalek	158	162	X			1987, 1989, 1990/91, 1991/92, 1992/93, 1993/94, 1997/98	1991/92, 1992/93, 1993/94
Port Graham	166	170	X			1987, 1989, 1990/91, 1991/92, 1992/93, 1993/94, 1997/98	1991/92, 1992/93, 1993/94
Seldovia	459	415	X	X		1982, 1991/92, 1992/93, 1993/94	1991/92, 1992/93, 1993/94
Kodiak Island Borough							
Akhiok	77	80	X			1982, 1986, 1989, 1992/93	
Karluk	71	58	X	X		1982, 1986, 1989, 1990/91, 1991/92	1991/92
Kodiak City	6,365	7,620	X	X		1982, 1991, 1992, 1993	1991, 1992, 1993
Larsen Bay	147	130	X			1982, 1986, 1989, 1990/91, 1991/92, 1992/93, 1993/94, 1997/98	1991/92, 1992/93, 1993/94
Old Harbor	284	310	X	X		1982, 1986, 1989, 1991/92, 1997/98	1991/92
Ouzinkie	209	259	X			1982, 1986, 1989, 1990/91, 1991/92, 1992/93, 1993/94, 1997/98	1991/92, 1992/93, 1993/94
Port Lions	222	233	X			1982, 1986, 1989, 1993/94	
Alaska Peninsula							
Chignik	188	141	X	X		1984, 1989, 1991/92	1991/92
Chignik Lagoon	53	65	X			1984, 1989	
Chignik Lake	133	154	X			1984, 1989, 1991/92	1991/92
Ivanof Bay	35	28				1984, 1989	
Perryville	108	104				1984, 1989	
Arctic							
Kaktovik	224	210		X		1985/86, 1986/87, 1992/93	
Kivalina	317	349		X		1982/83, 1983/84, 1992	1992
Kotzebue	2,751	2,947		X		1986, 1991	1991
Nuiqsuit	354	410		X		1985/86, 1993	1993

[1] Major references for these studies: "Oil Mayors": IAI 1990abcd; Social Indicators: Jorgensen 1995b; Chronic Stress: Picou and Gill 1996; ADF&G: Fall and Utermohle 1995, 1999.

[2] ADF&G studies for Kodiak in 1982 and 1991 included the road system outside the city limits "Seldovia" population = "Alaska Native Village statistical area," including the city limits and areas connnected by road to the incorporated area.

individuals' abilities to judge if resources were safe to eat; scarcity of certain injured subsistence resources such as harbor seals, marine invertebrates, and waterfowl; increased costs associated with subsistence harvests; and reduced opportunities for young people to learn the subsistence way of life.

The “Oiled Mayors Study”

This study was funded by the Alaska Department of Community and Regional Affairs (ADCRA) through a grant to the “oiled mayors subcommittee” of the Alaska Conference of Mayors. The contract to conduct the research was awarded through a competitive process to Impact Assessment, Inc. The study was conducted from December 1989 through November 1990 in 22 communities throughout the spill area. The goal was “to investigate the types and range of social, economic, and psychological impacts resulting from the oil spill and cleanup” (Russell et al. 1996:869). Major summaries of this study’s findings include Impact Assessment, Inc. 1990a, 1990b, 1990c, 1990d; Palinkas et al. 1992, 1993; and Russell et al. 1996. ADCRA prepared and distributed a brochure presenting the major study findings (ADCRA n.d.).

MMS Social Indicators Project

The MMS-sponsored “social indicators project” was implemented in coastal communities of northern and western Alaska in 1986. It included the administration of questionnaires, key respondent protocols, and ethnographic research. In 1989, the social indicators project was extended to include twelve communities, including nine in the spill area, for two post-spill waves of research. Study findings are reported in an eight-volume final report published by MMS and in several journal articles (e.g., Jorgensen 1995a, 1995b, 1996a, 1996b). A primary finding of the post-spill Social Indicators research was that there were marked differences between Native and non-Native responses to the spill that can be accounted for by pre-spill cultural differences.

Study of Chronic Psychological Stress in Cordova and Valdez

This study was funded by the National Science Foundation, with supplemental funding from Earthwatch and the Center for Field Research. The principal investigators were J. Steven Picou (University of South Alabama) and Duane Gill (Mississippi State University). The goal of the research was to evaluate the long-term psychological impact of the spill in terms of community structure and resource-based stress responses. Study communities were Cordova, Valdez, and Petersburg (control). Major publications include articles by Picou and Gill (1996), by Dyer et al. (1992) and by Dyer (1993). This research continues to date. Some of the major findings include the following:

- Residents of communities of the EVOS area displayed higher levels of stress than residents of communities outside the area
- Within the EVOS region, residents of "renewable resource communities" (e.g., Cordova) displayed higher levels of stress than residents of "nonrenewable resource communities" (e.g., Valdez).
- People who worked in commercial fishing occupations displayed higher levels of spill-related stress than those who worked in other occupations.

Litigation Studies

The attorneys for the Alaska Native Class in the litigation against Exxon hired an Anchorage-based anthropological consulting firm, Stephen Braund and Associates, to compile information about the sociocultural effects of the spill on Alaska Native people. The final report was based on summaries of other studies as well as interviews in spill area communities. As with the MMS Social indicators Study, the Alaska Native Class experts approached the spill's effects on subsistence uses within a broad sociocultural context. The Alaska Native Class attorneys also employed an environmental consulting firm to develop an overview of natural resource damage assessment (NRDA) studies to identify impacts to subsistence (ICF Technology Incorporated 1993). The final report described the following impacts:

- uncertainty concerning the availability and wholesomeness of key subsistence resources;
- reduced availability of many subsistence species; and
- reduced efficiency in subsistence harvesting activities because resources of smaller individual size were harvested in reduced amounts during each harvest effort.

The report concluded that the persistence of oil in the environment, such as in mussel beds, would likely continue to harm resources and retard biological recovery. In addition to reduced subsistence harvests, the study suggested that these biological impacts could be linked to non-natural resource aspects of subsistence use, including nutrition, sharing, cultural knowledge, and social organization.

The defendant in the litigation, Exxon, employed anthropologists as experts to assess sociocultural aspects of the EVOS (Wooley 1995; Wooley and Bohannon 1994). Because of the ongoing litigation, the experts did not conduct fieldwork. They concluded that the spill had no important long-term implications for the culture and way of life of the communities of the spill area, to a large extent because the culture of these communities had already changed so much from "traditional" patterns. According to this view, the spill might become a "C [Change] Day" which could be cited as the cause of changes asserted to have been occurring for decades. As such, the spill could become a "scapegoat" for certain sociocultural changes suffered by Alaska Native communities.

Other Studies

In the first few months following the spill, the Alaska Native non-profit organization for the Chugach Region (then called The North Pacific Rim, later renamed Chugachmiut), employed an independent Anchorage-based anthropologist to conduct research on its behalf. Although several draft reports were produced, only a brief summary overview of this work has been published (Davis 1996). The article stresses the endurance and "resilience" of Alutiiq communities in the face of natural and man-made disasters. It also asserts that litigation prevented a full understanding of how the Alutiiq communities responded to, and recovered from, the EVOS. Araji (1992) was a study of effects of the EVOS on Homer, a Kenai Peninsula community not part of this research.

MAJOR COMPONENTS OF THE PRESENT STUDY

ADF&G prepared the design for this project in response to a request for a proposal from MMS (Fall, Utermohle, and Wolfe 1995:2). The study's major goals were (1) to analyze and integrate subsistence, economic, and sociocultural time-series data from two previous cooperative agreements between MMS and ADF&G (Cooperative Agreements No. 30539 and No. 30622); (2) to provide comparative data analysis within and among Alaska's OCS planning areas; (3) to provide unique information about socioeconomic change at the household and community levels for EVOS-affected communities; (4) to cooperate with state and federal agencies and community and regional organizations in assessing the occurrence and implications of documented sociocultural change; and (5) to implement effective communication of study results to local communities and regional organizations.

Seven tasks and a set of associated deliverables were formulated to meet these goals. The relationship between the tasks and deliverables, along with the repository for products, is depicted in Table I-3. Following is an overview of each project task.

> Task 1 was the creation of an SPSS metafile of community survey information previously collected by ADF&G data and organized under two earlier cooperative agreements (14-35-001-30539 and 14-35-0001-30622). The three phases were 1) defining the content of the household-level database, 2) creating the database using summary variables, and 3) compiling three different compositions of the household-level data sets to be used as input for analysis in Task 3, the time series analysis. As noted earlier, the cooperative agreement was amended to support the addition of data from another round of household interviews conducted in 1998 as part of an EVOS restoration project. Comprehensive metafiles were submitted to MMS in April 1999 as Technical Memorandum-1 (TM-1).

Table I-3. Project Tasks, Deliverables, Repositories of Products, and Citations

Task #	Task Name	Deliverable[1]	Repository	Citation
1	Creation of SPSS metafile of community survey data	TM-1. ADF&G SPSS Metafiles	ADF&G	
2	Literature review	TM-2. Annotated Bibliograpy and Integrative Overview	ADF&G	
3	Time-series analysis of ADF&G datasets	TM-3. Time Series Analysis; also Included in final report (see Task 7)	ADF&G	
4	Ethnographic case studies	TM-4. Valdez Report	ADF&G	Fogarty et al. 2000
		TM-5. Tatitlek/Chenega Bay Ethnography	ADF&G	Simeone and Miraglia 2000
		TM-6. Cordova Report	ADF&G	Kenner 2000
		TM-7. Old Harbor/Ouzinkie Ethnography	ADF&G	Mishler 2001
		TM-8. Nanwalek/Port Graham Ethnography	ADF&G	Stanek 2000
5	Oral histories	TM-10. Pre-Fieldwork Plan for Oral History and Ethnography Tasks	ADF&G	
		TM-9. Post-Fieldwork Summary of Oral History Task	ADF&G	
		Chenega Bay Jukebox	ADF&G	
		Tatitlek Jukebox	ADF&G	
		Nanwalek/Port Graham Jukebox	ADF&G	
6	Creation of GIS database and map products	GIS database[2]; map products in jukeboxes, ethnographies, and final report	ADF&G	
7	Final report	OCS Study MMS 2001-032	MMS	Fall et al. 2001 (this report)

[1] TM = Technical Memorandum; the numbering system here differs from that in the project proposal and cooperative agreement.

[2] GIS Database was largely developed through a cooperative agreement with the US Fish and Wildlife Service.

Task 2 consisted of a review of literature addressing EVOS and other socioeconomic studies as they relate to understanding the relationships among such factors as subsistence activities, local cash economies, and the welfare of the communities in the spill area. The goal of the literature review was to identify a set of hypotheses about the long-term consequences of the spill which could be examined through analysis of the data base developed under Task 1, and/or that could be further investigated through key respondent interviews, other ethnographic research, and other investigations. This effort resulted in an annotated bibliography. A technical memorandum (TM-2) included findings from the literature review task.

Task 3 was a time-series analysis of the ADF&G data sets, using the database developed under Task 1 and guided by the hypotheses identified under Task 2. Theoretical background for this task is further described in Chapter Two. TM-3 included results of the time-series analysis, which are also discussed in this report.

Task 4 consisted of ethnographic case studies and key respondent interviews. Five ethnographic case studies were conducted: Valdez (TM-4) (Fogerty et al. 2000), represents "non-subsistence-based" economies and societies; the couplets Tatitlek-Chenega Bay (TM-5) (Simeone and Miraglia 2000), Port Graham-Nanwalek (TM-8) (Stanek 2000), and Ouzinkie-Old Harbor (TM-7) (Mishler 2001) represent mixed subsistence economies and Alaska Native communities; and Cordova (TM-6) (Kenner 2000), represents rural communities or "hubs," larger, more culturally-heterogeneous commercial fishing based settlements. Development of the ethnographies was guided by a topical outline and a series of workshops that identified key respondent topics.

Task 5 consisted of the planning, development, and distribution of a series of oral histories from Alaska Naïve elders and other knowledgeable people. The project used techniques developed by the University of Alaska's Project Jukebox, an interactive, multi-media computer system that preserves oral histories and associated photographs, maps, and texts. The content and themes of the oral histories were developed in two workshops and in meetings in the study communities. TM-10 describes the procedures for coordination of this effort and TM-9 is a post-fieldwork overview of the Jukebox production and contents. The four communities for which three jukeboxes were produced were Tatitlek, Chenega Bay, Nanwalek, and Port Graham. The latter two communities were combined in a single product.

Task 6 was the creation of a geographic information system (GIS) database to support the development of the ethnographic case studies and the final report. This task was supplemented through another cooperative agreement with the USFWS.

Task 7 was the production of this report, which is intended to be a comprehensive, integrative, and comparative analysis drawing upon all of the project's quantitative and qualitative data sets, ethnographic case studies, oral histories, and secondary source materials.

ORGANIZATION OF THE REPORT

Because it deals with continuity and change in sociocultural systems, the report is organized chronologically. The following chapter provides a theoretical basis for the overall analysis. Chapter Three describes the Pacific Gulf region at "historic contact" between Alutiiq and Euroamerican groups. Major historical processes in the Pacific Gulf up to the oil spill are described in Chapter Four, including changes in demography, economy, religion, education, political systems, and natural resources. Chapter Five provides a "snap shot" of the Pacific Gulf region on the "eve" of the oil spill, and Chapter Six describes the oil spill itself. Chapters Seven and Eight describe the responses of households and communities to the oil spill, including economic, cultural, and political processes. The analysis covers the first ten years following the spill. Chapter Nine provides an assessment of these changes in light of the larger research question of how the oil spill fits into the history of sociocultural continuity and change in the Pacific Gulf region.

Chapter Two: Adaptation, Culture, and Human Groups in the Pacific Gulf: Theoretical Issues

"Theories about disasters are inherently about communities, that is, community continuity and change" (Torry 1979:43).

This chapter provides the theoretical underpinnings of this report. It describes the primary theoretical constructs and research questions that serve as the focus of inquiry. The theory underlying this analysis derives from sociocultural anthropology. Major theoretical constructs include adaptation, culture, social groups (including households, indigenous cultural groups, and community types), socioeconomic systems, and human adaptive responses. Each of these constructs is defined below with related research questions.

ADAPTATION AND CULTURE

Common to most anthropological theory is the concept of human adaptation. This construct is central to the following analysis of the oil spill in the Pacific Gulf of Alaska. Compared with other animal populations, human groups have evolved a capacity to flexibly adapt to a wide range of environments and environmental challenges. By environment we mean not just natural (physical) environments, but also social environments impinging upon human groups, including other groups, ideas, technologies, and sociopolitical systems. The adaptability of human groups primarily derives from "culture," which is defined in this report as patterned ideas, activities, and technologies that are learned and shared within and across human groups. Cultural patterns that enable human groups to survive and prosper may display great continuity through time. They are the traditions that are passed on across generations. While cultural patterns commonly show persistence and continuity, humans continually adjust culturally patterned ideas, activities, and technologies in response to new challenges from the natural and social environments. Culture change is the rule in human groups, because over time, new environmental challenges stimulate innovation and change. Changes in culture that promote survival and prosperity of human groups are called positive adaptations in anthropological theory. Positive adaptations are measured by the social reproduction of a human group. Maladaptive responses to environmental challenges are measured by the difficulties of human groups to reproduce and prosper.

One central research question explored in this report is, <u>how did human groups adapt to the *Exxon Valdez* Oil Spill</u>? Note that this is a very different question from "what were the impacts of the spill on human groups", or "what were the damages?" The construct of "impacts" (a metaphor from physics) evokes images of something striking something and leaving residual effects. For human groups, the question of "what were the impacts" is overly simplistic, as it omits the essential active response of impacted human systems. Accordingly, the central research question of this study is "how did human groups adapt to the industrial disaster," recognizing that human groups actively respond to disasters, making changes from the routine to deal with external environmental threats.

As stated above, the primary channels of adaptive change for human groups are usually cultural, including changes made in activities of families, networks of families, communities, networks of communities, and other social organizations. There are a number of types of cultural responses – technological (such as employing booms, skimmers, pressure hoses, and dispersants), demographic (moving people in, out, and around the spill area), economic (adjusting production and distribution of goods and services), organizational (activating and creating social entities for communication and coordination), legal (instituting suits for compensation of injuries), and so forth. The relative success of responses like these can be measured afterward by the extent to which particular human groups have endured, socially reproduced, and prospered.

A second general research question explored in this report is, <u>were responses to the spill primarily short-term changes, or long-term changes for human groups?</u> Another way to pose this question is this: <u>has the spill significantly altered the course of history for human groups in the Pacific Gulf of Alaska?</u> As illustrated by some early post-spill appraisals in Chapter One, there have been some divergent opinions on this question, from the spill as a major shaper of cultural traditions in Native villages (Woestendiek 1991), to the spill as a minor, non-determinant event in the history of the Pacific Gulf groups (Wooley 1995; Wooley and Bohannon 1994). If human groups are pre-adapted to flexibly deal with novel environmental challenges, one might predict that responses might be short-term – response mechanisms were activated, applied, and deactivated, with life patterns returning to normal after the spill. On the other hand, substantial adjustments in cultural patterns may be required to deal with extreme environmental changes. Reponses to substantially altered ecological and social environments may evoke permanent changes within human groups. At times, human groups fail to adapt to severe challenges, such as virulent introduced diseases, the arrival of militant oppressors, or the severe degradation of a local ecological system. After a struggle to cope, human groups can diminish and disappear. In the case of the *Exxon Valdez* Oil Spill, what in fact did happen? To what extent have the histories of human groups in the Pacific Gulf been changed because of the oil spill?

HUMAN GROUPS IN THE PACIFIC GULF

A central theoretical construct is that of a "human group." Adaptations to disasters generally are collaborative efforts involving multiple persons. Humans adapt as members of human groups and more rarely as individuals separate from human groups. Social roles are activated within human groups. Persons do their parts in a group response. A variety of human groups responded to the *Exxon Valdez* oil spill, including business corporations (such as Exxon Corporation and Alyeska Corporation) and government entities (such as the U.S. Coast Guard, Alaska Department of Environmental Conservation, and the Oil Spill Trustee Council). Business and governmental bodies were major players in spill response and restoration. They shaped the social construction of the oil spill, what it meant, and what were considered appropriate responses. These groups allocated millions of dollars in spill response and coordinated the activities of thousands of people.

Within this massive social response were the individual and collective actions of the residents of the Pacific Gulf of Alaska. This report will focus on this latter group – the human groups resident in the spill area -- and their part in the responses to the spill event. The study will focus on three types of resident groups: cultural groups, household-level groups, and communities. The taxonomy of human groups used in the analysis is presented in Fig. II-1. Each type is briefly described below.

Cultural Groups

The Alutiiq of the Pacific Gulf provide the focus for this report. The central research question is, how did the Alutiiq adapt to the oil spill? The Alutiiq are one of three Alaska Native groups in the Gulf of Alaska, alongside the Eyak (who primarily reside in Cordova with some Alutiiq and Tlingit residents) and the Dena'ina (who primarily reside in the Cook Inlet communities of Tyonek, Knik, Eklutna, Seldovia, and Kenai) (see Fig. II-1). The Eyak and Dena'ina, as cultural groups, are not a focus of the report.

As used in this report, Alutiiq should be understood to be a social construct identifying a human group tied together by culture and history. The term, "Alutiiq" identifies the principal cultural group indigenous to the Pacific Gulf. Alutiiqs are persons whose ancestors predate historic contact in the Pacific Gulf region. Alutiiq also refers to the regional Eskimoan dialect historically spoken by the indigenous population within the Pacific Gulf (see Chapters Three and Five). Like many regional designations for Native American groups used by cultural anthropologists, the name identifies an indigenous population dispersed among several villages who under ordinary circumstances are not organized into a single social unit. It describes a group of persons unified by commonalities of culture and historic circumstance. During the late 1990s, the Alutiiq used several terms of self-reference, including "Aleut," "Alutiiq," "Sugpiat," and the more general term, "Alaska Native" (see Chapter Three). During the late 20th century, there were certain benefits for being identified by these social terms, including political, educational, health, and economic entitlements through tribal affiliation and shareholder status in Native corporations. Above the level of family, the Alutiiq were organized into 22 federally-recognized tribes, three regional non-profit organizations, and four regional profit organizations (see Chapter Five).

As shown in Fig. II-1, the main non-Native cultural groups historically or currently residing in the spill area include the Russians (circa 1780s to 1867) and Euroamericans (after 1867). A few other cultural groups also have been residents, including the Chinese (as cannery workers during the late 19th century), Filipinos (after the early 20th century), Hispanics (during the late 20th century), and a few others. Non-Native groups migrated into the Pacific Gulf region in several separate waves. Chapter Four

Figure II-1. Human Groups Historically Present in the Pacific Gulf of Alaska
(Taxonomic Categories Used in Analysis)

Cultural Groups								
Alaska Native			Non-Native					
Alutiiq	Eyak	Dena'ina	Russian	Euro-American			Other	
(Koniag, Unixkugmiut, Chugach, Peninsula)				1st wave (circa 1867-90s)	2nd wave (circa 1940s)	3rd wave (circa 1970s-80s)	Filipino	Hispanic

Community Groups							
Villages			Towns			Cities	
Near Spill	Mid-Distant	Distant	Kodiak City	Cordova	Seldovia	Valdez	Kenai
(PWS-LCI)*	(Kodiak Island)	(Alaska Penin.)					
Chenga Bay	Ahkiok	Chignik Bay					
Tatitlek	Karluk	Chignik Lagoon					
Pt Graham	Larsen Bay	Chignik Lake					
Nanwalek	Old Harbor	Ivanof Bay					
	Ouzinkie	Perryville					
	Port Lions						

* Prince William Sound-Lower Cook Inlet

Household-Level Groups								
Extended Family A			Extended Family B			Extended Family C		Etc.
Household No. 1	Household No. 2	Household No. 3	Household No. 4	Household No. 5	Household No. 6	Household No. 7	Household No. 8	Household No. 9

identifies three distinct waves of Euroamerican migrants – early territorial (circa 1867-90s), World War II (circa 1940s), and oil boom (circa 1970s-80s). The new immigrants brought new cultural patterns, including new languages, economic systems, religious practices, and political structures. By the late 20th century, most non-Natives resided in the towns and cities of the Pacific Gulf (Kodiak City, Valdez, Seward, Cordova, Seldovia, and Whittier), demographically separate from the Alutiiq villages.

The term, "Euroamerican" identifies the largest cultural group currently residing in the Pacific Gulf. Euroamericans are persons with ancestral ties to Europe (principally northern Europe and Scandinavia) arriving in the Pacific Gulf region during the American period (after 1867). Like the term, "Alutiiq," it describes a group of persons unified by commonalities of culture and historic circumstance. Euroamericans in the Pacific Gulf did not use this term for self-reference during the late 20th century. Most Euroamericans referred to themselves as "Alaskans" or "Americans" or "Whites," or nothing at all (as discussed in Chapter Four, other terms like "Americanski," "Yankee," or "Boston Men" were used in the late 19th century, though these terms are not common today). "Non-Native" was a term only occasionally used by Euroamericans to distinguish themselves from the indigenous population.

Through historic human migration, there has been a layering of cultural traditions in the Pacific Gulf. Cultural groups have been mutually influenced, through borrowing, syncretism, domination, and replacement of ideas and practice. But even into the late 20th century, Alaska Natives and non-Natives in the Pacific Gulf had maintained separate identities, relatively separate settlement patterns, and distinctive ways of life. This report will examine how the Alutiiq responded to the oil spill as a distinct cultural group in the Pacific Gulf.

Household-Level Groups

The second type of group analyzed in this report is the "household." A household is defined in this report as a residency unit. A household is all persons reported to be living within a dwelling. The household was a fundamental social unit in the Pacific Gulf. Households typically comprised a group of persons closely tied by kinship. It was typically a commensal unit -- its members regularly consumed from a common store of food and used a common set of material possessions. Functionally, primary activities of the household were marriage relations and child rearing, including the socialization of children into family traditions. The household was a fundamental unit for the social reproduction of the larger cultural group. As will be shown in later chapters, another primary activity of households was economic. Households were major economic firms in the production, distribution, and consumption of wild foods in Alaska Native villages. This economic organization of the subsistence sector is termed a "domestic mode" of production and distribution, in reference to its family-based organization.

In economic and social activities, households were frequently linked together to form multi-household, extended family groups, as shown in Fig. II-1 (see also Chapter Five). Bilateral kinship relationships were commonly used to link households into larger networks. The extended family group was most common in Alutiiq villages, where multi-generational families were prevalent. The extended family group was the central social unit for Alaska Native villages during the 20th century, with greater practical importance for many Alaska Natives than any other tribal, corporate, national, or religious affiliation. A person's primary roles in life were established by the needs of one's extended family. A primary goal in life was the social reproduction and prosperity of one's extended family group (cf. Jorgensen 1996a:20, 1996c:20-21).

Extended family networks were less common in predominately non-Native towns and cities. Extended family groups were least frequent among newcomers in towns and cities. A lack of family roots in a community worked against establishing inter-generation kinship networks. Households of newcomers displayed greater autonomy and individuation than households linked within extended family networks.

A focal research question for this report was, how did households adapt to the oil spill? For residents of the spill area, adaptive responses to the industrial disaster were frequently mediated through the household and extended family groups. A set of research questions emerges from this line of inquiry. Were certain households more or less vulnerable to disruptions created by the oil spill? Did certain types of households benefit economically from the spill more than other types? How did customary social support mechanisms for providing for dependent households perform during the spill? Did the households of elders and single mothers with young dependent children continue to receive support from other households during the crisis?

Communities

"Communities" are the third type of human group analyzed in this report. Communities are defined here as named settlements with organized local governments (municipal, tribal, or both). For this study, households were surveyed in 20 communities in the oil spill area, listed previously in Table I-2. (Due to budget limitations, some communities in or near the spill area were not surveyed, including Whittier, Seward, and other Cook Inlet communities such as Homer, Ninilchik, Tyonek, and Anchorage.) A primary research question was, to what extent were household responses to the oil spill similar or different between communities, and why? We anticipated that there would be clear, measurable differences between communities in household-level responses to the spill, and that these would be linked to type of community and geographic location.

As a theoretical proposition, we posited three distinct types of communities in the Pacific Gulf as fundamental for understanding the response of households to the oil spill – "villages," "towns," and "cities" (see Figs. II-1 and II-2). A focal research question for this report was, to what extent were household responses to the spill different in "villages", "towns", and "cities"? As shown in Figures II-1 and II-2, two surveyed communities (Valdez and Kenai) were classified as "cities," three surveyed communities (Kodiak City, Cordova, and Seldovia) were classified as "towns," and fifteen surveyed communities were classified as "villages." Nearest the spill center were Chenega Bay, Tatitlek, Port Graham, and Nanwalek (Prince William Sound-Lower Cook Inlet). Mid-distant from the spill center were Ahkiok, Karluk,

Figure II-2. Community Types by Preliminary Socioeconomic and Demographic Features

	Villages: 15 Places*	Towns: Kodiak City, Cordova, Seldovia	Cities: Valdez, Kenai City**
Demographic Characteristics			
Population Size	low	mid-large	mid-large
Growth Through In-Migration	low	high	high
Economic System			
Wage-Market Sector Development	low	moderate	high
Commercial Fishery Development	low-high	high	low
Subsistence Sector Development	high	moderate	low
Wild Food Production (Per Capita)	high	moderate	low
Wild Food Distribution	high	moderate	low
Domestic Mode of Production	high	moderate	low
Sociocultural Characteristics			
Predominant Cultural Group	Native	non-Native	non-Native
Significant Native Population	yes	yes	no
Extended Kinship-Tribal Organization	high	moderate	low

* Prince William Sound-Lower Cook Inlet (4): Chenega Bay, Tatitlek, Port Graham, Nanwalek
Kodiak Island (6): Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, Port Lions
Alaska Peninsula (5): Chignik Bay, Chignik Lake, Chignik Lagoon, Ivanoff Bay, Perryville

** Unsurveyed places included Seward and Whittier

Larsen Bay, Old Harbor, Ouzinkie, and Port Lions (Kodiak Island). Most distant from the spill center were Chignik Bay, Chignik Lagoon, Chignik Lake, Ivanof Bay, and Perryville (Alaska Peninsula).

Community types represent fundamental cleavage planes in the society of the Pacific Gulf during the 20th century. We expected that the typology would prove useful for describing, understanding, and explaining patterns of spill responses by households. As a starting point for analysis, we identified a preliminary set of demographic, economic, and sociocultural features that characterized a given community type, shown as Figure II-2. As a theoretical proposition, we expected that "cities" would display several linked features – high growth from non-Native in-migration, a predominant Euroamerican culture (with minority Alaska Native enclaves), an industrial-capital economy, a highly developed commercial-wage sector, low wild food production and distribution, and a low salience of extended kinship and tribal organizations. We expected "villages" would display a different set of features – low growth from non-Native in-migration, a predominant Alaska Native culture (with minority non-Native enclaves), a mixed subsistence-cash economy, a poorly developed commercial-wage sector, high wild food production and distribution, and a high salience of extended kinship and tribal organizations. The contrasting features of "city" and "village" parallel "urban – rural" and "non-Native – Native" distinctions found in the late 20th century Alaska.

We anticipated that communities in the spill area might prove more complex than two contrasting types. As shown in Figure II-2, we expected that there might be a third grouping of communities, which we labeled "towns." We were less certain about features of "towns," except that along the range of attributes identified above, they might fall somewhere between "village" and "city." We expected that "towns" might display this set of features – moderate-to-high growth from non-Native in-migration, a predominant Euroamerican culture (with minority Alaska Native enclaves), a mixed subsistence-cash economy, a moderately-developed commercial-wage sector, moderate wild food production and distribution, and a low-to-moderate salience of extended kinship and tribal organizations. The features of "towns" may characterize small-to-moderate sized non-Native places with highly developed commercial fishing industries as a core of the commercial-wage sector. This commercial fishing focus might be a defining aspect of "towns" in the Pacific Gulf. A research question was, <u>is there a group of communities ("towns"), which are measurably different from "villages" and "cities"? (see Chapter Five for an analysis of this question).</u> As a preliminary model, the taxonomy in Figure II-2 calls for tests with empirical data. In this report, we examined whether there were statistical differences between the community types and whether features were clustered as expected in the model.

The model in Figure II-2 anticipates the potential effects of geography. There are regional differences between rural villages tied to geography, that is, ecological, historical, and cultural differences linked to place. The proximity of the community to the spill center also was likely related to spill response. A research question was, <u>to what extent were household responses to the oil spill related to a village's geographic proximity to the spill center?</u>

TYPES OF ADAPTIVE RESPONSES

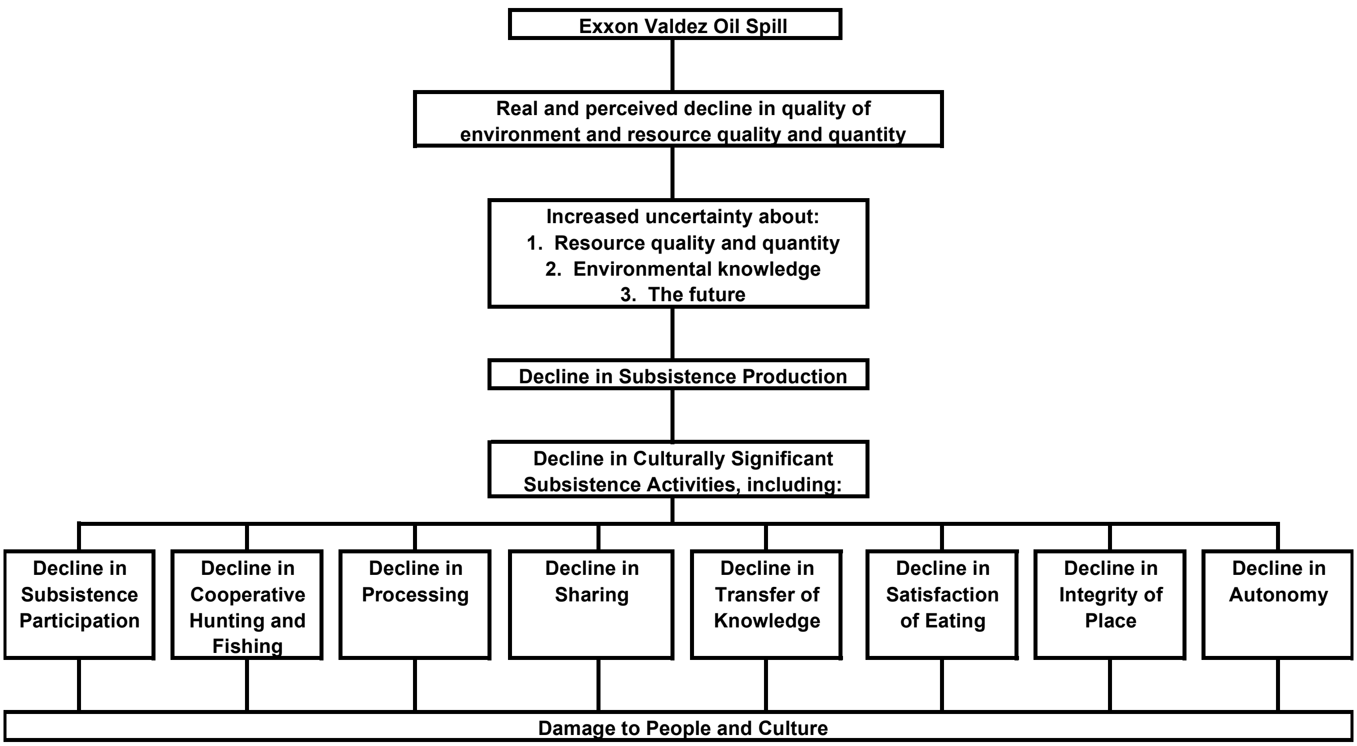
Flexible adjustment to short-term resource perturbations is known to be a common feature of hunter-gatherer economic systems. In northern areas, natural ecological systems commonly display seasonal variations in wild resource availability and procurement conditions. Seasons of scarcity sometimes follow seasons of plenty. Depending on the ecological niche of a hunter-gatherer society, wild food production can display considerable year-to-year variation. Peak herring runs may be followed by several years of low runs; a particularly stormy year may disrupt marine mammal hunting; and so forth. Similarly, in contemporary hunter-gatherer systems, commercial-wage sectors commonly display substantial insecurity. Employment may be seasonal (summer commercial fishing, winter fur trapping) or periodic (construction projects fueled by occasional government capital budgets). Families in subsistence-based villages have developed strategies for dealing with short-term changes caused by natural and economic variation. This flexibility is one reason for the durability of mixed, subsistence-cash economies as an economic system.

Since flexibility is a common feature of subsistence-based economies, one might anticipate that family groups in Alaska Native villages may be pre-adapted for dealing with perturbations associated with an industrial accident like the oil spill. Families might be expected to adapt to disruptions caused by an oil spill using approaches already developed for dealing with change from other ecological and economic sources. It can be hypothesized that families in subsistence-based villages have survived because of long experience with dynamic natural systems. In this sense, the apparent vulnerability of resource-dependent villages to natural resource disruptions may actually be a source of resilience.

Figure II-3 depicts a model of spill effects on subsistence uses and other sociocultural factors, proposed by analysts employed by the Alaska Native Class in litigation to recover damages from the oil spill (Stephen R. Braund and Associates 1993:66). The model traces the links between “real and perceived” changes in the natural environment and changes in subsistence activities (hunting, fishing, processing, and sharing). The declines in subsistence activities are associated with other sociocultural effects experienced by families and communities (decline in transfer of knowledge, decline in satisfaction of eating, decline in integrity of place, and so forth). The model is useful for illustrating linkages between subsistence activities and other parts of community life, and how changes in the natural environment ripple through the community in a cause-effect chain. Figure II-3 is incomplete, however, because it fails to address the commercial-wage sector of the village economy. It also leaves out the ways that human groups adaptively respond to environmental disruptions by adjusting activities.

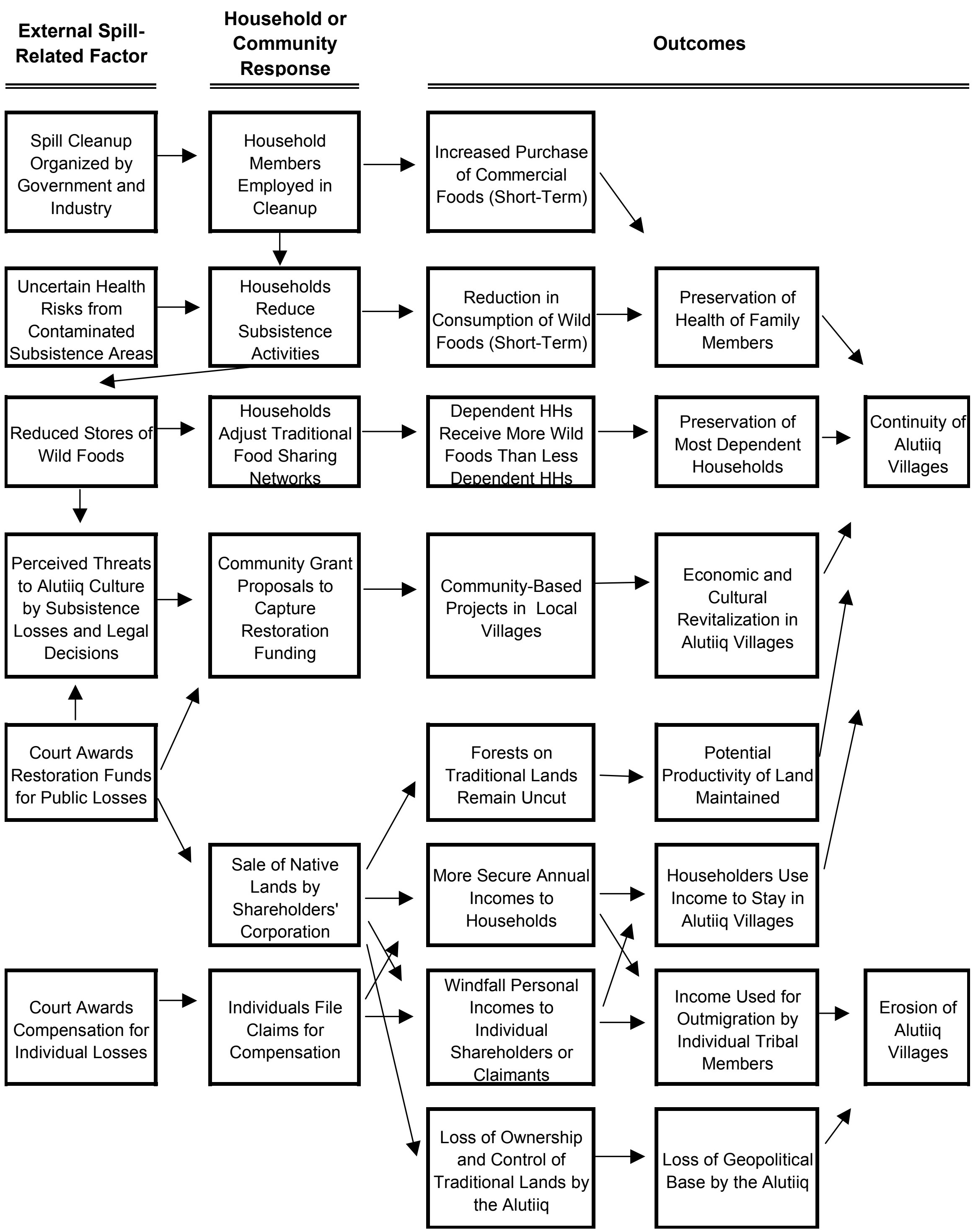
Figure II-4 depicts a second model of spill effects that illustrates these additional components, elaborating Figure II-3. This model is advanced as part of the current study. It lists a number of external, spill-related challenges facing households and Alutiiq communities in the spill area, including food safety

Fig. II-3. A Model of the Exxon Valdez Oil Spill's Impacts on Subsistence, Culture, and People



Source: Stephen R. Braund and Associates 1993:66

Figure II-4. Alaska Native Household or Community Responses and Outcomes to External Oil Spill Factors in Pacific Gulf Alutiiq Villages



questions, employment opportunities in spill cleanup, court decisions, and restoration project money. Groups (households, community governments, and Native corporations) are depicted as responding to these spill-related factors through adjustments in their uses of labor, land, and capital resources. Such responses may have multiple outcomes for the Alutiiq. One potential effect is short-term change in the relative productivity of the subsistence sector vis-a-vis the commercial-wage sector in a community, illustrated in Figure II-4. That is, families reduce subsistence harvests while increasing wage employment activities, or vice versa. Other changes can be in demography, political institutions, community infrastructures, expressive culture, and so forth. The model in Figure II-4 is a more complete model than Figure II-3 because it illustrates the adaptive responses of human groups to environmental change, and how measurable effects emerge from those responses.

We will end this theoretical overview by identifying a few potential adaptive responses to an industrial disaster like an oil spill, illustrated in Figure II-4:

<u>The Mix of Subsistence and Commercial-Wage Sectors in Villages</u>. In the short-term, village households can respond to potential contamination of wild foods from an oil spill by decreasing the production and consumption of wild foods (activities comprising the subsistence sector of the village economy), increasing activity in wage employment (activities comprising the commercial-wage sector of the village economy), and substituting imported commercial foods for locally produced wild foods. This response is examined in Chapter Seven. This household strategy may be feasible if employment opportunities are available, such as employment associated with spill response, but it may not be feasible if there are no such opportunities. In the longer term, village households can once again increase production-sharing-consumption of wild foods in the subsistence sector following a disaster to pre-spill levels, if resources are not degraded and government regulations do not create obstacles or disincentives.

<u>Sharing Among Households in Villages</u>. In the short-term, village households may utilize traditional social support systems to provide for the most dependent households during a food crisis (this response is examined in Chapter Eight). Limited supplies of shared wild foods may be directed to the most-dependent households in a village during a crisis, while sharing of wild foods may decrease overall.

<u>Cultural and Economic Revitalization in Villages</u>. An environmental crisis may stimulate the revitalization of the culture and economy in a village, if monetary resources channeled into a community are used by local governments to integrate and expand the cultural group, rather than divide or individualize members (this response is examined in Chapters Six and Eight). If used effectively, restoration and settlement money hold the potential for revitalizing the Alutiiq culture and the general welfare of people within a community.

Migration. Households may choose to respond to disasters by moving to areas with more favorable prospects (this is discussed in Chapter Four in relation to historic epidemics, Chapter Five in response to the 1964 earthquake and tsunami; and Chapter Nine in relation to the *Exxon Valdez* oil spill). The degree of mobility may be related in part to the capacity and desire by individuals to maintain ties with a particular place or cultural group, weighed against the health, social, and economic problems created by a disaster. Disasters may trigger out-migration by households in particular communities under certain circumstances, leading to the eventual decline of cultural groups.

Monetary Awards. Monetary awards to individuals from settlement or restoration funds (see Chapter Six) may support or erode cultural groups and local villages, depending upon the social cohesiveness of kindred groups prior to the award. The effect of money on the cultural group and community depends on how it is used by members of extended family groups.

Each of these responses is advanced as a theoretical proposition to be examined in the following chapters. In summary, this report will discuss the range and nature of short- and long-term adaptations to the oil spill by three types of human groups in the Pacific Gulf – cultural groups, household-level groups, and communities. The report will explore whether and to what degree Alutiiq villages were successful in adapting to spill-related challenges. The report will assess the extent to which the responses benefited group members and allowed for social groups to continue with traditional lifeways intact. The analysis will be placed in the context of historic change in the Pacific Gulf. To fully understand the human responses to the oil spill, one must first consider the social history preceding the disaster. We begin this historic narrative by describing the Alutiiq society and culture prior to the arrival of Russian and Euroamerican colonists.

Chapter Three: The Alutiiq of the Pacific Gulf At Historic Contact

THE *SUGPIAT* (*ALUTIIQ*)

At the time of direct historic contact in the 1760s, the people living on the east side of the Alaska Peninsula, Kodiak Island, the lower Kenai Peninsula, and Prince William Sound called themselves *Sugpiat* or "the real people." Disregarding aboriginal self-designations, the invading Russians developed their own terms for the Native population. All *Sugpiat* were called "Aleut," from *Aliutor*, a Siberian word used to refer to people living on the coast of the Kamchatka Peninsula (Pullar 1996:19). The native inhabitants of Kodiak Island and the Alaska Peninsula were called "Koniag" or "Koniag Aleut," while Prince William Sound and Kenai Peninsula people became known as "Chugach" or "Chugach Aleut". Through time the terms Koniag and Chugach took hold and were widely used by Native people and anthropologists.

Case III-1. Word Origins.

"Koniag" is an *Unangan* (Aleut) word for the people of Kodiak Island, while "Chugach" is of unknown derivation. Following the Alaska Native Claims Settlement Act in 1971, two regional corporations in the Pacific Gulf area were called Koniag Incorporated and Chugach Alaska Incorporated.

While similarities do exist between Aleutian Island Aleuts, who call themselves *Unangan*, and the *Sugpiat*, there are notable differences in culture and language. The *Sugpiat*, for example, speak *Sugcestun,* a language closely related to *Yup'ik,* an Eskimo language spoken by people in southwest Alaska and St. Lawrence Island. In recognition of this fact, anthropologists call the *Sugpiat* Pacific Eskimo or *Pacific Yup'ik* (Oswalt 1967). However, the *Sugpiat* do not consider themselves Eskimo and do not want to be called Eskimo. Recently some *Sugpiat* have started to call themselves *Alutiiq*, which is simply the word for "Aleut" in Sugcestun, while others want to use *Sugpiat*, which they consider is more appropriate (Pullar 1996:19). We will use the term Alutiiq to refer to the indigenous people and language of the Pacific Gulf region.

Case III-2. Identifiers.

The Russians recognized differences between groups of Native people. In using the word "Aleut" the Russians were not referring to a specific people as much as a distinctive set of cultural identifiers that revolved around the hunting of sea mammals. Such identifiers included baidarkies or kayaks, gut skin clothing, the distinctive bent wood sunshade, and particular hunting weapons such as the throwing board and dart. As a consequence, by the beginning of the 19th century, Alutiiq people were given a collective identity by the Russians based on their ability to hunt sea mammals (Simeone 1992; cf. Pullar 1996:19).

REGIONAL GROUPS

During the 18th century, the Alutiiq people were loosely organized within at least four named regional groups: the *Qikertarmiut* of Kodiak Island, the *Aglegmiut* of the Alaska Peninsula, the *Unegkurmiut* of the Kenai Peninsula, and the *Paluwigmiut* of Prince William Sound (Haggarty et al. 1991:76). It is likely the Alutiiq identified more closely with smaller, local groups or "societies" rather than broadly defined regional groups (Townsend 1980:129). In Prince William Sound there may have been eight societies, each with a territory (cf. de Laguna 1956; Hassan 1978). The Kodiak archipelago may have been home to three or more societies, one on Shuyak Island, another on Afognak, and a third on the main island (Townsend 1980), but the evidence is inconclusive. The *Sugpiat* living on the outside coast of the Kenai Peninsula may have formed a single society (Betts et al. 1991:21).

POPULATION

The size of the pre-colonial aboriginal population is difficult to estimate because of the devastation wrought by European contact (see Chapter Four). But population densities were relatively high for hunter-gatherer groups and conservative estimates suggest a pre-colonial population for the entire region of at least 9,000 to 10,000 people living in about 100 villages (Oswalt 1967:5-9; Haggarty et al. 1991:76; Clark 1984:187). Others believe the population was much higher and estimate that there were at least 10,000, and possibly 20,000 people living on Kodiak Island alone when the Russians established the first settlement in 1784 (Jordan and Knecht 1985; Pullar and Knecht 1990; Crowell 1988:134). The pre-colonial population of Prince William Sound has been estimated from anywhere between 400 and 1,000 (Oswalt 1964:5-9; Haggarty et al. 1991).

Early Russian counts also vary. Shelikhov estimated there might have been 50,000 people on Kodiak Island in 1784. Khlebinkov (1994:6), who served in Russian America from 1818 to 1832, disputes this claim. Citing Baranov's census figure of 5,696 persons collected in 1792, only six years after Shelikov, Khlebnikov writes that it was impossible that "eight-ninths" of the population could "have been exterminated in so short time under any circumstances." But Khlebnikov does concede that the population declined because of "various misfortunes and conditions" (1994:7). By 1833, the Native population residing on Kodiak and adjacent islands reportedly had declined to 2,510 (Wrangell quoted in Khlebnikov 1994:358).

Case III-3. Sources of Mortality.

Khlebnikov (1994:8) lists "unfortunate events which led to the destruction of the Kad'iak Aleuts." These include Kodiak people killed in various fights between the Russian American Company and the Tlingit, *Alutiiqs* who drowned on various company hunting expeditions, 135 Alutiiqs who died from paralytic shellfish poisoning while traveling from Sitka, and an "extreme" epidemic in 1799.

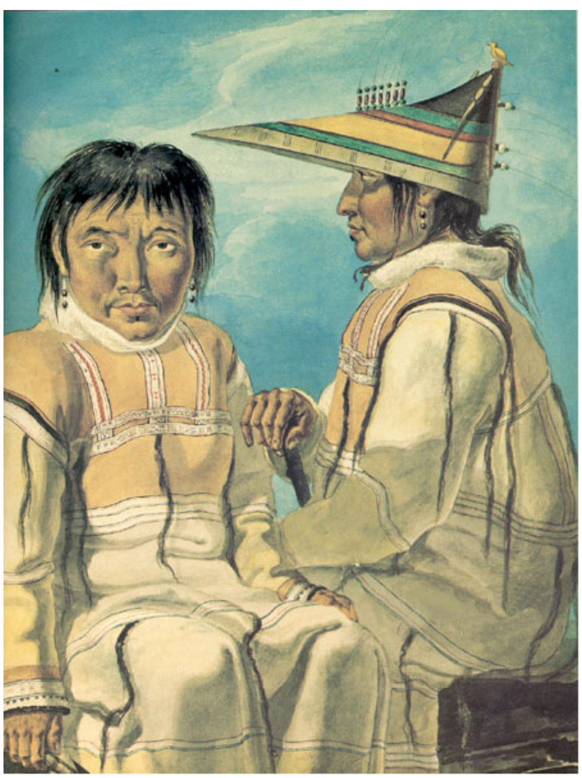
SETTLEMENT PATTERNS

Pre-colonial Alutiiq settlement patterns were linked to the seasonal availability of wild resources in various locations. Permanent winter communities were typically located near large shellfish beds and areas with a diversity of subsistence resources (Haggarty et al. 1991). They also were situated so that residents could observe approaching visitors at a distance. Seasonal summer fish camps were located near salmon streams. Hunting camps were used in spring and fall.

Winter villages were relatively large on Kodiak Island and the Alaska Peninsula, while in Prince William Sound they appear to have been smaller. Along the Karluk River, on the west side of Kodiak Island, archaeologists have uncovered a high density of sites that include winter villages composed of up to 20 multifamily dwellings, interspersed with outlying small settlements and spring and fall hunting camps (Crowell 1988:134).

Winter dwellings were more substantial and permanent than summer houses, which were built essentially to provide shelter while people were fishing and preparing salmon. Once the salmon season was over, people took their accumulated stock of prepared fish and moved back to the winter village. Koniag winter houses were semi-subterranean structures with a driftwood frame covered with sod. The Chugach inhabited winter houses of plank construction. Both types of houses were similarly laid out with a large common room and central hearth surrounded by smaller rooms used for sleeping. Winter homes were often large multifamily dwellings housing up to 20 people (Birket-Smith 1953).

POLITICAL AND SOCIAL ORGANIZATION



Alutiiq society in the 18th century was stratified into two groups: free people and slaves (Townsend 1980; Birket-Smith 1953; Gedeon 1989). Slaves were captured in raids or obtained through trade and considered the property of the owner. Free people were ranked within a status hierarchy rooted in a bilateral kinship system. Those people claiming the highest ranks were leaders (*aŋa·yuqaq*) of a local group and their immediate kinsmen who formed a kind of nobility or aristocracy. More distant relatives were considered to be commoners of lower rank. Commoners augmented by slaves did most of the physical

Fig. III-1. *Kodiak Island Toyon [Chief] named Nangquk, baptized Nikita, from Three Saints Bay*. (Mikhail Tikhanov 1817) labor (Birket-Smith1953:92). Rank and leadership were inherited. On Kodiak Island, for instance, the *aŋa·yuqaq* position was inherited from a father, an uncle, or a father-in-law (Gedeon 1989:40). Status and authority were based on an individual's personal qualities and the ability to accumulate and redistribute wealth to kinsmen and neighbors. By being generous, men substantiated their status and attracted a group of kinsmen who were willing to work for the kindred. A large set of followers reinforced a person's claim to rank and authority.

Leaders and their families were distinguished by wealth. On Kodiak Island wealth consisted of a wide variety of clothing, hunting equipment, stocks of food, and various forms of personal adornment including pieces of amber, dentalium shells, plates of abalone shell, and "considerable quantities" of glass beads (Gedeon 1989:42). The primary occasions for the redistribution of wealth were during the fall and winter feasts held in the *kashim* (community hall) built by the leader (Gedeon 1989:40).

Although leaders might exert considerable influence within a group of kinsmen, they held little coercive power (Gedeon 1989:40-41). Eloquence was an important criteria for successful leadership. A leader might talk his followers into a course of action, but he could not threaten them with sanctions if they disregarded his will. Another aspect of leadership was the possession of some sort of spiritual strength or expression. One of the most important responsibilities of a leader was to organize and deploy the labor of kinsmen for certain group efforts. For example, leaders organized and led hunting parties and were instrumental in organizing trade expeditions. They also occasionally mobilized kinsmen for raids to obtain wealth or exact revenge. However, individuals were not bound to follow the leader.

Kinship was the principal integrating factor in this ranked society. A tightly knit group united through bonds of kinship and often living in the same house, was the primary social unit. Birket-Smith (1953:158), the principal ethnographer for the Chugach, argued that descent was bilateral, as was common kinship among Yup'ik and Inuit groups to the north. There was no evidence to indicate a pattern of unilineal descent or the existence of clans, as was common in Southeast Alaska, the Pacific Northwest, and Athabaskan groups.

The extended-family household was the primary economic unit. Within this unit, the extraction and processing of subsistence resources was divided on the basis of rank and gender (Birket-Smith 1953:92). As noted above, people of rank did little or no physical labor themselves, but directed kinsmen when possible. Slaves were never the principal source of labor, but augmented the work force of kinsmen (Townsend 1980:149). The free male inhabitants of a household usually worked together on hunting and fishing trips away from the winter village. In the village they worked together to build houses, or to manufacture implements from stone, wood, and bone. The woman's domain was centered on the house. She raised children, tended the fire and stone lamps, gathered plants and shellfish, cooked, prepared skins and bark for garments and boats, fabricated thread out of sinew, and made baskets.

THE ECONOMY

The foundation of the aboriginal economy was the harvesting of wild fish, animals, and plants primarily for local consumption and secondarily for trade. The Alutiiq region had a diverse abundance of wild resources. The principal animal resources were sea mammals, marine fish, and shellfish. People also harvested a number of land mammals, birds, and plants.

At least twenty species of sea mammals are found in the Gulf of Alaska, waters including baleen and toothed whales, dolphins, sea otters, sea lions, and harbor seals. All were hunted, and supplied protein and calories, oil for heat and light, and skins for clothing and boats, though harbor seal and sea lion were probably taken in the largest numbers.

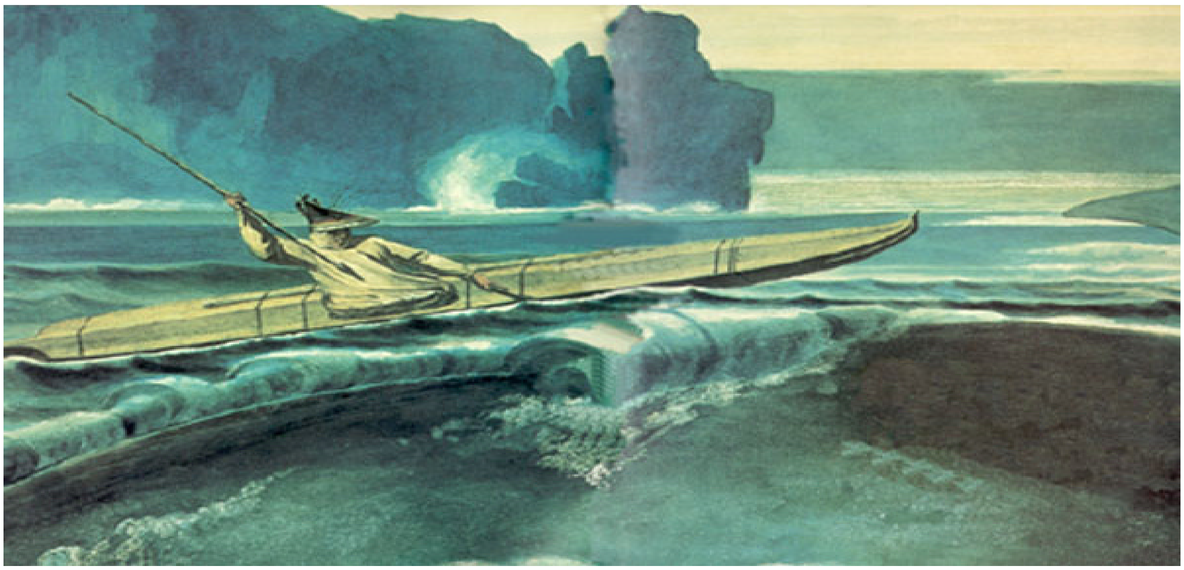


Fig. III-2. *Aleut Hunting* (Mikhail Tikhanov 1817)

Land mammals were distributed widely but unevenly over the region. There were on average about thirty species of land mammals in Prince William Sound and the main land areas of the Kenai Peninsula and Alaska Peninsula. But the Kodiak archipelago, geographically separate from the mainland, contained only seven resident land mammals (Haggarty et al. 1991). Kodiak Island's only large land mammal was the brown bear. Mountain goats and black bear were found only in Prince William Sound and on the Kenai Peninsula. Caribou and moose were found only on the Alaska and Kenai peninsulas. Brown bear and land otters were relatively ubiquitous throughout. Snowshoe hare and beaver were resident in all areas except Kodiak Island.

Fish, particularly salmon, provided another important food source. Over 287 species of fish are found in the Gulf of Alaska. Most abundant are the five species of salmon. Archaeological evidence indicates that salmon were most important in the Kodiak archipelago, especially in the area of western Kodiak Island (Haggarty et al. 1991). The Karluk River, for example, is estimated to have had an annual run of 10,000,000 salmon in the pre-colonial period (Haggarty et al. 1991:70). There were also important annual runs of chum and pink salmon in Prince William Sound. Relatively smaller anadromous fish runs, again mostly of chum and pink salmon, occurred along the Alaska and Kenai peninsulas.

Other kinds of fish caught by Alutiiq people included halibut, which is rich in protein but low in fat content. Herring were caught in large quantities and their oily flesh and eggs provided an important source of fat. Cod and rockfish were other important fish.

Shellfish and other intertidal invertebrates were important sources of food. Most members of the community could efficiently harvest them in large quantities. Shellfish types included chitons, barnacles, limpets, cockles, clams, mussels, snails, and octopus (Haggarty et al. 1991).

Fig. III-3. Koniag *Alutiiq* ceremonial coat made from the neck skins of cormorants and decorated with red and white tassels of dyed skin and gut and white fur trim (Chaussonnet 1988:209)

More than 180 species of birds frequent the Alutiiq region including sea birds, shore birds, and land birds. Birds were a seasonal source of food and skins for clothing (Fig. III-3). Archaeological studies have identified the remains of more than 40 species of birds at sites on Kodiak Island and the Alaska Peninsula (Haggarty et al. 1991:68). Pre-colonial bird populations were larger prior to the introduction of foxes, rats, and cats by Euroamericans.

Spring tended to be the leanest time of the year. Most of the food prepared and stored the previous summer and fall had been consumed in the winter feasts and migratory herring, birds, and salmon had yet to arrive. Late winter and early spring were devoted to hunting harbor seal and sea lion. The extreme low tides of spring were particularly advantageous for harvesting shellfish. As the season advanced, people hunted returning migratory birds, collected bird's eggs, and gathered early plants. Some men hunted small whales. By late spring herring and herring roe-on-kelp were harvested in Prince William Sound. In some places people were able to take advantage of early salmon runs. Halibut and cod were taken in calm weather throughout most of the year. By high summer salmon fishing was the dominant activity. On the cusp of summer and fall men shifted their focus to hunting mountain goats in Prince William Sound and the Kenai Peninsula and caribou on the Alaska Peninsula. Women picked berries throughout the region during late summer and early fall. By late fall and early winter men resumed hunting seals, sea lions, and small whales. Harvesting decreased during the period of winter ceremonies but people continued to harvest intertidal species and in Prince William Sound men took black bear in their dens.

Trade along the Pacific coast was common in the pre-colonial period. Trade items included sea mammal oil, ivory, puffin beaks, skins (caribou, marmot, ground squirrel, and sea otter), amber, copper, dentalium shells, abalone shells, boats, goat horn spoons, clothing, and slaves (Burch 1988:237). Aboriginal trade was stimulated by the appearance of manufactured goods from Europe, which preceded direct contact with Euroamericans and arrived through trade connections linking Alaska and Siberia (ibid).

Case III-4. Trade at Yakutat, 1788.

"Among the other trade goods which the people [Tlingits] brought for exchange with the galiot were two boys about twelve years old. One of them was a Koniag captured by the Kenais [i.e., the Dena'ina of Cook Inlet] before Kyktak island was occupied by the company; he was sold to the Chuiugach, then to the Ugalakhmiuts [Eyaks?] and finally became the property of the Koliuzh [Tlingit]. His name is Noiak-Koin" (Shelikhov 1981:96).

Fig. III-4. *Aleut of Kodiak Island in festival dress enacting the hunt.* (Mikhail Tikhanov 1817)

CEREMONIES AND RELIGION

As in other northern hunter-gatherer societies, *Alutiiq* spirituality was directed primarily at ensuring good relations between humans and animals for continued good hunting. Its social forms were personal and individual (such as taboos and proscriptions placed upon the hunter) as well as collective and public (as in the annual winter feasts). The spiritual world was highly animistic and most features of observable nature were thought to possess a spiritual essence. Within this vital world people warily negotiated their way by enlisting spiritual allies and observing a multitude of taboos or rules that guided their behavior in everyday life. Dire consequences could befall the person who broke customary proscriptions.

Case III-5. Kodiak Island Ceremonies, 1803.

According to the Russian, G. I. Davydov (1977:107), the dance he attended represented "hunters setting off to catch animals" -- probably a ceremony to honor animals so that they would return the following year. As he entered the *kashim*, Davydov was overwhelmed by the hot stuffy atmosphere created by about 60 men and women. Near a large lighted torch in the middle of the *kashim* sat two men with drums of animal bladders stretched around a hoop with a handle. On either side of the ''stage stood two young girls wearing cloaks, and all bedecked in finery, such as long bone through their nose and beads in their lower lip and ears, and on their heads they wore a great many eagle feathers." Two men carried puffin beak rattles and small baidarka paddles decorated with fish and sea mammal designs. From the ceiling, "were suspended various crossed darts and attached to them were: (1) a baidarka; (2) pelts representing various animals; (3) some hunting weapons and decoys… which help the Americans to lure seals." During the performance the men beat the drums and kept time by beating the rattles with their paddles. The young girls "held on to their capes and simply rocked from side to side. The chief was constantly shouting something like this: Here is the shore! Let us leap to it! The animals will come to he who has not yet killed!"…. Whenever the chief said 'here are animals!' then all would cry out in different voices, imitating the various animals…."

Religion infused everyday life and most ceremonies were at once spiritual, social, and political in nature. Ritual observances that attended chiefly succession, preparation for war, or other important events took place throughout the year, as occasion demanded. As winter approached ritual activity intensified and village chiefs hosted winter hunt ceremonies, memorial rituals, public displays of shamanistic healing, lavish feasts, and gift exchanges (Crowell 1992:19).

Fig. III-5. *Tamaima, an Inhabitant of Kodiak Island* (Mikhail Tikhanov 1817).

Chapter Four: Historic Transformations in The Pacific Gulf

Of those European countries to reach the Gulf of Alaska in the 18th century only the Russians were in a position to establish a colony. After a brief but fierce struggle with the Koniag, the Russians established their first permanent settlement at Three Saints Bay in 1784, and by 1800 had penetrated every corner of Alutiiq territory. In 1867 Russia sold Alaska to the United States and a new wave of foreigners arrived to work the fur trade. American interests later expanded to include the exploitation of salmon, timber, and minerals such as gold and copper. World War II brought a third wave of migrants, many of whom stayed on to work in the national defense industry created by the Cold War, or in the expanding commercial fishing industry. In 1959 Alaska became a state and oil was discovered on the North Slope ten years later. This stimulated a fourth wave of migration. Some came to work in the oil industry, but most were drawn by jobs generated by a booming state economy fueled by government spending of oil revenues. Along with new economic strategies, each group of newcomers brought sociopolitical arrangements and an understanding of the environment different from that of the Alutiiq people.

DEMOGRAPHIC CHANGE, 1780 - 1997

By demographic measures, the Alutiiq have been losing ground since historic contact (Table IV-1). Over the past two centuries, Euroamericans have expanded into the Pacific Gulf at the expense of the Alutiiq. The number of Alutiiq diminished, the proportion of Alutiiq in the regional population declined, and the total number of Alutiiq now is substantially less compared with populations two centuries before. These points are illustrated in Figs. IV-1 and IV-2.

As noted in Chapter Three, estimates vary as to the size of the pre-colonial Alutiiq population. But whatever the exact number, by the middle of the 19th century disease and exploitation by profiteers had decimated the Alutiiq population. Epidemics on Kodiak Island began in 1804, and occurred again in 1819-20 and 1827-28 (Fortuine 1989:204-208). The most devastating event was the smallpox epidemic of 1836-1839, which killed over 700 Alutiiq people on Kodiak Island alone (Tikhmenev 1978:198) reducing the already dwindling population by a third. Smallpox also ravaged populations in Prince William Sound and lower Cook Inlet wiping out entire villages (Fortuine 1989:234). Russian American Company records suggest that the smallpox epidemic in Prince William Sound was so severe that only four villages survived: Tatitlek, Kiniklik, Chenega, and a settlement on Montague Island.

The dramatic effects of epidemic disease are described in two first hand accounts, presented here as Case Studies IV-1 and IV-2. The first was recorded by a man named Ianovskii who was Chief Manager of the Russian American Company. Ianovskii witnessed the terrible effects of an influenza epidemic that occurred on Kodiak Island in 1819-20. The second account was printed in an ecclesiastical journal called the *American Orthodox Messenger* and reports the effects of a diphtheria epidemic in Prince William Sound occurring in 1906.

Figure IV-1. Population Trends in the Pacific Gulf Region, Historic Contact (circa 1780), and 1910-1997

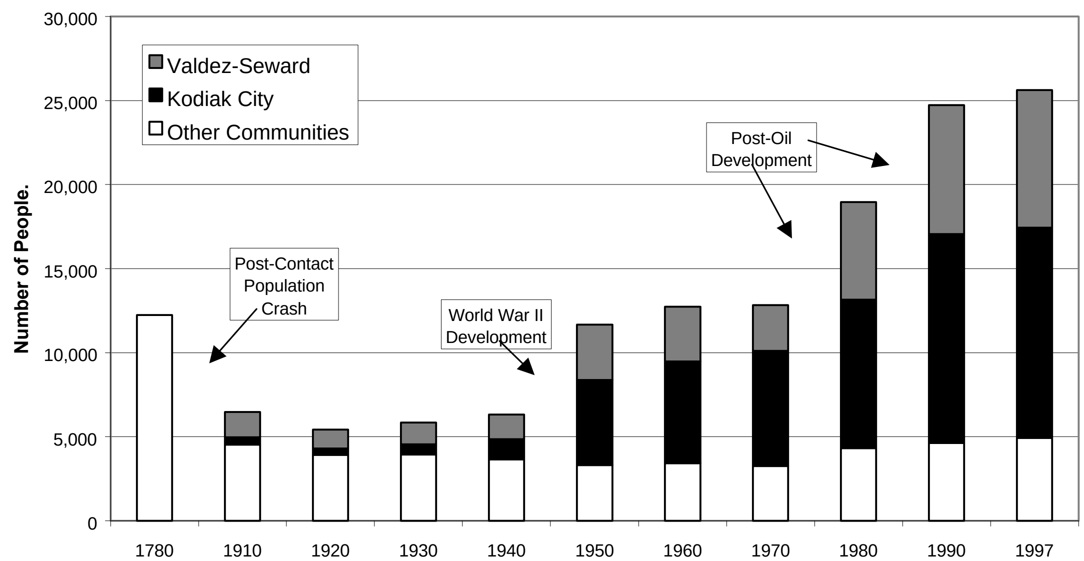


Figure IV-2. Population of Pacific Gulf Region, by Cultural Group, 1997

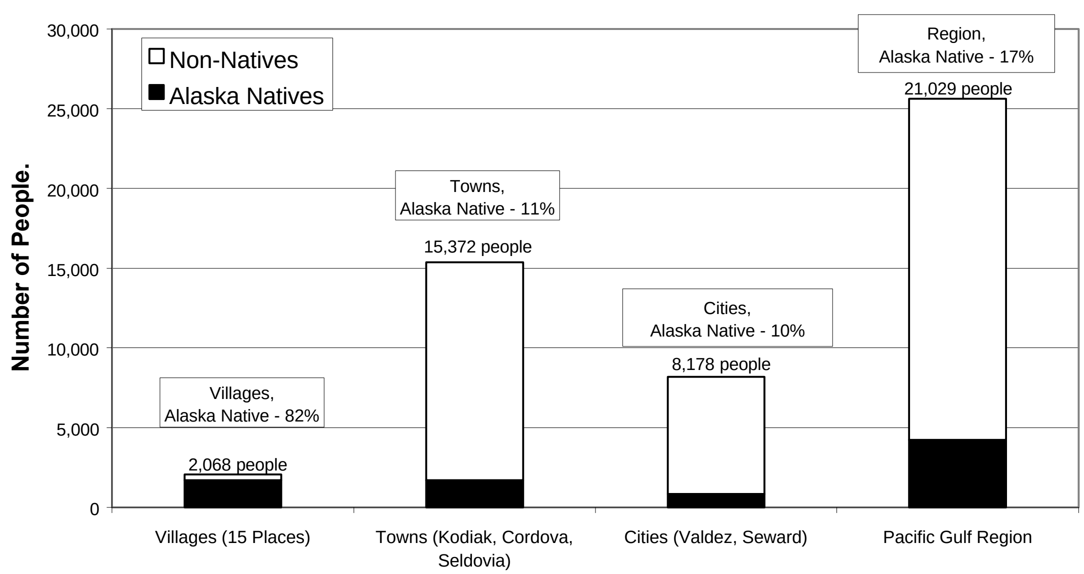


Table IV-1. Russian Census Figures 1792 - 1833 from Khlebnikov (1994)

Date	Kodiak Island	Prince William Sound	Alaska Peninsula	Totals
1792	5,696[a]	423	814	6,933
1796	6,206	766	n/a	6,972
1800	5,464	714	209[b]	6,387
1806	3,944[c]	n/a	n/a	3,944
1817	3,311	941	887[b]	5,139
1821	2,605	1,513[e]	838[d]	4,956
1825	2,917	1,563[e]	131	4,611
1833	2,510	n/a	n/a	2,510

a. May have included only adults.

b. Kodiak Islanders on the Alaska Peninsula.

c. Includes Kodiak Islanders living in Sitka.

d. It is uncertain if these are Kodiak Islanders whom the Russians moved to the Alaska Peninsula.

e. The increase in population may have been due to Koniag or Unangan hunters being moved into Prince William Sound.

Case IV-1. Influenza Epidemic on Kodiak Island, 1819-20

I can imagine nothing more somber and terrifying than the spectacle which greeted me when I visited the Aleut [Alutiiq] kazim! This is a large barn or barracks with board partitions, in which the Aleuts live with their families. In it were almost one hundred people. I visited them all, talking to them, questioning them, advising them, cheering them up and comforting them. Some were lying already dying, their bodies growing cold, next to those still alive; others were already dead, on whose cold breasts hungry children crawled, crying and trying to find food for themselves, but in vain! My heart contracted with pity, struck with horror, when I saw this melancholy picture of death. No artist could convey in sufficient colors this picture for the illumination of those who are wallowing in luxury, forgetful of death…(Fortuine 1989:201).

Case IV-2. Epidemic in Prince William Sound during the 20th century

In the first decade of this century several epidemics struck Prince William Sound. In 1906 epidemics of diphtheria from an unidentified pathogen in which eleven people, adults and children, died in Tatitlek within two weeks. Chenega was called the "kingdom of death." Twenty-two people died within two weeks, the survivors were described as "thin and exhausted, lifeless people with violent fits of coughing, with burnt-out faces, sunken cheeks and eyes, with wildly beating hearts." Five people were still sick, the rest like "shadows" or "wax figures." The priest gave out what medicine he had and called the people to a meeting where they elected a *toyon*, *starosta*, and a brotherhood chairman. He publicly thanked a young man who dug graves and brought wood and water during the epidemic. When the priest returned to Tatitlek one more person had died and others were dying. Kiniklik was spared, but the inhabitants asked the priest to bless the water for use in healing if they should get sick (Serafin 1907).

A second factor in the collapse of the aboriginal population was the Russian policy of forced relocation in which groups of Native men and women were moved about in order to satisfy the labor needs of the colony. Whole regions were emptied of people so that in 1871, an observer traveling along the coast of the Alaska Peninsula described a "desolate coastline with little sign of current human habitation" (Morseth 1998:48). By the late 1880s, however, Alutiiq people began to leave the centers of Russian occupation and resettle in other areas. For example, historic census records for Prince William Sound indicate that people moved to the villages of Tatitlek, Chenega, and Kiniklik from the old Russian center at Nuchek. As the old centers of non-Native influence were abandoned, new ones emerged, such as Valdez, Cordova, and Seward. By 1910, the populations of all three towns had surpassed that of the villages. The towns grew in response to the developing new economy that was not oriented toward the trade in furs but the extraction of mineral resources and fish. This pattern continued throughout the rest of the 20th century as non-Native towns grew in size while the Alutiiq villages remained essentially static. By 1997, there were about 4,176 Alaska Natives living in the Alutiiq region. Most were Alutiiq, but some (particularly those living in Valdez and Seward) were members of other groups (Inupiat, Yup'ik, Athabaskan, Eyak, and Tlingit).

In terms of population size, the Alutiiq have suffered substantial setbacks over time. There were less than half as many Alutiiq living in the Pacific Gulf in 1997 than in 1784. In 1997, the population of the Gulf of Alaska region was 21,029, twice that at contact if the lower pre-colonial population figures are accepted. The great majority of the population (83 percent) was not Alaska Native. There is also a seasonal influx of non-Natives into the region during the summer, including commercial fishermen, processors, recreational fishers, hunters and tourists.

The spatial dispersion of people and cultures in the region has not been uniform (Figs. IV-1 and IV-2). In 1997, most non-Natives resided in just four places: Kodiak City, Valdez, Cordova, and Seward. The fifteen other communities of the Pacific Gulf region were predominately Alutiiq, ten of which had populations that were comprised of about 80 percent Alaska Native. Thus in terms of geographic dispersion and use, the Alutiiq still occupied much of the Pacific Gulf in 1997.

The centralization of the non-Native population in four large towns and cities, and the preponderance of Alutiiq villages as settlements in the region, is strongly related to the different socioeconomic systems currently found in the Pacific Gulf. The number of people and cultural affiliations in a community are directly associated with the community's type of socioeconomic system, as described in subsequent sections.

SOCIAL, RELIGIOUS, AND POLITICAL CHANGE, 1784-1989

Several factors contributed to changes in Alutiiq sociopolitical organization during the period of Russian occupation. Loss of life through disease was the most dramatic. After the smallpox epidemic of 1839 the Russians consolidated the remaining Koniag population on Kodiak Island (see Case IV-3). This disrupted kin networks, individual social ties, and political alliances characteristic of pre-colonial Alutiiq society (cf. Knecht and Jordan 1985). In 1863 the Russian historian P.A. Tikhmenev (1978:347) wrote that "[f]rom this time on they began to change in every way, and thus the Kad'iak natives of today differ greatly from those of twenty-five years ago."

Case IV-3. Consolidation of the Koniag Population

To better administer the survivors of the smallpox epidemic of 1836-39, the Russians, in 1840, consolidated the 65 Koniag villages into seven settlements located near Russian establishments. These included Saint Paul (the present town of Kodiak), Three Saints Bay (present day Old Harbor), Orlov (the village of Eagle Harbor abandoned in the early 20th century), Karluk, Afognak (destroyed in the 1964 earthquake and relocated as Port Lions), Woody Island, and Ukamok (Hrdlicka 1944:19; Tikhmenev 1978:200). Such consolidation was not carried out in Prince William Sound.

The forced relocation and displacement of large numbers of Native people, especially men transported across the colony to hunt sea otters, disturbed established family relations and kin networks. It also had the unintended effect of creating new ties that stimulated the formation of a Creole population (Federova 1975:12). The Alutiiq then became a specific segment of a colonial society based on a layered system of Russians, Creoles, and Natives in which each group's rights and obligations were legally defined.

Throughout the life of the colony the number of Russians was always small. Few Russian women migrated to Alaska and most Russian men did not stay after their tenure was over, but some had liaisons with Native women that produced offspring. In 1822 there were 553 Creoles in the colony. By 1863 the official count was 1,989, and this did not include all persons of mixed descent (Morseth 1998:42). In Russian America a person's status was inherited and passed through the paternal line

(Morseth 1998:41). The colonial administration viewed the bicultural and bilingual Creoles as a bridge between Russia and Alaska. Creoles also represented a potential pool of skilled, educated labor to maintain and administer the colony, so were given an opportunity for a free education in Russia, provided they worked for the company for a stipulated period of time (Partnow 1993:127). Not all Creoles followed this path, however, and by the end of the Russian period Creoles as a group occupied an ambiguous position in colonial society. Some held positions of authority and lived outside the Native community while others were indistinguishable from Natives (Morseth 1998:42).

The arrival of the Americans meant the end of the Russian system of social and ethnic categories based on language and culture. Common American parlance combined Creoles and Alutiiqs under the term, "Native." Americans also referred to Creoles with the pejorative "half breed" and called Alutiiqs "Indians." The treaty that conveyed Russian possessions in Alaska to the United States noted only two categories of persons in the old colony, "Inhabitants," Russians that remained in the territory, and "uncivilized tribes." The "Inhabitants," if they chose to remain in the territory, were admitted to the enjoyment of all the rights of citizens of the United States while the uncivilized tribes were to be subject to such laws as the United States might adopt in regard to the aboriginal tribes of Alaska (Federova 1975:18).

The designation "uncivilized" derived from 19th century ideas about social evolution and "savagism," a wild state of nature occupied by Native Americans with both admirable ("noble savage") and despicable ("savagery") characteristics (Pearce 1967). Because they apparently lacked the basic attributes of civilization, such as organized religion, private property, and formal government, Alaska Natives, like the Indians of the lower 48 states, were considered to have a lower form of social life than Euroamericans. Some Alaska Natives, specifically the Aleuts of the Aleutian Islands, were considered "corrupted" from their natural state by their association with the Russians, who were viewed as villains committing unspeakable atrocities toward Alaska Natives (Torres 1990:232; see Case IV-4.)

Case IV-4. American Perceptions of Alutiiqs and Russians

According to U.S. Army Lt. Eli Huggins (1981) stationed in Kodiak in 1868, Kodiak Native people were known as "Aleyuts" and lived in about 20 villages separated from Russian and Creole communities. Huggins thought Kodiak Aleuts were distinct from Aleutian Island Aleuts because of their spirited and warlike character which manifested itself in the considerable resistance they offered the Russians. They were, in Huggin's view, a conquered people subjected to Russian atrocities that were "not exceeded by anything in the history of the Spanish conquest."

At the same time, the Alutiiq came to divide the social world into two groups: Russian and non-Russian. To all the latter they applied the term "Americanski," regardless of nationality (Morseth1998:48). Creoles were considered "Russians" and, because they spoke Russian, were typically recruited into the

Russian Orthodox Church as lay readers. Creoles appear to have been more versatile in their interactions with the emergent Euroamerican society than their Alutiiq kinsmen (Partnow 1993:169, 171).

At the top of the new social order were Euroamericans who in ever increasing numbers came to exploit and develop the wealth of a new American territory. Entrepreneurs, company men, and adventurers were drawn by gold on interior rivers, copper in Prince William Sound and the Wrangell Mountains, and stupendous fisheries in the Gulf of Alaska. The new migration stimulated the creation and growth of new non-Native centers at Seward, Valdez, and Cordova while the old Russian settlement of Kodiak continued as a commercial center.

The predominant social policy toward the "uncivilized" Alutiiq was pacification and eventual assimilation into the American social order. Sheldon Jackson, a Presbyterian missionary who served as General Agent for Education in Alaska from 1885 until 1906, articulated the policy of assimilation most explicitly. Jackson believed that contact with commercial whalers and fur traders had disrupted the old Native culture and aboriginal economy. Starvation, disease, and alcohol were spreading (Oswalt 1963:16-17). The solution, in Jackson's view, was conversion to Protestant Christianity and the education of Native children in boarding schools away from the influence of parents. To activate his program, Jackson divided Alaska up among several American Christian denominations. He conspicuously ignored the Russian Orthodox Church in this, and allotted Kodiak Island to the Baptists. Up until then Orthodox priests had sometimes campaigned against the ill treatment of Native people by Americans (Davis 1979), but now they burst into activity, establishing Russian schools and publishing materials in Native languages. The priests were particularly vocal in their concerns about Orthodox children who were forced into non-Orthodox boarding schools or orphanages (Kan 1988).

Many Alutiiqs had been baptized into the Russian Orthodox Church before the end of the Russian era. It was during the early American period that Orthodoxy became firmly established as an Alaska Native church in parts of Alaska. Despite the absence of resident priests in many villages, and possibly as a reaction to Protestant attempts to convert them, Alutiiq people became more faithful. Because of the absence of priests, Alaska Natives had the opportunity to form the Church to suit their own particular needs (Rathburn 1981). In Prince William Sound the presence of Orthodox Brotherhoods in each of the communities may have also solidified support for the Church. The aim of these brotherhoods was to maintain Church property, assist members during illness, provide food when needed, and to see to the moral improvement of the villagers (Hassen 1978:168).

The Native application of Orthodoxy was not confined to an ecclesiastical realm, but also influenced economic, political, and social areas of Alutiiq life (e.g., Stanek 2000, Simeone and Miraglia 2000, Mishler 2001). In some villages, the Russian Orthodox catechist wielded considerable power in the lives of residents. This influence declined somewhat during the 20th century but even in the late 20th century many village social activities were closely connected with the Orthodox Church, and it was the only institution entirely sustained by local funds (Davis 1970:129). The major social events of the year coincided with important religious holidays like Christmas and Easter.

As stated above, the sale of Alaska to the United States opened the region to immigrants. Many early immigrants were men from northern European countries, especially Sweden and Finland, attracted by the similarity in environment and an opportunity to make a living fishing and trapping. Many with Scandinavian roots migrated to Kodiak Island and the Alaska Peninsula and married Creole and Alutiiq women, adding to the cultural mix of the area. Applying knowledge from the Old World, new migrants helped to commercialize the area's cod and herring fisheries. Many also trapped mink, fox, and marten during the winter for commercial export. One source (Porter 1893:79) suggests Scandinavians were motivated to marry Alutiiq women in order to dodge federal regulations against non-Natives hunting and trapping fur-bearing animals, especially sea otters. Non-Native husbands of Native women were allowed to accompany Natives on hunting expeditions (Mishler 2001:19).

World War II brought a second major wave of immigrants to the Pacific Gulf region. Kodiak, for instance, grew into an incorporated city following the influx of military personnel and by 1943 11,000 troops were based there (Mishler 2001).

The new immigrants arrived with new values about the environment, including sport-hunting concepts like fair chase, trophies, and hunt management. The non-Native population of Alaska doubled between 1939 and 1950, and the number of resident hunting licenses more than tripled from about 9,000 in 1946 to 31,500 in 1955 (Sherwood 1981:143). Sports hunters had been drawn to Alaska since the turn of the century, but the war-era expansion of Alaska's road system and the increased population associated with military bases located near Anchorage, Fairbanks, and Kodiak substantially increased pressure on fish and big game resources. Introducing new species for sport hunting opportunities was in vogue during this period. Sitka black-tailed deer were introduced into Prince William Sound and Kodiak Island at the urging of the Cordova Chamber of Commerce and elk were introduced to Kodiak Island. By the end of World War II, deer had become a staple food for all the communities of Prince William Sound and most of those of Kodiak Island.

Alaska's growing population brought political pressure for greater local control of territorial resources. But when statehood was achieved in 1959 the partitioning of lands between state, federal, and private owners led to increasingly complex and contested regulatory regimes and resource use patterns in the Pacific Gulf.

During the early 20th century, Alaska Natives organized to publicly reject the overt policy of assimilation that had contributed to the loss of traditional lands and cultural practices. Native groups initiated a movement aimed at the recognition of aboriginal rights and the revitalization of Alaska Native cultures. In the years leading up to the Alaska Native Claims Settlement Act (ANCSA), Native people throughout Alaska struggled to gain recognition and respect in American society as distinct cultural groups with tribal rights. This involved overcoming the 19th century stigma ascribed to "uncivilized" Native society and culture.

Through the passage of ANCSA in 1971, Alaska Native people were empowered with new institutions and assets. In exchange for extinguishing aboriginal claims on 321 million acres and aboriginal hunting and fishing rights, Alaska Natives were compensated $962.5 million and received formal title to 44 million acres of land historically occupied and used by Native peoples. For the first time in the 20th century, economic arrangements afforded considerable value to identifying oneself as Native. Thirteen regional and over 200 village corporations were formed under ANCSA and engaged in both for profit and non-profit ventures. The Alutiiq were organized into three regional corporations: Chugach Alaska Inc. included Prince William Sound and Lower Cook Inlet; Koniag Inc. included the Kodiak Archipelago; and the Bristol Bay Native Corporation included Alutiiq villages on the Alaska Peninsula.

At the time, ANCSA was considered a landmark approach to satisfying Native land claims and ANCSA stimulated the formation of a variety of Alaska Native institutions that have worked toward the development of commercial enterprises and social programs. But the results have produced a mixture of successes and failures, depending upon the region, community, and type of program in question.

Historic social wounds continued to affect many Alutiiq communities during the 20th century (Pullar 1991:23). In the early 1980s several movements began to address these problems by advocating the development of a strong sense of identity based on traditional Alutiiq values. The revitalization movement led to the development of cultural and language programs in many schools, the documentation of local histories, compilation of elders' teachings, construction of local museums, and the creation of Alutiiq dance groups. A striking example of one Alutiiq community's persistence and commitment to cultural survival was the reestablishment of the village of Chenega at a new site (called Chenega Bay) twenty years after the old village was destroyed by the tsunami resulting from 1964 Alaska earthquake.

Because ANCSA provided inadequate protections for customary and traditional fishing and hunting patterns of Alaska Natives, subsistence subsequently emerged as a central focus of political activity. In an effort to protect subsistence uses, Congress included subsistence provisions in the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. Under Title VIII of ANILCA, the state was allowed to manage fish and game on federal lands in Alaska as long as it provided for the subsistence practices of rural Alaska residents. In 1989, the Alaska Supreme Court ruled that a rural subsistence preference violated the state's constitutional provisions for common use of wild resources. The state subsequently granted subsistence rights to all Alaska residents on state and privately owned lands. The federal government consequently assumed management of subsistence uses by rural residents on federally owned lands in Alaska. Generally speaking, Alaska Native subsistence interests were not specifically recognized or protected under state and federal law. When the Native Class sued to recover damages after the *Exxon Valdez* oil spill, the judge ruled that under Alaska State law Alaska Native's losses were not qualitatively different than those of the general public (Bryner 1995).

ECONOMIC CHANGE

Several concurrent transformations characterized the economic history of the Pacific Gulf during the Russian and American periods. First, various wild resources became both subsistence products and export commodities. Wild resource production continued for small-volume exchange and consumption within the region ("subsistence use"), but some wild resources were harvested for export and sale outside the region ("commercial use"). Second, the organization of production and distribution was transformed from predominately kin based groups ("domestic mode") to a more diversified system which included a variety of organizations not based on kinship, such as trading companies with bonded laborers, capital-holding corporations with employees, processing-trading companies purchasing products from independent small-holder fishermen and trappers, and various other employer-employee wage form arrangements. Third, the geographic locus of control over economic enterprise shifted from local to non-local centers of operations, such as cities in Russia and the western United States. By the late 20th century, the result of these transformations was an amalgam of modes of economic production within the Pacific Gulf region. Industrial capitalism, based in Alaska's larger population centers, was the dominant mode and exerted major economic influence in the Pacific Gulf. Concurrently, a mixed subsistence-cash economy predominated in rural villages and featured a relatively disjointed complex of subsistence and commercial-wage sectors.

During the early Russian period, the colonial administration attempted to exercise strict control over Native economic life, exacting tribute and quotas from Native workers who were forced to labor for trading companies. But economic control varied by locale and Native group. It was most pronounced at the trade centers, such as Kodiak and the Aleutians. The Chugach in Prince William Sound, on the other hand, were considered more independent than the Koniag or Aleuts and subject to less direct economic control (Federova 1975:17; Haggerty et al. 1991). The colonial administration found it easier to transport Koniag and Aleut workers to Prince William Sound and southeast Alaska, as they were more inured to company disciplines, instead of attempting to round up and supervise local Chugach hunters.

The Russians made extensive use of indigenous technology, finding baidarkas and throwing boards and darts more efficient than wooden skiffs and firearms for harvesting sea otters. They also instituted a system in which influential men were appointed as *toyons*, a Siberian word used to designate the leading men of a community. The *toyon* organized hunting parties, encouraged men to hunt on the company's behalf, and ensured that all furs were turned over to the Russian America Company once the hunt was finished (VanStone 1967: 55; Hassen 1978: 134). The *toyon* system continued into the American period, though the position became an elected office.

With the purchase of Alaska by the United States, the Alutiiq were "let go", as one elder from Tatitlek put it, and relieved of their economic obligations to the Russian trading monopoly. This left the Alutiiq free to find a place as participants in the new capitalist system. However, Alutiiq skill, knowledge, and labor were no longer essential in the emergent industries and the Alutiiq had to contend with fast-moving, increasingly industrialized businesses from outside the territory that quickly commercialized a wide variety of resources for export, irrespective of aboriginal or Russian conventions. Hardship, overwork, and death by starvation were not uncommon results.

Initially, the new commerce retained the Russian focus on furs. Sea otter pelts remained the major export. Alutiiq hunters were encouraged to hunt for American trading companies, such as the Alaska Commercial Company, under a credit-in-goods arrangement. At the height of the trade, credit was loose and hunters sometimes avoided paying off credit and sold furs to independent traders for cash.

By 1867 sea otter populations were already in decline in the Gulf of Alaska because of over-hunting. Federal management opened the fur resources of the region to the demands of the competitive commercial market, and between 1870 and 1890 well over 4,000 sea otters were killed each year (Morseth 1998:63). By the 1890s, the decline in sea otters forced trading companies to cut costs by closing stores and tightening credit. Alutiiq hunters in the sea otter industry had to find new ways to earn money for purchasing imported goods. An alternative was found in the developing commercial fishing industry.

Large-scale commercial fishing began in Alaska in the 1880s. Investment from Seattle and San Francisco based canneries enabled commercial fishing and processing to become the dominant commercial sector of the regional economy. Between 1884 and 1890, Alaska canning production more than doubled each year (Morseth 1998:87). By 1897, 40 percent came from the Kodiak and Chignik districts, while approximately 20 percent came from Bristol Bay (Morseth 1998:88). Intense competition led canneries to maintain high levels of production by using mechanized procedures and disciplined wage labor (Grinnell 1901). The Alutiiq were encouraged by the canneries to sell fish, either from company boats or as independent small-holder crews. Some Alutiiq were employed building boats or working in cannery stores. Canneries preferred to hire Chinese, Japanese, Filipinos, and Mexicans who were considered more disciplined and reliable than the Alutiiq, whose "season-regulated way of life had no place in a society increasingly dominated by assembly line speedup" (Hinckley 1972:126; see Case IV-5).

Case IV-5. Alutiiqs as Industrial Workers

"After making sufficient wages to supply their personal wants and getting a few dollars ahead, the desire for hunting and fishing seizes them and they are apt to leave the cannery when they are most wanted. To prevent this, contracts are signed and payment made upon completion of the contract… Indians [Alutiiqs] are doubtless improvident…nature has provided for them without much labor…white men and Chinese must work to get something to eat, while the waters and the forests furnish Indians with all they want…The Indian is perfectly capable and can probably work as well as the Chinese if he could only be made to understand the exact conditions." (Moser 1899:25)

Alutiiq hunters preferred sea otter hunting and fur trapping to commercial fisheries but by the 1890s canneries began to hire Alutiiq fishermen as the sea otter trade declined. Some Alutiiq families gained access to commercial fisheries by marrying Scandinavians and other foreigners who arrived with experience and capital to work in the industry. After about 1900, commercial salmon fishing on company boats or private skiffs became more fully integrated into the seasonal round of most Alutiiq families. By the 1930s, the normative pattern for the Alutiiq was intense commercial fishing activity in the summer, followed by subsistence hunting and fishing in the winter supplemented by trapping and hunting seals for bounty. Subsistence continued as an essential and reliable sector of the village economic system throughout this period.

Production technology in the commercial fisheries became increasingly capital intensive and the industry was dominated by large capital holding companies based in Seattle and San Francisco. However, there were niches in the fishery for small independent fishermen who had enough money to purchase a fishing boat and gear. Salmon were caught with gill nets and seines, although fish traps owned and operated by the canneries caught the largest volume of fish. Most Alutiiq men participated in the fishery as “company men” operating boats and gear that were owned by the cannery. Alutiiq women worked in the canneries. After World War II, local fishermen demanded more autonomy from the canneries. Since the canneries owned the traps, which caught most of the fish, they essentially controlled the fishery. After statehood was achieved in 1959 state regulation required the fish traps be dismantled thus loosening the companies’ hold on production and making it possible for the subsequent expansion of the fleet of independent catcher-sellers (Strickland n. d.: 70).

In 1975, the State of Alaska restricted access to the commercial salmon fishery by introducing limited entry permits. In order to qualify for a commercial fishing permit, a fisherman had to demonstrate, among other things, a sustained record of fishing over time. Initially limited entry created the potential for economic disparities between families. For example, while some Alutiiq did obtain limited entry permits those who had worked as crewmembers and who had no personal record of selling fish were unable to enter the fishery as permit holders. Furthermore, many Alutiiq fishermen were not fully informed about the new system and its intricacies and failed to apply for licenses.

COMMERCIAL FISHERIES, 1975-1995

Commercial fisheries have been an important part of the commercial-wage sector of Pacific Gulf communities during the late 20th century. Markets and fish resources have been dynamic during this period, and local commercial fisheries have adjusted to them. Trends in commercial fisheries from 1975-95 are presented in this section, using statistical information from the Alaska Commercial Fisheries Entry Commission (ACFEC).

As shown in Figure IV-3, Kodiak City was the dominant commercial fishing community in the Pacific Gulf and the relative rankings of local fisheries did not change substantially from 1975-1995. By weight, of the Pacific Gulf commercial fish harvest in 1976, 75 percent was harvested by Kodiak City, 17 percent by Cordova-Seldovia, and 8 percent by Alutiiq villages. For the 1994 harvest, 73 percent was taken by Kodiak City, 19 percent by Cordova-Seldovia, 7 percent by Native villages, and 2 percent by Valdez. Kodiak City clearly stands out as the major center for commercial fishing in the Pacific Gulf – it was among the top ten ports for commercial fish landings in the United States during the late 20th century. Kodiak City was the preferred location for many fish buyer-processors and for a relatively large local commercial fishing fleet. Cordova and Seldovia, two predominately non-Native towns, were the next largest fishing ports as measured by volume of catch with commercial fishing as the major sector of these town’s economies. In terms of volume, commercial fisheries were much smaller in the Alutiiq villages

Figure IV-3. Commercial Fisheries Dominance, Gulf of Alaska Communities, 1976, 1986, 1994

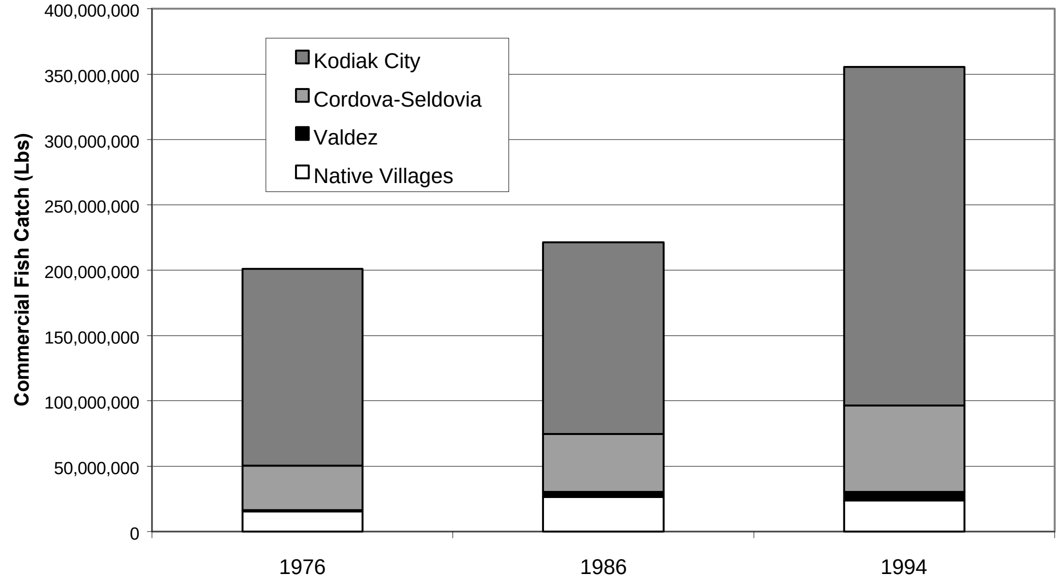
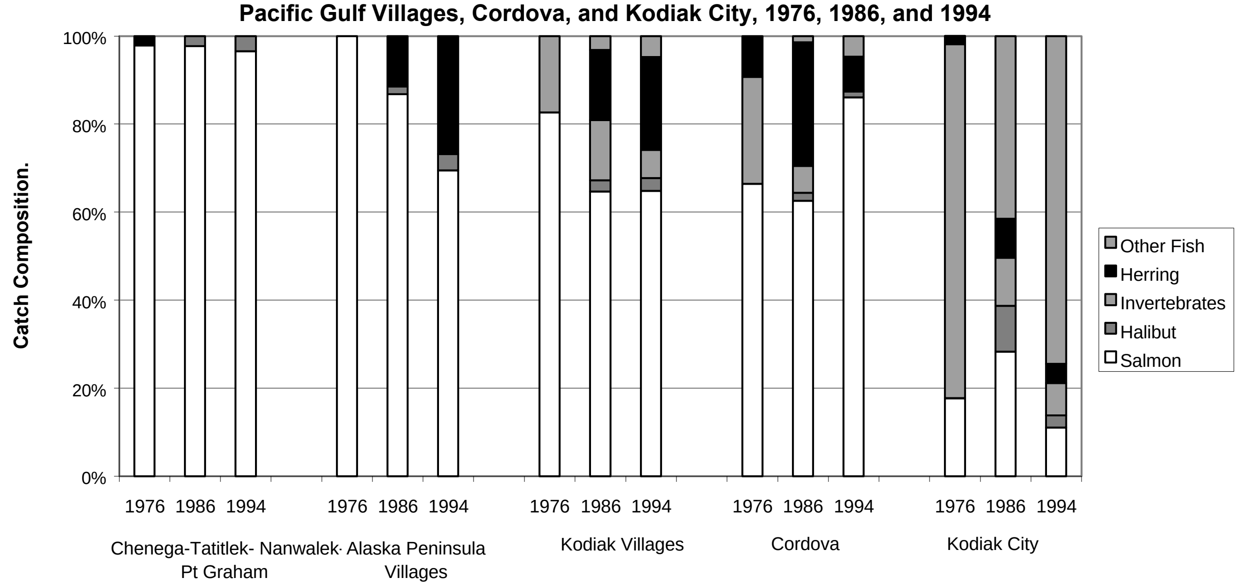


Figure IV-4. Diversification of Commercial Fisheries, Pacific Gulf Villages, Cordova, and Kodiak City, 1976, 1986, and 1994



where small-scale operations predominate. Valdez became a participant in commercial fisheries during this period, but oil transport was and remains the primary economic engine of this community.

The commercial fishing industry was substantially more diversified in Kodiak City compared with most other communities (see Figs. IV-4 and IV-5). In Kodiak City, “other fish” (primarily pollock) was the major fish category harvested in 1994, while salmon comprised only about 10 percent of the catch by weight. Seldovia’s fisheries were also relatively diversified. By contrast, other Pacific Gulf communities were primarily involved in the harvest of salmon. Kodiak City fishermen heavily harvested king and Dungeness crab in 1976, before crab populations crashed and pollock fisheries were developed.

Kodiak City and Alaska Peninsula fisheries were by far the most lucrative fisheries, while those of the Alutiiq villages in Lower Cook Inlet-Prince William Sound were much less profitable as revealed by the mean annual commercial fisheries sales per permit during recent years (see Figs. IV-6 to IV-8). There were considerable differences between Alutiiq villages in terms of the earnings provided to families from the commercial fishing sector during this period. In general, commercial fishing provided robust earnings in Alaska Peninsula villages, moderate earnings in Kodiak villages, and relatively low earnings in villages in Prince William Sound and Lower Cook Inlet. There appeared to be a decline in fish sales per permit following a peak in 1988-89 for Alaska Peninsula, Cordova, and Kenai fisheries. Sales per permit were highest at Kodiak City during the late 1980s and early 1990s when groundfish dominated this fishery.

In terms of participation by fishermen, there were notable differences between communities. In Kodiak City, permits fished increased from about 400 in 1975 to about 900 in 1983. The number of permits fished fluctuated between about 700 to 800 permits between 1983 and 1992, then permits declined considerably from 1993-95 to about 550 permits (Fig. IV-9). The total commercial harvest for Kodiak City did not increase during the period of rapid permit growth -- harvests fluctuated between about 100-150 million lbs from 1975-1985. But landings increased rapidly during 1986 and 1992, from 150 million pounds to a peak of about 325 million pounds. This doubling of volume occurred in association with a major change in the species composition of the commercial harvest and roughly parallels substantial growth in the community's population during the same time period. By the end of the 20th century, the Kodiak Island commercial fisheries were highly significant in terms of catch volume and ex-vessel value (total and per permit), and relatively diversified in harvested species. As stated above, by comparison, the commercial fisheries of most Alutiiq villages were relatively insignificant in terms of volume and ex-vessel value (total and per permit), and relatively narrow in diversification of species harvested. The fisheries at Cordova and Seldovia were moderate in size and value compared with Kodiak City and less diversified.

Participation trends varied across Alutiiq villages as well. Participation in commercial fishing declined in Alutiiq villages in Prince William Sound and Lower Cook Inlet, from about 40 permits fished annually during the 1980s to somewhat less than 20 permits fished annually during the 1990s (Fig. IV-10). This was the Pacific Gulf fishery showing the lowest fish sales per permit fished (about $10,000-$30,000 annually) (Fig. IV-7). By contrast, local participation appeared relatively stable in Alutiiq villages of the Alaska Peninsula (about 50-60 permits fished annually) and in Alutiiq villages of the Kodiak area

Figure IV-5. Diversification of Commercial Fisheries, Kenai Area, Seldovia, and Valdez, 1976, 1986, and 1994

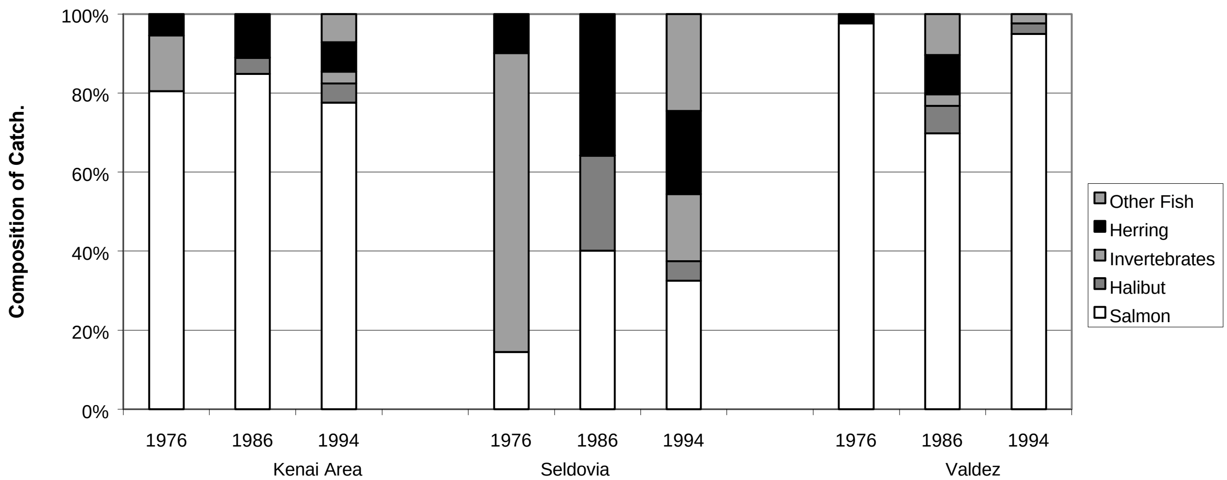


Figure IV-6. Commercial Fish Sales by Permit Holders, Kodiak City, Cordova, and Kenai Area, 1975-95

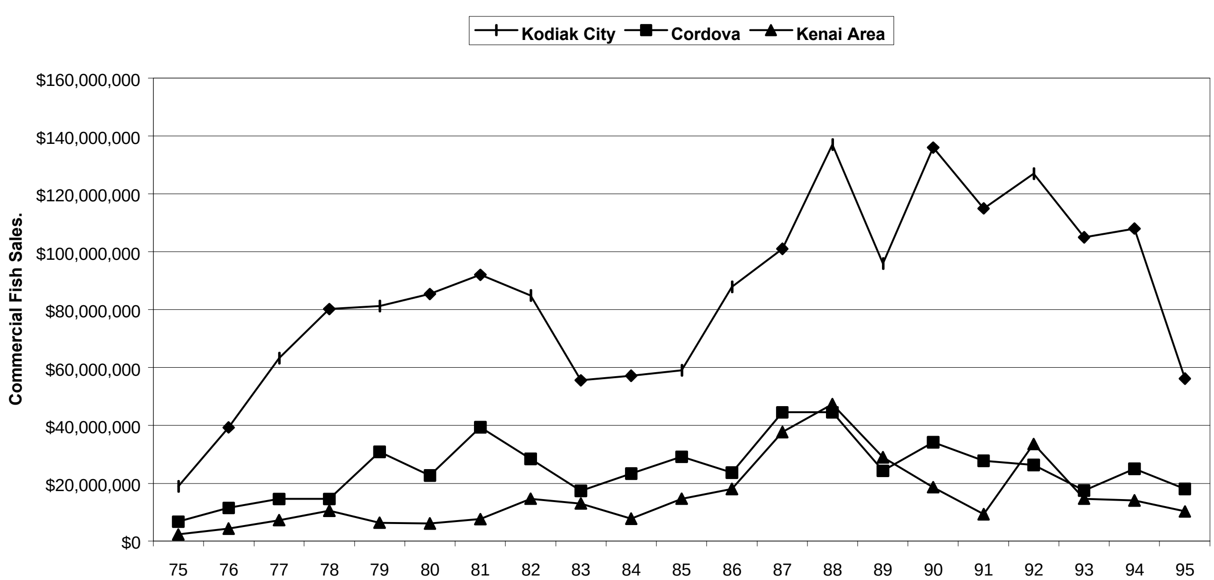


Figure IV-7. Commercial Fish Sales by Permit Holders, Pacific Gulf Villages, 1975-95

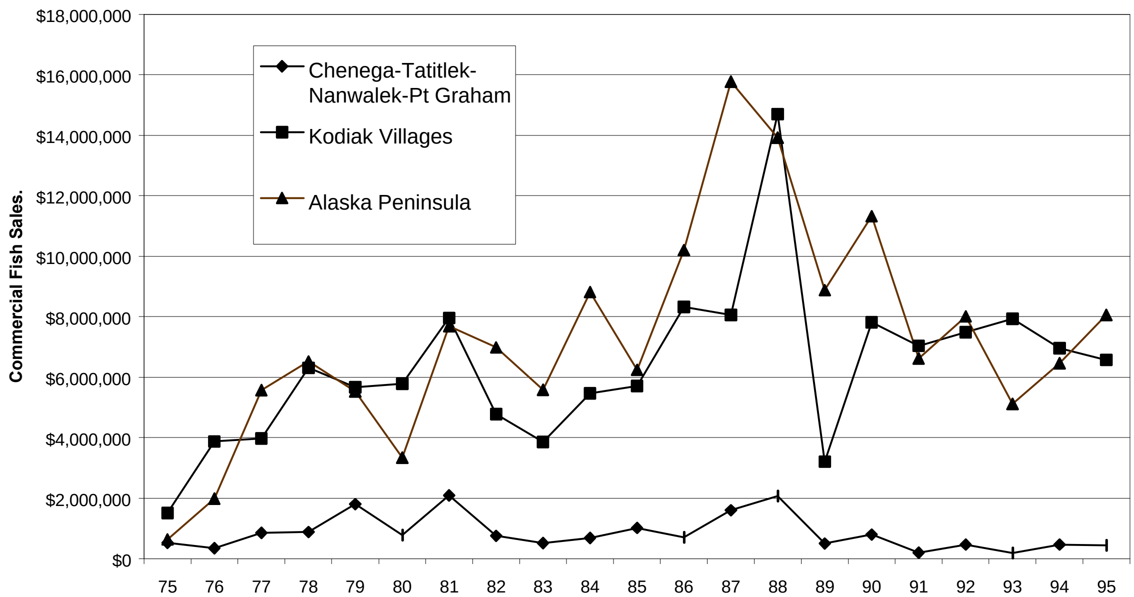


Figure IV-8. Commercial Fish Sales by Permit Holders, Seldovia and Valdez, 1975-95

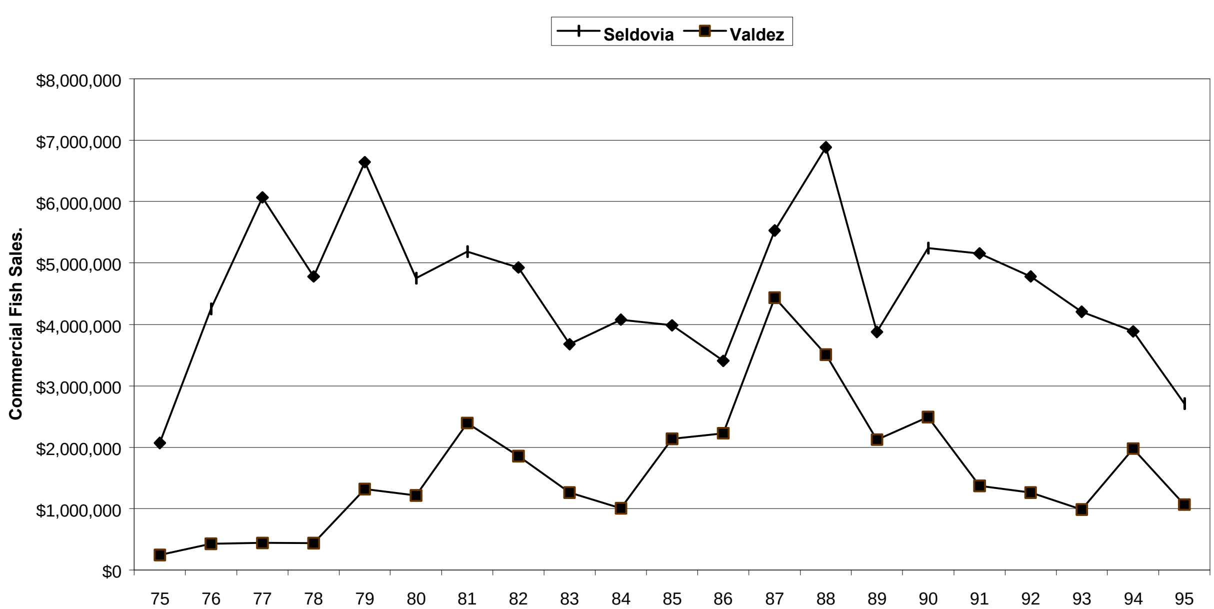


Figure IV-9. Number of Commercial Fishing Permits Fished, Kodiak City, Cordova, and Kenai Area, 1975-95

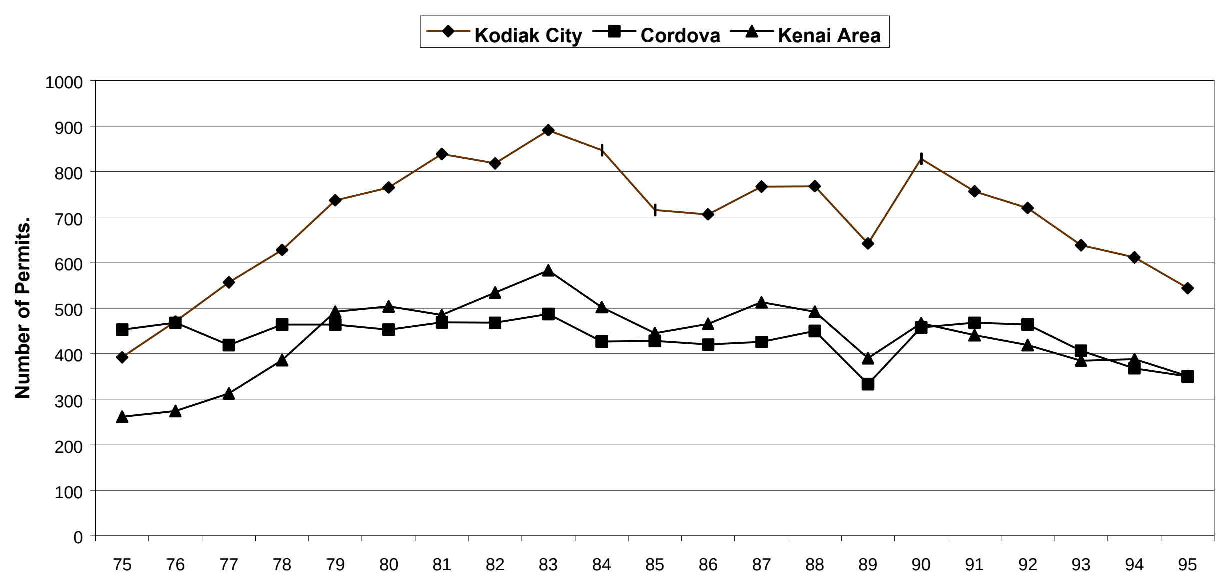


Figure IV-10. Number of Commercial Fishing Permits Fished, Pacific Gulf Villages, 1975-95

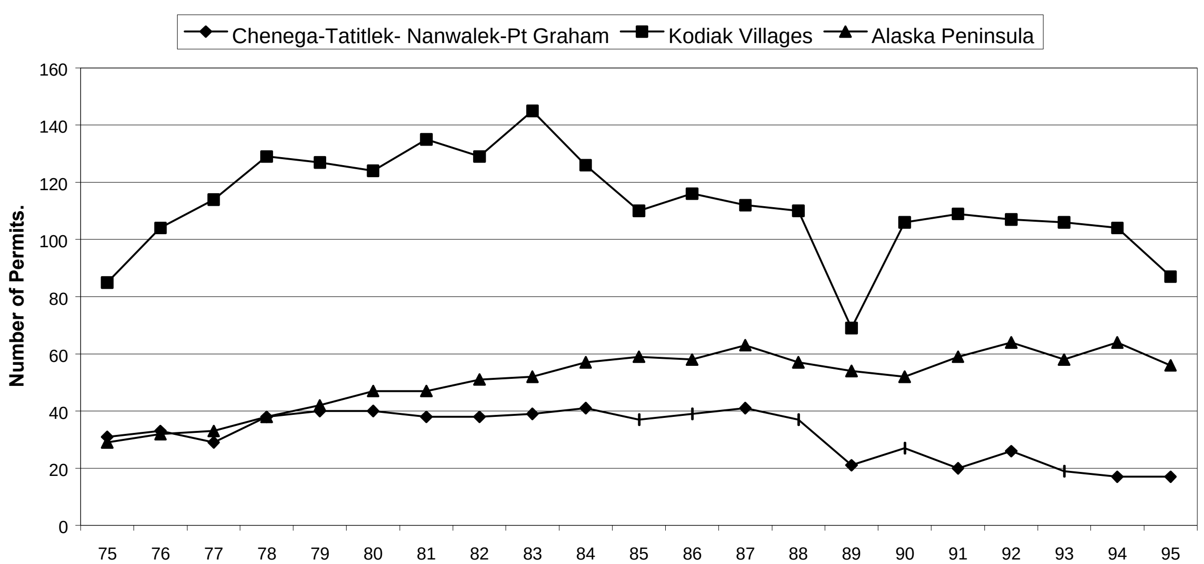
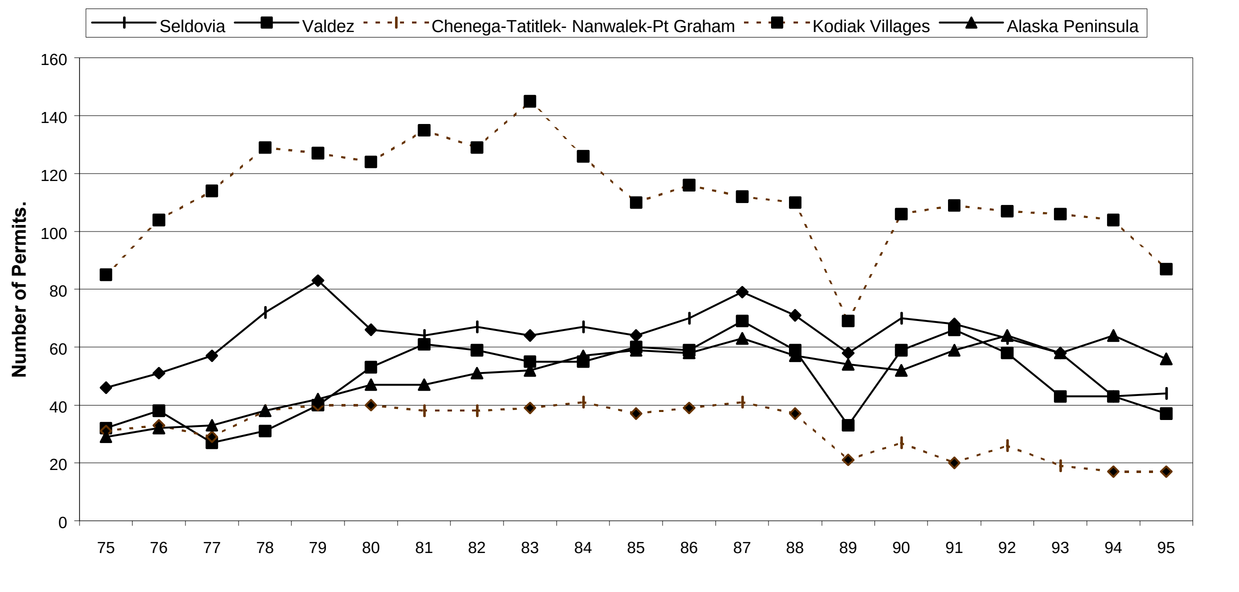


Figure IV-11. Number of Commercial Fishing Permits Fished, Pacific Gulf Villages, 1975-95



(about 100-110 permits fished annually) (Fig. IV-11). These fisheries demonstrated more consistent and relatively good returns per permit during this period (Fig. IV-7). There was a slight downturn in the number of participants in commercial fishing during the 1990s in other areas -- Kodiak City (across most fisheries -- halibut, crab, pollock, salmon), Cordova (declines in herring and halibut), Kenai area (declines in halibut and salmon), Seldovia (declines in halibut and salmon), and Valdez (declines in halibut) (Figs. IV-9 and IV-11).

A number of factors contributed to this decline in Prince Williams Sound including the introduction of limited entry regulation, increasing availability of farmed salmon from Peru and British Columbia, increasing competition and the capital intensive nature of the fisheries (Stratton and Chisum 1986:101). Fishing has become technologically dependent on radar, sonar, winches, factory ships, and safety equipment. Competition in the worldwide market requires fishermen to catch more fish, which requires better boats and equipment, which in turn requires loans, insurance, and better equipment to satisfy the insurance. Unable to make the required investments village people sell their permits, often to non-village residents. Villagers have also been frustrated over what they see as poor management of the fisheries, and in particular management strategies that force fishermen to compete for the resource in close proximity in small bays and estuaries.

In summary this chapter has outlined some of the historical transformations that have shaped contemporary Alutiiq society, economy, and culture. The legacy of Russian colonialism survives mainly in the Russian Orthodox religion, which is a central feature of contemporary Alutiiq culture. More broadly the Russian colonial period marks the first phase in the systematic exploitation of Alaska's resources by non-Natives, and the subjugation the Alutiiq people. The purchase of Alaska by the Untied States ushered in a second phase of colonial exploitation, but America's legacy is necessarily more complex. Where the Russians had focused solely on fur, the Americans turned a wide range of animal and mineral resources into commodities. The American drive to exploit Alaska's resources eventually led the state and federal governments to address the aboriginal claims of the Alaska Native people. In return for relinquishing their claims to the land, Alaska Natives received monetary compensation and land. The effects of Alaska Native Claims Settlement Act have been mixed and have not solved the social or economic problems of small villages. The Act has provided the larger Native community with some economic and political influence and has led to a sense of empowerment. But ANCSA did not resolve the issue of subsistence, which is one of the most pressing issues facing Alaska Natives today. In part, Title VIII of ANILCA protected subsistence rights and the current federal management programs do provide Native people with a venue for participating in the management of wild resources on federal lands, but not on state or private lands. However, the sole right to manage those resources rests with the federal and state governments.

Today the economic transformations ushered in by Russian and American colonialism have continued in Alutiiq villages. While commercial fishing remained a central economic sector in most Pacific Gulf communities during the late 20th century there was a notable decline in commercial fishing in Alutiiq villages. As an alternative some Alutiiq fishermen explored occupations as hunting and fishing guides in developing tourist industries. But during the late 20th century, monetary income in Alutiiq villages was increasingly obtained through employment in public sector jobs. This marks the most recent transformation in the Alutiiq economy, from the relative autonomy of self-employed fishermen and trappers, to a life more deeply imbedded in capitalism.

Chapter Five: Pacific Gulf Communities on the Eve of the Oil Spill

After two centuries of historic transformation – one under the Russian and one under American dominion – the human groups of Alaska's Pacific Gulf presented a composite of cultural traditions and settlement types. The main cultural groups were Euroamerican and Alutiiq, with other smaller enclaves of Alaska Natives (Eyak and Dena'ina), Filipinos, and Hispanics. Most Alaska Native families traced long historic roots in the region. Most Euroamericans were new arrivals, though within each town there was a core of old non-Native families with substantial roots. The population was spread among three distinct types of communities – villages, towns, and cities. This chapter presents a "snap shot" description of these communities as it was on "the eve" of the *Exxon Valdez* oil spill. The materials presented here are primarily drawn from observations made during the late 1970s through late 1980s, particularly from studies conducted by ADF&G, Division of Subsistence. Some data from the 1990s are used selectively when they are relatively complete and illustrative of patterns and trends occurring in the 1980s, especially for comparative purposes. The chapter sets the stage for the detailed description of the oil spill, provided in Chapter Six.

SOME KEY CHANGES TO THE NATURAL ENVIRONMENT

By the 1980s, important changes had taken place in the availability of natural resources of the Pacific Gulf, some related to natural events and others due to human activities. Regarding the latter, Table V-1 lists big game transplants, which took place in the study area in the 20th century. Of these, deer transplants to Prince William Sound and Kodiak and the moose transplant to the Copper River Delta have been the most successful in providing a reliable new wildlife population for hunting by local residents. Indeed, state and/or federal management authorities have recognized "customary and traditional uses" of all three populations, citing evidence of the integration of use of these populations in local subsistence patterns. Also, natural extensions of the ranges of certain species have taken place in the 20th century. Perhaps most notable are the extension of the range of moose to the southwest along the Alaska Peninsula and the expansion in the range and numbers of sea otters, which some local residents blame for scarcities of marine invertebrates such as clams and crab (e.g., Stratton 1989:107).

Regarding fish, the primary change was the development of enhanced or new runs of salmon, primarily pink salmon in Prince William Sound, but also runs in the Kodiak area and Cook Inlet. These stocks have been enhanced primarily for commercial harvest. Certain other fisheries stocks, such as king crab around Kodiak and in lower Cook Inlet, were depleted by the late 1970s and early 1980s, at least in part, by commercial exploitation.

Community residents also report that certain resources were depleted following the 1964 earthquake as lands subsided in some areas and rose in others. For example, some Prince William Sound clam beds were destroyed by uplift after the earthquake (Stratton 1989:105-107).

Table V-1. Game Transplants in the Study Area in the 20th Century

Species	Year[1]	Location
Deer	1916	Prince William Sound
Deer	1924	Kodiak Island Archipelago
Elk	1929	Afognak and nearby islands
Moose	1949	Copper River Delta
Mountain goat	1952	Kodiak Island
Sheep	1964	Kodiak Island

[1] **Y**ear of first transplant. In many cases, subsequent transplants occurred.

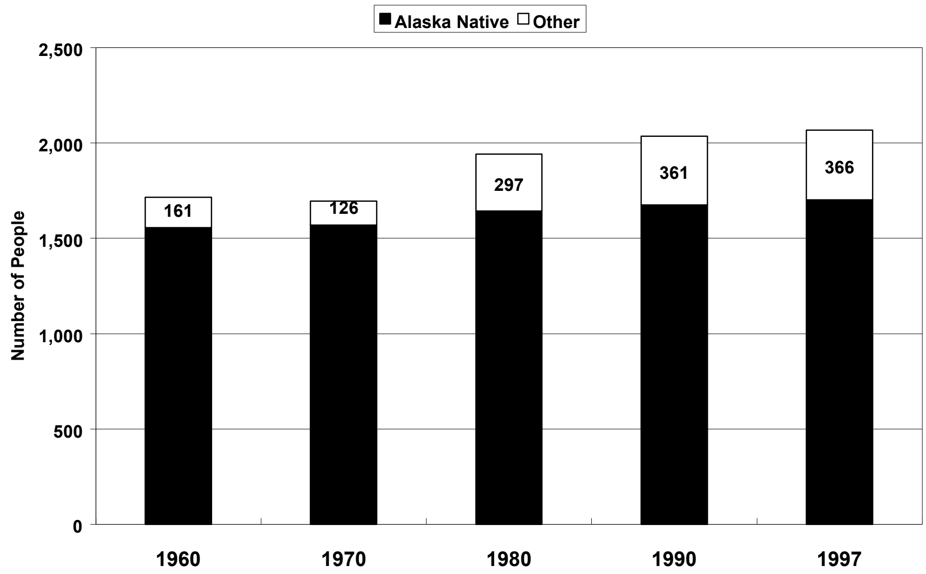
Source: Burris and McKnight 1973

DEMOGRAPHIC TRENDS DURING THE LATE 20TH CENTURY

In 1960, the year of the first federal census after Alaska achieved statehood, there were fifteen Alaska Native villages in the Pacific Gulf with a total population of 1,716 (Fig. V-1). Most (90.6 percent) of this village population was Alaska Native. The total population of the Pacific Gulf was approximately 12,815 people in 1960. Most (79.6 percent) was non-Native; 21.4 percent was Alaska Native. Of the region's Alaska Native population, somewhat more than half (56.6 percent) lived in villages (Table V-2).

By 1970, three of the fifteen villages had been destroyed by natural disasters -- Afognak, Chenega, and Kaguyak. All three were devastated by tsunamis following the 1964 earthquake. As stated in Chapter Two, one response of human groups to environmental disasters is to migrate to other locations with more favorable prospects. This is what survivors chose to do in this case. Afognak community was replaced by Port Lions in 1965. Kaguyak residents relocated in Akhiok and Old Harbor. It took twenty years of work, including a diaspora in Tatitlek, Cordova, and Anchorage, but finally, a core of Chenega families founded Chenega Bay on Evans Island and returned to western Prince William Sound in 1984. Another new village was founded on the Alaska Peninsula in 1965 when several families from Perryville and Chignik Lake resettled at Ivanof Bay.

Figure V-I. Population of Alaska Native Villages of Oil Spill Area, 1960 - 1997



The population of the Pacific Gulf grew by 12.6 percent between 1960 and 1970, about a third of the growth rate of Alaska as a whole (33.8 percent) during the same period (Fig. V-2; Table V-3). The village population declined by 1.2 percent over the same period. The Gulf's Alaska Native population grew slightly (6.9 percent) over this ten-year period, much below the rate of growth for statewide Alaska Native population (19.0 percent). These modest growth trends continued during the 1970s. The Pacific Gulf population grew by 24.3 percent and the area's Alaska Native population increased by 16.1 percent by 1980, both figures being below the state average for the period (Table V-4, Fig. V-2). The village population grew more slowly, increasing 14.5 percent.

For the post-oil development period of 1980 to 1990, growth rates accelerated. There was a notable 30.8 percent in the Pacific Gulf, almost matching the state's 36.9 percent increase (Table V-5, Fig. V-2). The region's population reached 23,453 people. However, during the same period, the population of the fifteen villages was relatively stable, growing by only 4.9 percent. The area's Alaska Native population grew by 19.2 percent, much below statewide Alaska Native population increase of 34.6 percent.

By the 1990 census, there were fifteen Alaska Native villages in the Pacific Gulf, the same as in 1960. Their population was 2,036, with 82.3 percent of this Alaska Native (Table V-5). This was a modest increase of 18.6 percent over 1960 and 4.9 percent over 1980, when the total population was 1,941 (84.7 percent Alaska Native) (Table V-2, Fig. V-2). Meanwhile, the population of Alaska increased by 143.2 percent between 1960 and 1990 and 36.9 percent between 1980 and 1990 (ADOL 1998:23).

Table V-2. Population of Communities in the Area Affected by the *Exxon Valdez* Oil Spill, 1960

Community	Total Population	Alaska Native Population[1]	Percentage, Alaska Native
Small, Predominately Alaska Native Communities			
Akhiok	84	83	98.3%
Chenega	60	58	96.4%
Chignik Bay	99	80	80.7%
Chignik Lagoon	108	92	85.4%
Chignik Lake	107	105	98.3%
Kaguyak	36	20	55.9%
Karluk	129	125	96.9%
Larsen Bay	72	60	83.5%
Nanwalek (English Bay)	78	71	91.4%
Old Harbor	193	179	92.8%
Ouzinkie	214	191	89.4%
Perryville	111	106	95.7%
Port Graham	139	137	98.7%
Port Lions (Afognak)	190	154	81.1%
Tatitlek	96	93	96.4%
Subtotal	1,716	1,555	90.6%
Other Communities: "Rural"[2]			
Cordova (city only)	1,128	186	16.5%
Kodiak[3]	6,256	494	7.9%
Seldovia	460	145	31.6%
Subtotal	7,844	826	10.5%
Subtotal, "Rural"	9,560	2,380	24.9%
Other Communities, "Non-rural"			
Seward (city only)	1,891	250	13.2%
Valdez	555	87	15.6%
Whittier	809	31	3.8%
Subtotal, "Non-rural"	3,255	367	11.3%
Totals	12,815	2,747	21.4%

[1] Place-specific data on Native population not available. Estimates based on 1970 percentage of population Native (Table V-3). Chenega based on Tatitlek.

[2] Listed are communities and areas classified as "rural" by the Alaska Joint Board of of Fisheries and Game in 1989 and thereby eligible for subsistence uses.

[3] Kodiak Island Census Area excluding the villages

Source: Rollins 1978

Table V-3. Population of Communities in the Area Affected by the *Exxon Valdez* Oil Spill, 1970

Community	Total Population	Alaska Native Population	Percentage, Alaska Native
Small, Predominately Alaska Native Communities			
Akhiok	115	113	98.3%
Chenega Bay	0	0	
Chignik Bay	83	67	80.7%
Chignik Lagoon[2]	78	67	85.4%
Chignik Lake	117	115	98.3%
Ivanof Bay	48	46	95.8%
Kaguyak	59	33	55.9%
Karluk	98	95	96.9%
Larsen Bay	109	91	83.5%
Nanwalek	58	53	91.4%
Old Harbor	290	269	92.8%
Ouzinkie	160	143	89.4%
Perryville	94	90	95.7%
Port Graham	107	96	89.7%
Port Lions	227	184	81.1%
Tatitlek	111	107	96.4%
Subtotal	1,754	1,569	89.4%
Other Communities: "Rural"[1]			
Cordova[3]	1,164	192	16.5%
Kodiak[4]	8,410	665	7.9%
Seldovia	437	138	31.6%
Subtotal	10,011	995	9.9%
Subtotal, "Rural"	11,765	2,564	21.8%
Other Communities, "Non-rural"			
Seward[5]	1,587	210	13.2%
Valdez	1,005	157	15.6%
Whittier	130	5	3.8%
Subtotal, "Non-rural"	2,722	372	13.7%
Totals	14,487	2,936	20.3%

[1] Listed are communities and areas classified as "rural" by the Alaska Joint Board of of Fisheries and Game in 1989 and thereby eligible for subsistence uses.

[2] Chignik Lagoon missing for 1970 census. Estimate here is midpoint between 1960 and 1980 for total population; assume percent Native same as 1980.

[3] Cordova city limits only

[4] For total population, Kodiak Island Borough excluding the six villages. Native population is Kodiak City (657) and Woody Island (8).

[5] Includes city of Seward, Grouse Creek Group, and balance of Seward CSA. for total population. City of Seward only for Native population.

Source: Rollins 1978

Table V-4. Population of Communities in the Area Affected by the *Exxon Valdez* Oil Spill, 1980

Community	Total Population	Alaska Native Population	Percentage, Alaska Native
Small, Predominately Alaska Native Communities			
Akhiok	105	101	96.2%
Chenega Bay	0	0	
Chignik Bay	178	95	53.4%
Chignik Lagoon	48	41	85.4%
Chignik Lake	138	123	89.1%
Ivanof Bay	40	37	92.5%
Karluk	96	96	100.0%
Larsen Bay[1]	144	120	83.3%
Nanwalek	124	98	79.0%
Old Harbor	340	315	92.6%
Ouzinkie	173	163	94.2%
Perryville	111	103	92.8%
Port Graham	161	141	87.6%
Port Lions	215	158	73.5%
Tatitlek	68	53	77.9%
Subtotal	1,941	1,644	84.7%
Other Communities: "Rural"[2]			
Cordova[3]	2,241	286	12.8%
Kodiak[4]	7,472	931	12.5%
Seldovia	479	117	24.4%
Subtotal	10,192	1,334	13.1%
Subtotal, "Rural"	12,133	2,978	24.5%
Other Communities, "Non-rural"			
Seward[5]	2,524	238	9.4%
Valdez	3,079	175	5.7%
Whittier	198	17	8.6%
Subtotal, "Non-rural"	5,801	430	7.4%
Totals	17,934	3,408	19.0%

[1] Larsen Bay excludes 24 in group quarters (cannery)

[2] Listed are communities and areas classified as "rural" by the Alaska Joint Board of of Fisheries and Game in 1989 and thereby eligible for subsistence uses.

[3] Cordova Census subarea for total; city only for Native.

[4] Kodiak Island Borough excluding the six small villages

[5] Includes city of Seward, Grouse Creek Group, and balance of Seward CSA. for total population. City of Seward only for Native population.

Source: Bureau of the Census 1982, 1984; Alaska Department of Labor 1991

Table V-5. Population of Communities in the Area Affected by the *Exxon Valdez* Oil Spill, 1990

Community	Total Population	Alaska Native Population	Percentage, Alaska Native
Small, Predominately Alaska Native Communities			
Akhiok	77	72	93.5%
Chenega Bay	94	65	69.1%
Chignik Bay[1]	160	85	53.1%
Chignik Lagoon	53	30	56.6%
Chignik Lake	133	122	91.7%
Ivanof Bay	35	33	94.3%
Karluk	71	65	91.5%
Larsen Bay	147	124	84.4%
Nanwalek	158	144	91.1%
Old Harbor	284	252	88.7%
Ouzinkie	209	178	85.2%
Perryville	108	102	94.4%
Port Lions	222	150	67.6%
Port Graham	166	150	90.4%
Tatitlek	119	103	86.6%
Subtotal	2,036	1,675	82.3%
Other Communities: "Rural"[2]			
Cordova[3]	2,579	272	10.5%
Kodiak[4]	10,274	1,251	12.2%
Seldovia	316	48	15.2%
Subtotal	13,169	1,571	11.9%
Subtotal, "Rural"	15,205	3,246	21.3%
Other Communities, "Non-rural"			
Seward[5]	3,937	547	13.9%
Valdez	4,068	239	5.9%
Whittier	243	30	12.3%
Subtotal, "Non-rural"	8,248	816	9.9%
Totals	23,453	4,062	17.3%

[1] Excludes 28 in group quarters in Chignik Bay

[2] Listed are communities and areas classified as "rural" by the Alaska Joint Board of of Fisheries and Game in 1989 and thereby eligible for subsistence uses.

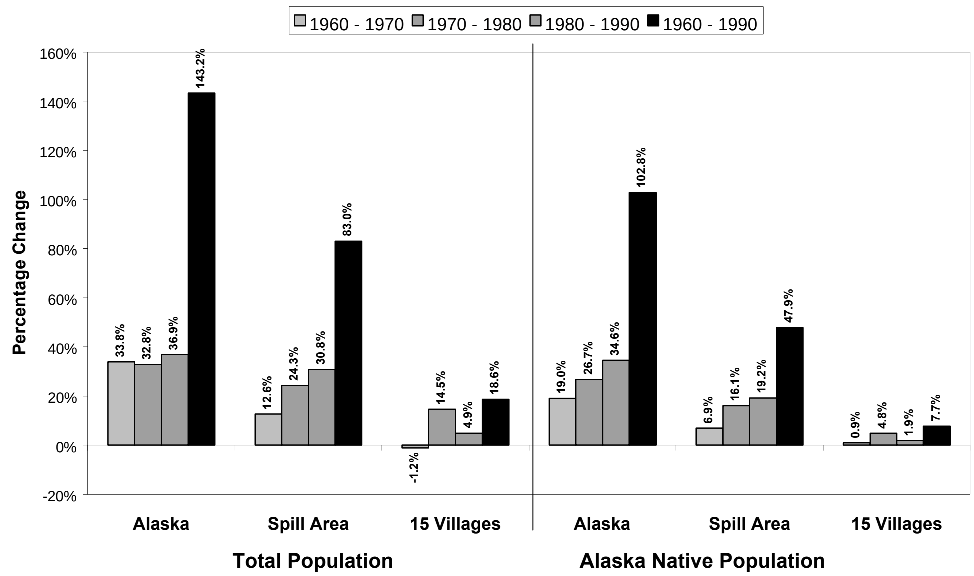
[3] Cordova Census subarea

[4] Kodiak Island Borough excluding the six small villages and the Coast Guard Station

[5] Includes city of Seward, Grouse Creek Group, and balance of Seward CSA.

Source: Alaska Department of Labor 1991

Figure V-2. Percentage Change in Population 1960 - 1990



By 1990, less than half of the Pacific Gulf Alaska Native population lived in villages (41.2 percent), while 58.8 percent lived in towns or cities with a non-Native majority. Of all Alaska Natives, 79.9 percent lived in communities considered “rural” under state/federal law, and 20.1 percent lived in non-rural areas (Table V-5).

The following summarizes demographic trends from 1960 to 1990 for the study area:

- While the population of spill area communities increased 83.0 percent over the 30-year period, the growth rate was only 58.0 percent of the statewide growth during the period (a 143.2 percent increase);
- Although the number of Alaska Native villages was the same at the beginning and the end of the period (15), the population of these villages grew only 18.6 percent, just 22.4 percent of the area’s growth rate and just 13.0 percent of the growth rate of the state;
- Growth of the overall Alaska Native population of the spill area (47.9 percent increase from 1960 to 1990) also failed to keep pace with the statewide rate of growth of the Native population (102.8 percent increase);
- The percentage of the study area’s population composed of Alaska Natives dropped steadily, from 21.4 percent in 1960 to 17.3 percent in 1990, due to the population growth in the towns;
- The Alaska Native population of the villages of the spill area grew more slowly than that of the area and the state, just 7.7 percent from 1960 to 1990;
- The percentage of the population of the Alaska Native villages made up of Alaska Natives remained very high, but dropped over the 30-year period, from 90.6 percent in 1960 to 82.3 percent in 1990; and,

- The percentage of the area's Alaska Native population living in villages dropped from a majority (56.6 percent) to a minority (41.2 percent) over the 30-year period.

TRANSPORTATION

As continues to be the case, all of the villages in the spill area in the 1980s were off the state's road system. Port Lions was serviced by the Alaska Marine Highway, as was Chignik Bay a few times a year. The primary means of transportation to each village was by small plane, with all villages but Chenega Bay having landing strips (Fig. V-3). Poor and rapidly changing weather made travel to all of these villages problematic at times. The costs of goods and services were substantially higher than those of communities along Alaska's road system.

Figure V-3. Residents of Ivanof Bay on the Alaska Peninsula help unload supplies from a small plane. In the 1980s and 1990s, villages of the study area depended upon air transportation to obtain goods and services.

THE SUBSISTENCE SECTOR OF THE LOCAL ECONOMY

The Pacific Gulf Economy: Patterns Before the Spill

Two general types of economic systems predominated in Alaska during the late 1980s (Wolfe and Walker 1987). A subsistence-based mixed economy characterized small villages, while an industrial capital economy characterized urban centers like Anchorage, Fairbanks, and Juneau. One distinguishing feature of subsistence-based mixed economies is moderate-to-high use of wild foods (Wolfe and Walker 1987). Wild food production and distribution is called a subsistence sector of the village economy, which exists alongside of, and is integrated with, a commercial-wage sector.

To assess the relative strength of the subsistence sector of Pacific Gulf communities, per capita wild food productivity in Gulf of Alaska communities can be compared with other communities and regions of Alaska.[1] The annual wild food harvests (pounds per capita) of Gulf of Alaska villages and towns (18 communities) were compared with the harvests of 139 other communities in Alaska, grouped into eight regions (see Fig. V-4). The number of communities in each regional group is indicated along the horizontal axis. For instance, there were 17 communities in the "urban" group, 35 communities in the "road" group, and so forth. Each community is treated as a separate data point in analysis. The range of per capita harvests per community in each region is displayed by the vertical bracket, and the mean per capita harvest for all communities in each region is shown by the dark horizontal bar. The box along each vertical bracket shows the 95 percent confidence interval about the mean harvest among communities in the set. Ninety-five percent of communities in the region fall within this range.

As shown in Figure V-4, per capita community wild food harvest levels in Alaska communities form a continuum. However, there is a statistically significant break in the continuum between urbanized communities (the lowest harvesting group) and all other community groups in the state. In the urban group, per capita wild food harvests range from lows of about 16 pounds (Fairbanks) and 19 pounds (Anchorage) to highs of about 94 pounds (Homer) and 110 pounds (Hope) on the Kenai Peninsula. The mean urban community harvest falls at 63 pounds per capita and the 95 percent confidence interval is 47 to 78 pounds for the set of urban communities. Valdez is at the high end of the urban group of communities, producing wild food harvests of 88 pounds (1991), 103 pounds (1992), and 79 pounds (1993). Kenai is in the middle-to-high end of the urban group, with wild food harvests of 40 pounds (1982), 75 pounds (1991), 74 pounds (1992), and 84 pounds (1993). The urban group is statistically different from all other regional groups (sig. = .05), using the Bonferroni test for difference of means. This statistical break provides quantitative support for the urban categorization of these 17 places by the Alaska Joint Board of Fisheries and Game under the state's subsistence statute. Wild foods do not

[1] Subsistence harvests are reported here in pounds usable (dressed) weight per capita. Factors used to convert whole fish, mammals, invertebrates, and birds into usable pounds are reported in the Division's Community Profile Database (ADF&G 2001). Fall (1990) provides an overview of a typical Division "baseline" study that is designed to collect harvest data. Subsistence harvest estimates include harvests taking place under subsistence, personal use, general, and sport regulations, and also include resources removed from commercial catches for home use. Resources purchased in stores or at markets are not included.

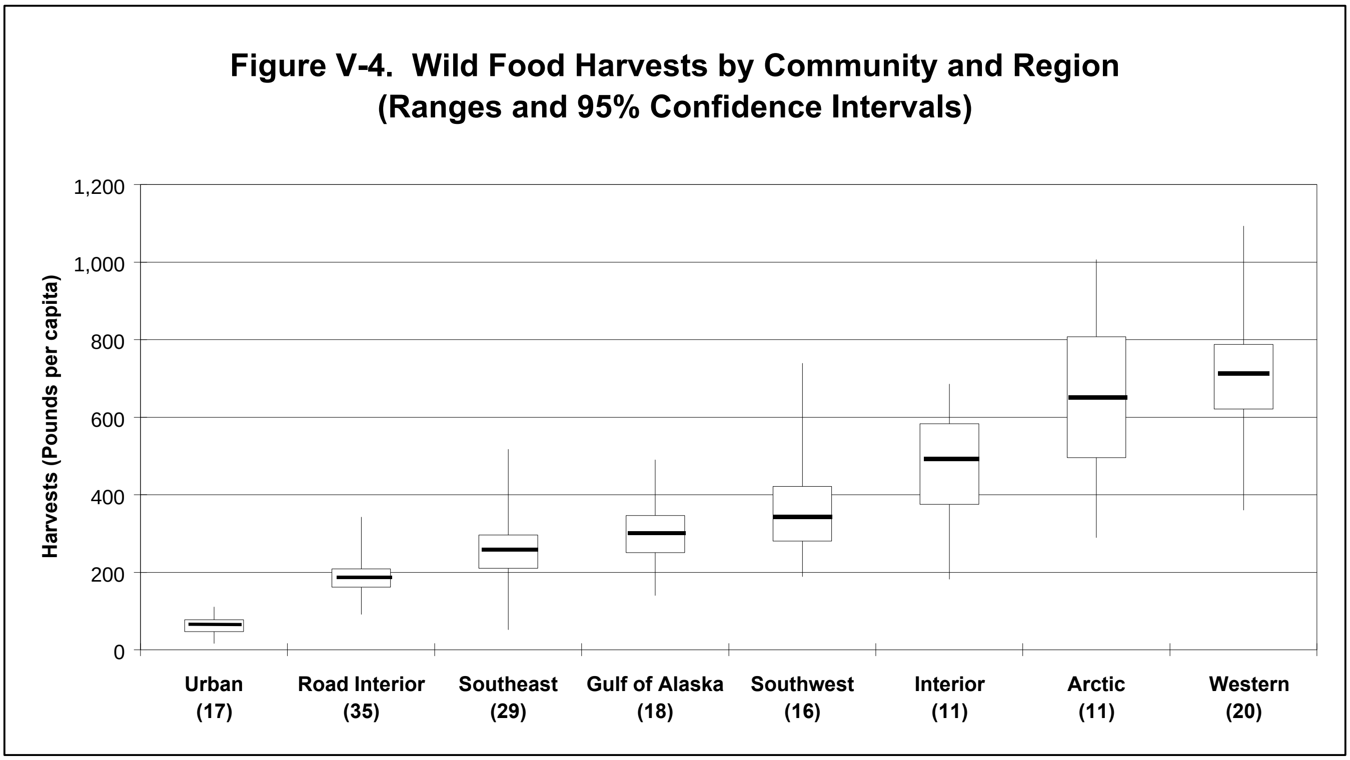


Figure V-4. Wild Food Harvests by Community and Region
(Ranges and 95% Confidence Intervals)
Harvests (Pounds per capita)
1,200
1,000
800
600
400
200
0
Urban
(17)
Road Interior
(35)
Southeast
(29)
Gulf of Alaska
(18)
Southwest
(16)
Interior
(11)
Arctic
(11)
Western
(20)

provide a substantial part of the food supply for most urban residents in Alaska. In Anchorage, the wild food harvest of 16 pounds per person provides about 10 percent of the Recommended Dietary Allowance (RDA) for protein and about 1 percent of the RDA for energy (kilocalories) for the population. Accordingly, the local socioeconomic systems of communities in the urban group cannot be said to display a developed subsistence sector. Most wild food harvests in urbanized places are conducted under sport regulations. A relatively well-developed sport tradition is reflected in the levels of harvests in the urban Alaska places.

Mean annual per capita wild food harvests for the other groups are as follows: Road Interior (185 pounds), Southeast (253 pounds), Pacific Gulf (298 pounds), Southwest (351 pounds), Other Interior (479 pounds), Arctic (652 pounds), and Western (705 pounds). The harvests of these rural regional groups display features of a cline (that is, a gradual change in the trait within rural communities over a geographical area). Group 2 (Road Interior) is not statistically different from Groups 3 and 4 (Southeast and Pacific Gulf), but is statistically distinct from Groups 5 to 8. Group 3 (Southeast) is not statistically different from Groups 2, 4, and 5, but is statistically distinct from Groups 6 to 8, and so forth. Along this continuum, wild food harvests in communities of the Pacific Gulf (298 pounds per capita) fall somewhat below the mean of all rural communities in the data set, which is 366 pounds (a pound of food per day). On average, Pacific Gulf subsistence harvest volumes are about 100 pounds per capita higher than harvests by rural communities along the road network (Athabaskan, Euroamerican), and about 50 pounds per capita higher than southeast region communities (Tlingit, Haida, Euroamerican); however, because of the variation within each region’s communities, statistically these groups are not distinct. Pacific Gulf harvests are about 50 pounds per capita lower than Southwest Alaska communities (Aleut and coastal Yup'ik); again this difference is not significant statistically. The subsistence sectors of the Gulf of Alaska communities are significantly lower than that of the Yup'ik, Inupiat, and Athabaskan communities off the road network in the Interior, Arctic, and Western regions. Harvests in the Pacific Gulf are 175 pounds to 400 pounds per capita lower on average than communities in the Interior, Arctic, and Western regions.

Wolfe and Walker (1987) attributed these regional harvest differences to historic differences in degree of settlement entry by non-Native groups, presence of transportation systems (for people and goods), relative strength of the commercial-wage sectors in a community, and restrictiveness of fishing and hunting regulations. Overall, this current analysis suggests that the subsistence sectors of Pacific Gulf communities were moderate in size relative to other rural Alaska communities. They were neither at the low end or the high end, but fall somewhat in the middle of harvests of rural Alaska regions. In terms of wild food dependencies, the analysis also shows that Pacific Gulf communities in aggregate were statistically distinct from urban places in Alaska, including Valdez and Kenai.

The subsistence sector of rural communities can be described with respect to several features: resources used, harvest levels, participation rates, seasonality of harvests, harvest areas, harvest composition, kinship organization of production, distribution, and the expression of cultural values such as sharing and nonwaste. Each feature is described for Pacific Gulf communities, in order to characterize the subsistence-based economies as they existed just prior to the oil spill.

Resources Used and Harvest Levels

Subsistence hunting, fishing, and gathering were of great economic, social, and cultural significance in Alutiiq villages prior to the *Exxon Valdez* oil spill. Before the EVOS, opportunities to harvest and distribute natural resources in the subsistence sector of the local economies of these communities were generally more reliable than opportunities to earn money in the commercial-wage sector, since jobs tended to be seasonal and varied greatly in availability from year to year.

Case V-1 provides excerpts from a set of "community subsistence profiles" prepared by The North Pacific Rim (later renamed Chugachmiut), the non-profit Native regional organization for the "Chugach Region" (Prince William Sound and Lower Cook Inlet), based on research in the late 1970s. The profiles are consistent with division research beginning in the early 1980s. They illustrate differences between the villages and the larger communities that were borne out in division studies. For example, the community data on the range of resources used as summarized in Figure V-5 in Case V-1 should be compared with the following harvest and use data summarized from division studies.

Table V-5 summarizes information about subsistence uses in the study communities in the 1980s, based upon Division of Subsistence research. The same seven general categories of subsistence resources are available in the four regions, although there are some differences in the specific resources. These seven general categories include: (1) salmon (five species); (2) other fish such as halibut, Pacific cod, rockfish, herring, and Dolly Varden; (3) marine invertebrates such as clams, chitons, crabs, and octopus; (4) land mammals such as deer in Prince William Sound and the Kodiak Island area, black bear and mountain goats in Prince William Sound and Lower Cook Inlet, moose in Lower Cook Inlet and the Alaska Peninsula, and caribou on the Alaska Peninsula; (5) marine mammals (primarily harbor seals and Steller sea lions); (6) birds (including ptarmigan, grouse, waterfowl, and sea birds and their eggs); and (7) wild plants.

In the 1980s, subsistence harvests in the study villages were relatively large and diverse. For example, in the study years just before the spill (1987/88 and 1988/89), households in Tatitlek on average used 19.1 different kinds of wild resources (Table V-6). In 1987, households in Nanwalek used an average of 25.0 kinds of wild foods and neighboring Port Graham households averaged 21.5 kinds. Subsistence harvests in these communities ranged from about 200 pounds per person per year to over 600 pounds per capita annually. As shown in Figure V-6, subregional estimates of subsistence harvests in the 1980s were 254 pounds per person in Lower Cook Inlet, 287 pounds per person in Alaska Peninsula communities, 392 pounds per person in Kodiak Island villages, and 437 pounds per person in the two Prince William Sound villages, for a regional average harvest of 352 pounds per person per year. [Note that these averages exclude the towns of Cordova, Seldovia, and Kodiak.] That subsistence harvests provided a large portion of each community's food supply is shown by comparing these harvest

Case V-1. Chugach Region Community Subsistence Profiles 1980

English Bay [Nanwalek]. *"Subsistence is an integral part of the lifestyle of English Bay people. One could not begin to characterize village life without discussing the essential relationship between the people of English Bay and the natural resources around them. Harvesting fish, clams, berries, ducks and other game are year round activities crucial tot heir physical, mental and economic well-being."*

Eyak. *"Although different industries have encouraged the growth of a cash-based economy, the lifestyle of and the diet of people in the Eyak-Cordova area still strongly reflect the heritage of a traditional relationship between human beings and the natural resources. Because of the apparent lessening dependence directly on the resources there are those observers who would maintain that subsistence is no longer a reality in the Prince William Sound. Yes such activities as drying fish, smoking fish, seal-hunting and berry-picking have persisted over the years, without any direct relationship to the size of income. Traditional and customary uses of the resources continue."*

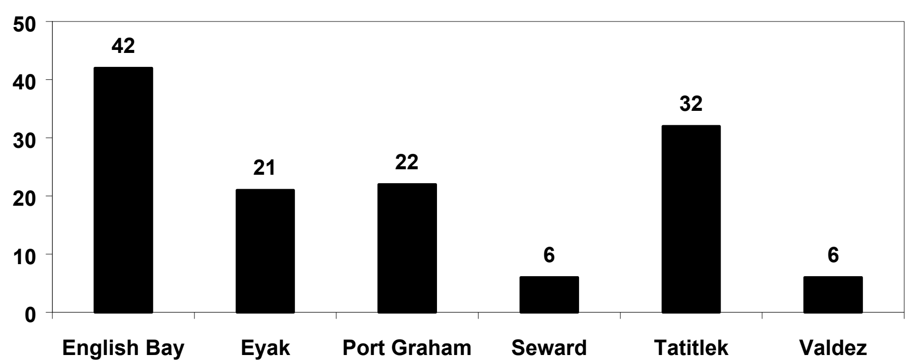
Port Graham. *"Residents of Port Graham continue to harvest and use natural resources, turning to the land and mountains for their subsistence foods throughout the year. Culturally and economically, subsistence activities and resources play a significant role in the lives of everyone in Port Graham."*

Seward. *"Subsistence in Seward is an entity that is difficult to define. Many local residents use the fish resources every year."*

Tatitlek. *"Natural resources are the cornerstone of the village economy, as the residents rely on commercial fishing and subsistence activities for their sustenance. Although the village has seen some significant changes over the years, the essential dependence of the Tatitlek people on the resources, culturally and economically, and their use of the resources, remains largely intact."*

Valdez. *"Valdez, among the Chugach Region communities, has the least apparent relationship to the natural resources. In spite of the many changes the town has undergone, and the influx of outsiders into the area, a segment of the community continues to utilize the natural resources, and many express concerns about the availability of the resources in the future."*

Figure V-5. Number of Resources Used by 50 Percent or More of Alaska Native Households, 1980



Source: The North Pacific Rim 1981

Table V-6. Some Characteristics of Subsistence Uses in the *Exxon Valdez* Study Communities Before the 1989 Oil Spill

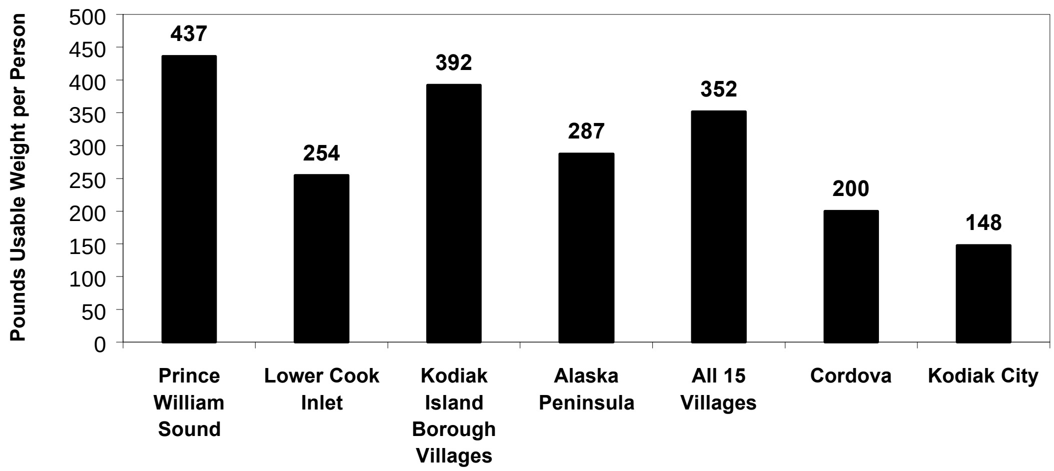
Community	Pre-spill Annual Average						
	Per Capita Harvest, Pounds	Mean Number of Specific Kinds of Resources Used per Household	Percentage of Households that:				
			Used Resources	Attempted a Harvest	Harvested Resources	Received Resources	Gave Away Resources
Predominantly Alaska Native Communities:							
Chenega Bay	346.6	18.8	100.0%	97.0%	97.0%	96.8%	87.5%
Tatitlek	483.4	19.1	100.0%	100.0%	100.0%	100.0%	97.7%
Prince William Sound	436.5	19.0	100.0%	98.9%	98.9%	98.9%	94.1%
Nanwalek	288.8	25.0	97.0%	93.9%	93.9%	93.9%	93.9%
Port Graham	227.2	21.5	100.0%	100.0%	100.0%	98.1%	81.5%
Lower Cook Inlet	254.3	22.9	98.8%	97.6%	97.6%	96.5%	86.3%
Akhiok	325.9	12.6	95.4%	90.7%	90.7%	56.5%	66.2%
Karluk	618.1	17.0	100.0%	95.1%	95.1%	97.3%	84.3%
Larsen Bay	309.5	15.4	98.5%	88.3%	86.8%	91.2%	72.2%
Old Harbor	456.3	15.2	100.0%	98.7%	98.7%	83.0%	78.7%
Ouzinkie	389.3	18.3	97.2%	94.2%	94.2%	85.3%	66.9%
Port Lions	307.2	14.0	99.2%	94.1%	94.1%	84.9%	75.9%
Kodiak Island Borough	392.1	15.4	98.7%	94.5%	94.3%	83.8%	74.4%
Chignik Bay	187.9	12.5	100.0%	84.2%	84.2%	94.7%	78.9%
Chignik Lagoon	220.2	10.4	100.0%	88.2%	88.2%	82.4%	70.6%
Chignik Lake	279.0	16.2	100.0%	100.0%	100.0%	95.7%	82.6%
Ivanof Bay	455.6	18.5	100.0%	100.0%	100.0%	100.0%	83.3%
Perryville	391.2	21.2	100.0%	100.0%	100.0%	100.0%	100.0%
Alaska Peninsula	287.0	15.7	100.0%	94.1%	94.1%	94.3%	83.5%
All Native Communities	352.0	16.9	99.0%	95.2%	95.0%	87.5%	78.3%
Other Communities:							
Cordova	199.9	12.6	98.7%	92.4%	90.0%	91.8%	83.1%
Kodiak	147.8	11.9	100.0%	NA	96.1%	90.3%	79.4%

[1] For Nanwalek and Port Graham, data pertain to 1987; for Chignik Bay, Chignik Lagoon, Chignik Lake, Ivanof Bay, and Perryville, data are for 1984; for Chenega Bay, data are the mean of values for two study years, 1984/85 and 1985/86; for Tatitlek, data are the mean of values for two study years, 1987/88 and 1988/89; for Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions, data are the mean for two study years, 1982/83 and 1986; for Cordova, data are mean for 1985 and 1988; for Kodiak, the study year is 1982/83.

Sources: ADF&G 2001; KANA 1983; Fall et al. 1995; Schroeder et al. 1987; Fall et al. 1996; Stanek, forthcoming a levels with average purchases of meat, fish and poultry in the United States. In the late 1970s, the average family in the western United States purchased about 222 pounds per person of meat, fish, and poultry. Subsistence harvests in the study communities nearly matched or exceeded this average. These subsistence harvests were also much higher than those of more populated, urbanized areas of Alaska (Wolfe and Walker 1987).

Case V-2 illustrates food preferences in the Alaska Peninsula community of Perryville in the 1980s. The diversity of wild foods used in this example matches Division findings from a systematic survey conducted in Perryville and the other four Alaska Peninsula villages in 1984 (Morris 1987). As Case V-3 (Akhiok) and Case V-4 (Old Harbor) show, however, the diets of village residents in the 1980s contained a variety of purchased foods as well, and "favorites" were not always "traditional."

Figure V-6. Estimated Subsistence Harvests by Subregion, 1980s



Participation Rates

As shown in Figure V-7 (see also Table V-6), virtually every household in each community of the spill area used subsistence resources in the pre-spill study years of the 1980s. A very large percentage, almost always 90 percent or more, engaged in subsistence activities and were successful harvesters. A large majority of community residents were involved in exchanges of subsistence resources, either receiving resources, giving them away, or both.

Case V-2. Favorite Foods in Perryville, 1985

"The most unusual, and diverse, meal the author had during the whole sequence of field visits [in 1984 and 1985] was the first meal on the second trip to Perryville. E.S. first served moose meat stew, followed by duck soup, then baked salmon. Something from the land, sky, and sea. Food bought in a store, such as spare ribs, beef stew, rice, and mashed potatoes also were eaten during the visits to Perryville. Homemade bread was a local item of pride. In an informal discussion of their favorite foods, nine persons cited subsistence foods – no one mentioned store-bought items. The range of favorites was extensive, with four people selecting caribou and two agutuk. Also included were steamed clams with seal grease, sea urchins, dried fish, ptarmigan, octopus, sea lion flippers, and berries. In a follow-up discussion about what was eaten the night before, many of the foods mentioned had been purchased; for example, one family had lima beans and ham hocks, and another, TV dinners. But answers in May included bear meat, caribou bones, and seal."

Source: Davis 1986:34-35

Case V-3. Continuity and Change in Foods at Old Harbor, 1985

"On March 27, 1964, the menus for 12 Old Harbor households (representing 104 persons) showed that four homes (36 persons) were preparing non-Native foods and eight households (68 persons) were preparing subsistence foods. The menus included roast duck, seaweed and wild spuds, sea lion, salted fish, salt fish soup, and clam chowder. During the field trip in March 1985 for this study, a small sample of 13 different meals served in 7 households (38 persons) indicated that local foods continue to be enjoyed, but the diversity has increased considerably with the introduction of purchased items. The local foods included fish patties, halibut, fried bread, piroke, and black bass; other meals had chicken, spaghetti, macaroni, hot dogs, pork chops, and hamburgers."

Source: Davis 1986:195.

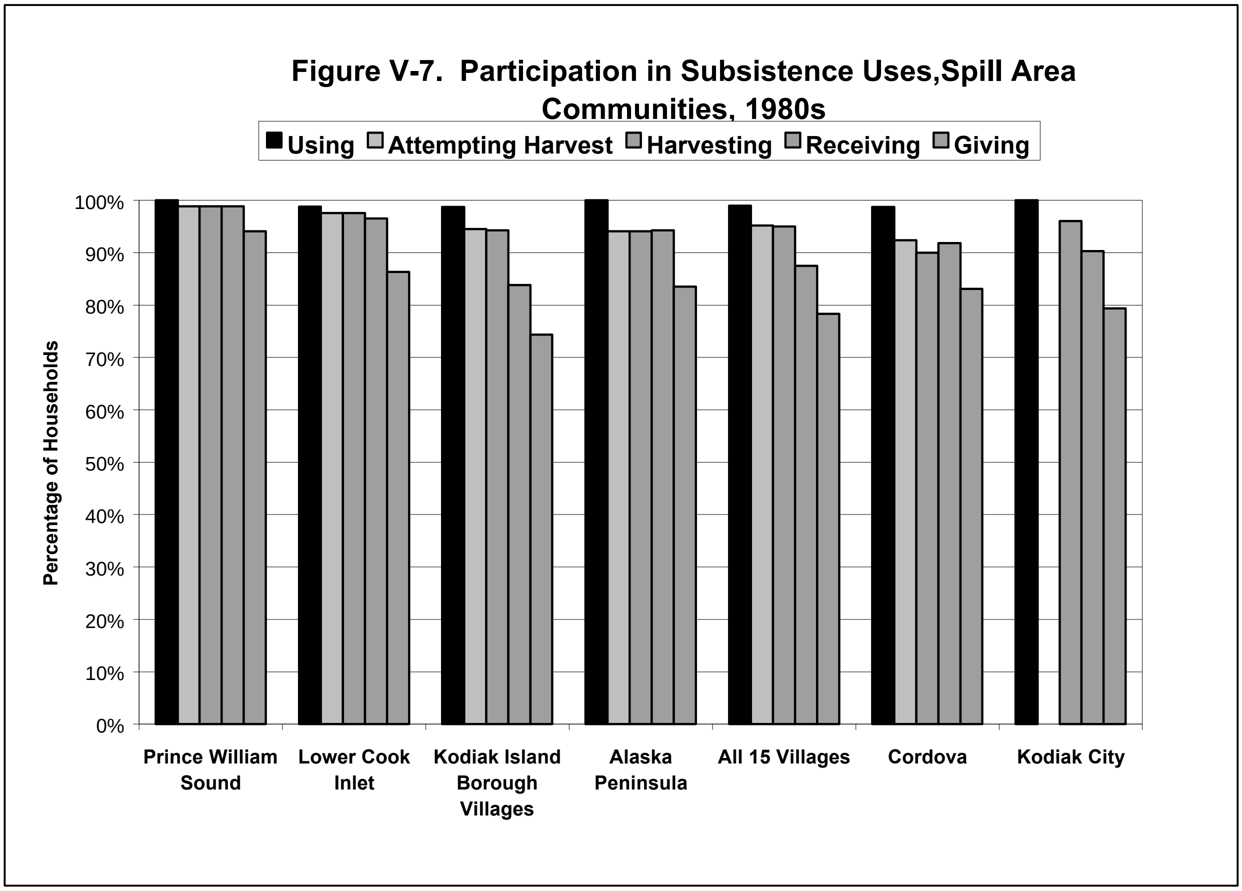
Case V-4. Increasing Availability of Purchased Foods at Akhiok, 1985

"Asking about favorite foods revealed diverse preferences among the residents of Akhiok. The subsistence favorites balanced choices purchased at the store, which included Chinese and Japanese dishes. The local foods named went from "Everything that comes from nature" to dried salmon, clams, seals, birds, and oomidak with seal oil. No land animal was identified as a preferred food. Data on 12 meals in 6 household (25% of the village) provided the following lists:

Item	No. of Households	No. of People
Subsistence Foods:		
Ptarmigan	2	8
Octopus	1	5
Canned Salmon	1	5
Purchased foods (the base for 8 meals):		
Chicken	2	6
Spam & cheese	1	7
Roast beef	1	5
Pork chops	1	6
Macaroni	1	1
Beans	1	1
Hamburger	1	4

"The above data contrasts markedly with the food eaten by the researcher in Akhiok on April 29 through May 2, 1979. At that time, the following foods were served: clams, pickled salmon, sea lion soup, smoked silver salmon, venison steak, fish pie, dried sea lion meat, and salmon loaf. In 1985 there was only one serving of subsistence foods – canned red salmon, and fried bread for a snack. Although the two experiences are not exactly comparable, the differences indicate that purchased foods were much more available, and consumed, in March 1985 than in May 1979."

Source: Davis 1986:168

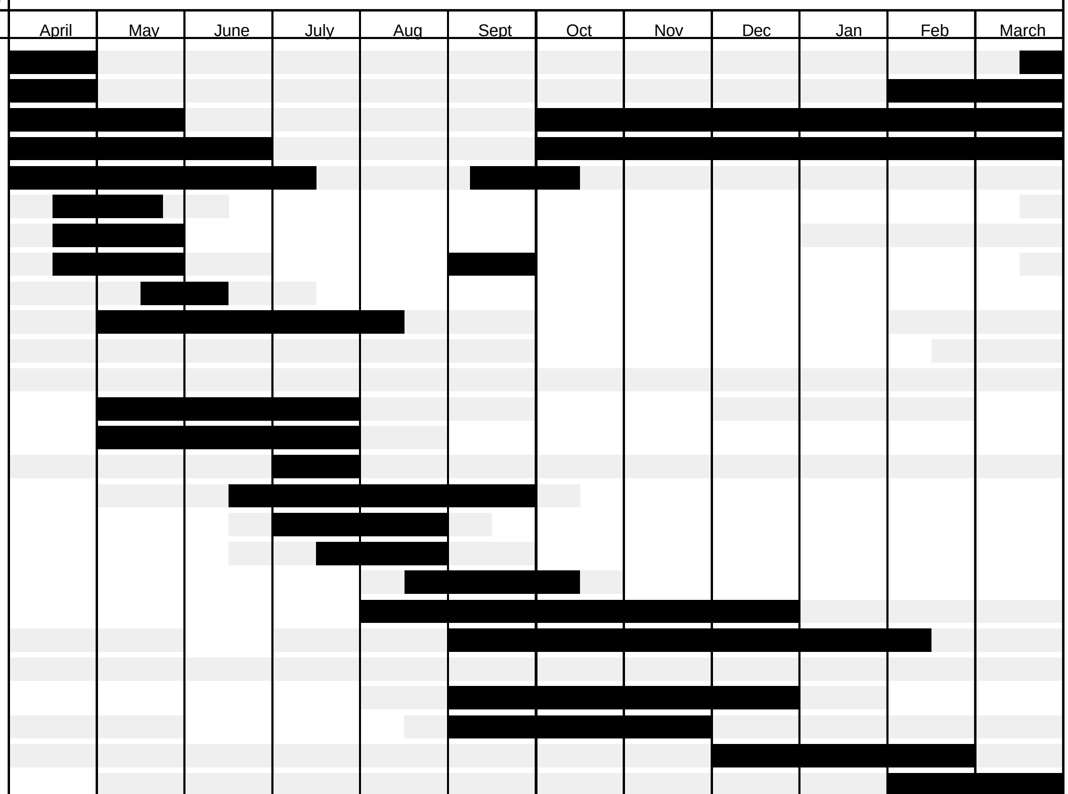


Seasonality of Harvests

In the 1980s, each community followed a patterned seasonal round of subsistence harvest activities that was shaped largely by the cycle of resource availability. Figure V-8 depicts the seasonal cycle of subsistence harvesting for the Prince William Sound communities of Chenega Bay and Tatitlek. Here, the cycle of subsistence harvests began in the spring (March, April, May). This was a period of renewed activities, when herring, herring spawn, clams, birds, eggs, and other resources were harvested. Summer was traditionally the busiest time of year, when people harvested and preserved large quantities of salmon for winter use. Autumn was also important for salmon fishing, as well as for land mammal hunting, marine mammal hunting, waterfowl hunting, and marine invertebrate gathering. Case V-5 illustrates the flexibility inherent in the seasonal round, as well as the traditional knowledge embedded in subsistence hunting. Subsistence activities in winter included marine mammal hunting, land mammal hunting, and trapping (Stratton and Chisum 1986:60; Stratton 1990:69). The skills and knowledge needed to hunt marine mammals, as well as the dangers involved, are illustrated in Case V-6.

Figure V-8. Seasonal Cycle of Subsistence Harvest Activities by Residents of Chenega Bay and Tatitlek, Prince William Sound, 1980s

Resource	% of HHs * Attempting to Harvest: Chenega	Tatitlek
Herring	16.1%	30.6%
Chitons	35.5%	19.6%
Harbor seal	67.8%	55.3%
Clams	51.5%	31.4%
Halibut	80.7%	57.5%
Herring Spawn	9.7%	71.5%
Smelt	25.8%	4.5%
Black bear	35.5%	9.6%
Seabird eggs	12.9%	39.2%
Cockles	29.0%	37.9%
Dolly Varden	12.9%	2.6%
Pacific Cod	19.4%	27.4%
King salmon	32.3%	50.6%
Sockeye	45.1%	62.8%
Shrimp	25.8%	26.1%
Wild Plants	90.4%	97.7%
Pink salmon	71.0%	72.6%
Chum salmon	54.8%	69.4%
Coho salmon	54.8%	57.3%
Deer	74.2%	75.3%
Crabs	9.7%	12.8%
Octopus	25.8%	47.5%
Goat	25.8%	14.1%
Ducks	64.5%	57.0%
Sea lion	51.7%	26.9%
Rockfish	54.8%	47.0%



■ = Usual Harvest (when most harvest occurs) □ = Occasional Harvest (when some harvest may occur)

* Average of pre-spill years

SOURCE: Fall et al. 1996

With mostly minor modifications, a similar seasonal pattern to that of Prince William Sound was followed by the communities of lower Cook Inlet, the Kodiak Island Borough, and the Alaska Peninsula. An important difference was the large numbers of caribou on the Alaska Peninsula, which were harvested from August through April (Morris 1987:86-92; Schroeder et al. 1987:404-405,474-479,582-583).

Case V–5. Duck Hunting on Kodiak Island

At the same time that men go out to hunt deer and elk, they usually take along a shotgun and hunt ducks. On a day when deer don't show themselves, hunters will turn their attention to sea ducks, which winter over in the protected waters of the Kodiak archipelago. One favorite place to stalk and shoot ducks is on the flats. Flats are level areas dotted with small fresh water ponds, and the tall reeds make good cover for the hunters if they crouch down. Surprisingly, stormy weather is prime time for duck hunting. This is because ducks take shelter during a storm and hole up in small lagoons or along creeks where they can be out of the wind. Hunters know these lagoons very well and are willing to brave the elements to get to them. Some areas can be reached more easily on a 4-wheeler than in a skiff. In the fall time TS and his son, "J.R.", always go up to their old family place at Barabara Cove, in upper Kizhuyak Bay, about fifteen water miles from Ouzinkie. They are often joined there by T's brothers, M, and P, who also have their own cabins. For many generations this has been their family's traditional deer and duck hunting camp.

Source: Mishler 2001:148

By the 1980s, the former seasonal pattern of dispersing to summer and/or winter camps continued for only a few communities and families. The greatest seasonal movements took place on the Alaska Peninsula, where the entire population of Ivanof Bay and about half of Perryville and Chignik Lake moved to summer camps on Chignik Lagoon or Chignik Bay for subsistence and commercial fishing.

Harvest Areas

Most often, subsistence hunting, fishing, and gathering occurred within definable village harvest areas, which sometimes correspond closely to the territories of ancestral Alutiiq regional groups (Fig. V-9). For example, the contemporary core harvest areas used by Tatitlek within Prince William Sound were much like those used by the *Tititlarmiut* regional group from which Tatitlek families are descended (Stratton 1990:87). As subsistence activities occurred, hunting and fishing skills, and knowledge about local weather patterns, reliable harvest areas, and safe camping locations, were taught across generations. The use of a wide array of mammal, bird, fish, marine invertebrate, and plant species reflect the detailed knowledge of local harvest areas that has developed and been transmitted over generations of subsistence activities.

Case V–6. Hunting Sea Lions at Old Harbor

R had to go to Kodiak at the last minute, so S picked me up at the Sitkalidak Lodge about 7:45 a.m., and we walked down to the small boat harbor to launch R's tiny skiff, a 14-foot Boston Whaler. We got to the Cape about 8:15 a.m., quite a long ride. As we rounded a big rock outcropping we saw about a half dozen sea lions perched up high sunning themselves. Then on the beach there were 70-80 of them in a good-sized herd.

As we approached, S expressed concern for the swells, saying he was reluctant to go in too close for fear of being swamped by the swells. So he hooted like a bull sea lion, took aim on an animal and showed me which one he was aiming at so that I could focus my video camera on it. He fired one shot with his rifle, a .243 Winchester bolt action with scope, but missed. The noise caused the whole herd to stampede into the sea, and we had them charging right towards us. The bulls came very close to the skiff with their heads out of the water, and S was quite nervous about them attacking us, but mainly they just circled around.

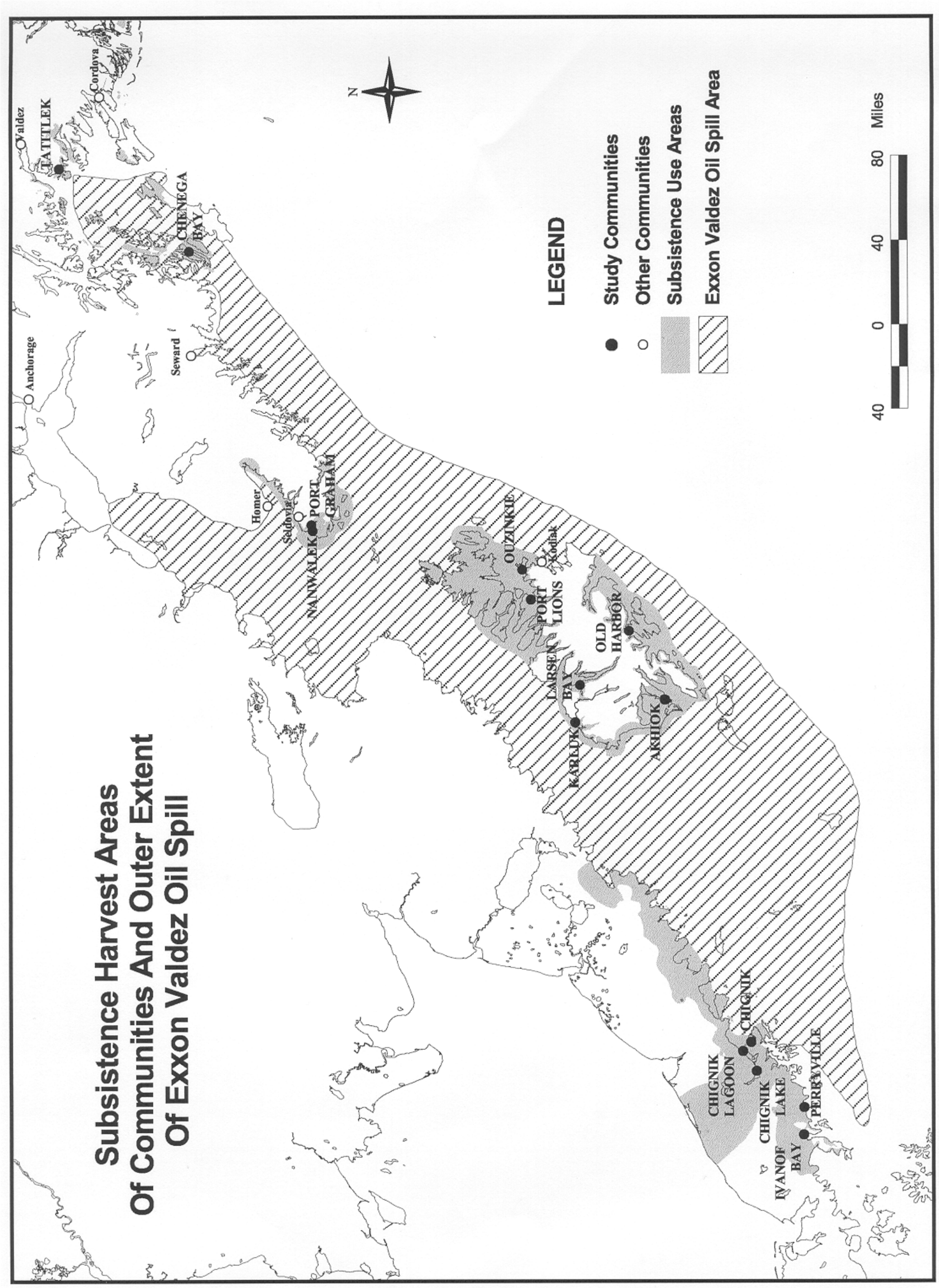
S, who only has one good eye, got off a second shot at a young one, but missed that one also. Every time he stood up to take a shot, they would dive. He wanted me to shoot, but I had no confidence in my ability to handle the gun, and reminded him that only Natives could shoot marine mammals. We moved farther around the Cape to locate another haul out but couldn't find any more animals. So we returned to the first location, but none of the animals had hauled out again, so S suggested picking off one of those sitting up on the rocks. Yet to get a good steady shot, he felt we needed to get out of the skiff and stand on one of the rocks. We located one and motored slowly up to it, and I jumped out with the camcorder and the rifle, while he tied up the skiff.

I climbed up high and positioned the camera, while S lay in a small crevice in the prone position to get his shot off. He picked a young one that was just below a giant bull perched on top of the rock and squeezed off a shot, which hit. S thought he had missed the sea lion, but I assured him I saw it fall as I looked through the camera viewfinder, and we pulled up close to the rock to see if we could find it in the water, but couldn't. I was ready to give up, but S finally spotted it sitting on a little ledge, where it was neatly camouflaged. Its skin was almost the identical color of the rocks around it. It was only distinguishable by its rounded features.

S said he didn't want to leave the skiff to go after it and suggested I climb up and roll it down to him. I said "O.K." but recommended we land on the back side of the rock where it was more level and easier to get out. So I jumped out on the backside and climbed around to the front side of the rock to find the dead sea lion, but on the way I ran into two more big sea lions which I had to avoid. After jumping across tide pools and steep crevices I found the animal but had great difficulty trying to move it. I finally found that moving the head worked best, and since I had gravity on my side, I told S to pull the boat up into a certain spot, so I could slide it down to him. It took virtually all of my strength, but I finally did get it to flop right on the front deck of the whaler. We motored over to Table Island to gut out the animal, but S was also more interested in picking up a seal. He spotted several on the backside of the beach in the water but couldn't get a good shot off. He also took up a position where he could watch both sides of the beach at once. He says this beach used to be covered with seals, but there were none there today. We ate sandwiches and drank coffee that S had thoughtfully brought along, and then S gutted out the sea lion--a young female. We loaded the sea lion back on the skiff and headed for Midway Bay and Big Creek, which flows into it, to look for the beach seiners.

Source: Mishler 2001:160-162

Figure V-9.



Subsistence Harvest Areas
Of Communities And Outer Extent
Of Exxon Valdez Oil Spill
LEGEND
Study Communities
Other Communities
Subsistence Use Areas
Exxon Valdez Oil Spill Area
40
0
40
80
Miles
N
Anchorage
Valdez
Cordova
TATITLEK
CHENEGA BAY
Seward
Homer
Seldovia
PORT GRAHAM
NANWALEK
OUZINKIE
Kodiak
PORT LIONS
OLD HARBOR
LARSEN BAY
KARLUK
AKHIOK
CHIGNIK
CHIGNIK LAGOON
CHIGNIK LAKE
PERRYVILLE
IVANOF BAY

Subsistence harvest areas are also documented in Alutiiq place names. Stanek (1985:122) depicts the distribution of Alutiiq place names in the vicinity of Nanwalek and Port Graham. He notes that, "The distribution of Native names provides an index of the extent of environmental knowledge and traditional land use by area residents living today" (Stanek 1985:124). This set of names includes mountains, islands, bays, historic village sites, hunting camps, fish camps, seal and sea lion haul-outs, clam beds, and bear denning sites. Also, names of landmarks along shorelines and trails provide guidance for travel and reference points for locating campsites, travel routes, and subsistence harvest areas.

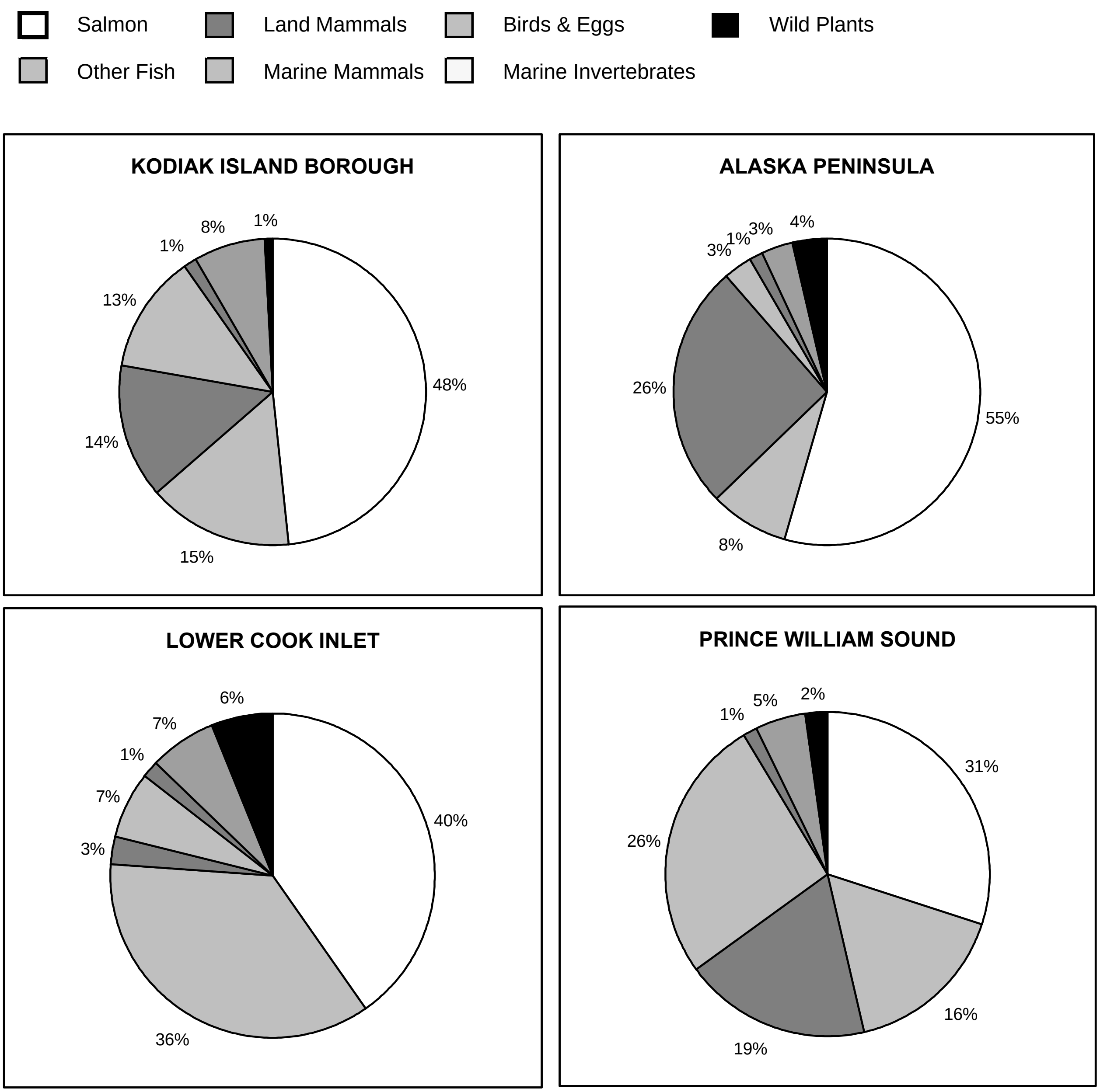
Within the hunting and fishing areas of particular communities, subsistence hunters and fishers recognized a system of usufruct land and water use rights. There was sometimes a village-level acknowledgment of rights to use particular drainages or fishing sites. Stanek (1985:123) describes the system in place at Nanwalek and Port Graham in the 1970s and 1980s:

> At the individual level, fishermen at Port Graham had subsistence and commercial set netting sites that were recognized as "belonging" to each individual. Among hunters, a similar but less site-specific system applied. A bear hunter and his partners who annually hunted a general area could usually depend on other hunters not using that area. This was particularly true if the hunter had a cabin or camp in the area. Similarly, hunters from Port Graham did not use the English Bay River drainage for bear or moose hunting unless a close relative and hunting partner from English Bay hunted there also. This latter situation existed to a small degree with most resource uses. Therefore, in the generalized outer boundaries of community use areas, no difference occurred with regard to the limits of the areas used by Port Graham and English Bay residents. However, significant differences did exist with regard to the number of residents from one village or the other using certain areas.

Harvest Composition

Figure V-10 illustrates the composition of subsistence harvests in the villages of four subregions in the 1980s by seven major resource categories based upon usable weight. In all regions, the composition was relatively balanced in that in no one resource category contributed more than half of the total useable pounds (the exception was that salmon contributed 55 percent of the Alaska Peninsula harvest). Overall, fish made up the largest portion of each region's harvest -- 47 percent in Prince William Sound, 63 percent in the Alaska Peninsula communities, 63 percent in the Kodiak Island Borough, and 76 percent in Lower Cook Inlet. Salmon contributed the largest portion of the total harvest in each subregion. Of all subregions, Prince William Sound had the largest marine mammal harvest (26 percent). Land mammal harvests were highest on the Alaska Peninsula (26 percent). Marine and intertidal resources contributed the vast majority of the subsistence harvests in every region.

FIGURE V-10. COMPOSITION OF SUBSISTENCE HARVESTS BY REGION, 1980s



Source: ADF&G 2001

Kinship Organization of Harvesting and Processing

Kinship shaped the composition of subsistence harvesting and processing groups in Alutiiq villages in the 1980s. Extended families typically worked together to harvest and process wild foods. These family activities provided the context in which young people learned the skills and values linked with the subsistence traditions of their communities. Case V-7 describes processing of subsistence salmon at Old Harbor. Case V-8 and Case V-9 illustrate how kinship was a critical factor in subsistence salmon fishing and processing in Nanwalek and Port Graham in the early 1980s. Case V-10 shows the key role that women play in both processing and harvesting wild foods. Figures V-11 through V-15 are photographs of subsistence harvesting and processing activities in several Alaska Peninsula villages in the early 1990s. Participation in subsistence uses and harvesting was virtually universal in Alutiiq villages before the spill. Almost every household used wild foods, and the vast majority attempted to harvest and successfully harvested subsistence resources (Table V-6).

Case V–7. Processing Salmon in Old Harbor

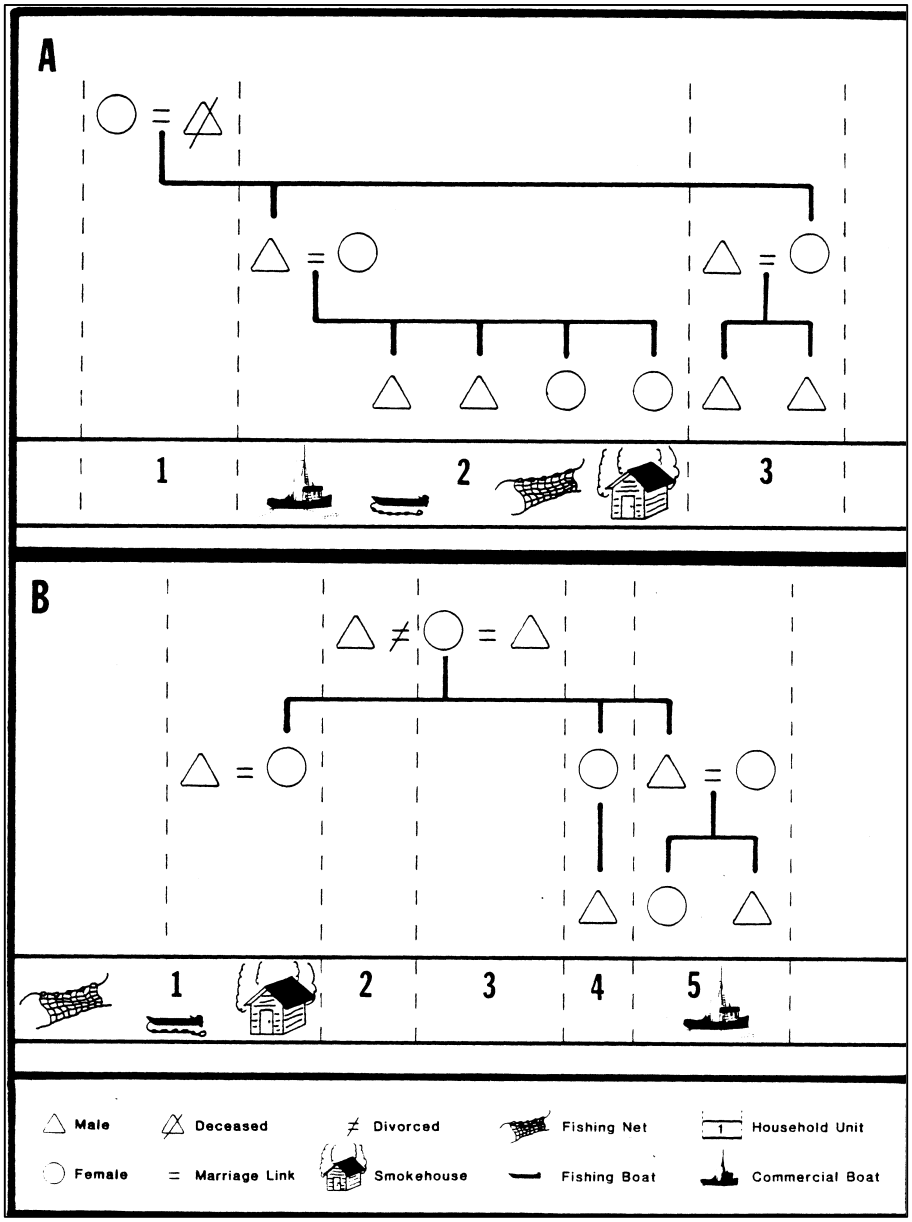
I wandered down to the beach near the lodge and found a whole bunch of people splitting fish--mostly [family] C but others as well. They offered free fish to everybody who came by, including me, and talked about "feeding the whole village." After watching for a few minutes I asked permission to go get my video camera and they said O.K.

The weather was sunny and calm, and it was a joyous activity to observe with dogs and four wheelers running all over. The fish cutters paid hardly any attention to me or the camera and kept up a lively chatter that included several personal experience stories and discussions of various methods of preserving and putting up their fish.

Most people worked on their hands and knees in front of a huge pile of silver salmon which someone had brought back from Big Creek. Some Alutiiq was spoken by the elders. I used my tripod and captured 30 minutes of delicious footage. OC, speaking of subsistence off camera, said, "It ain't nothing but a lot of hard work." Learned that MH and WB are sisters to HC. M was putting fish heads into a white 5-gallon bucket.

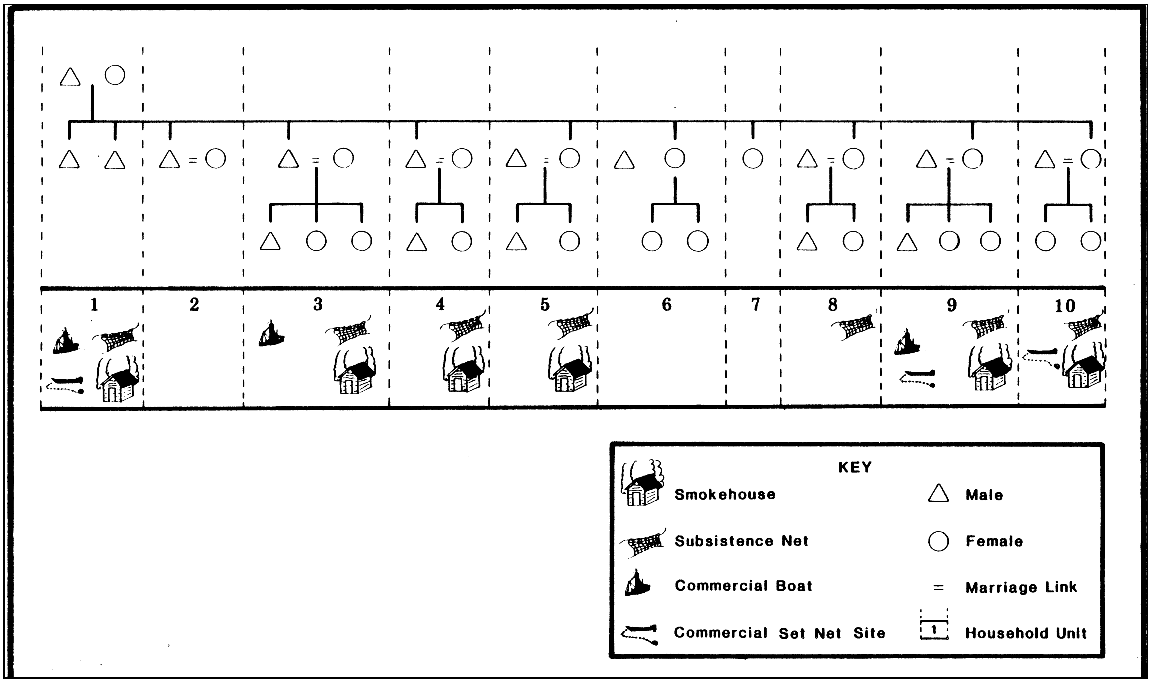
A and JZ's skiff came in. A disappeared someplace, but J said they just came back from Big Creek and got nothing because the fish had all moved up the creek overnight. This foiled George's plans to take me up there this afternoon and illustrates the importance of timing.

Source: Mishler 2001:171



Case Example V-8. Two Lower Cook Inlet Village Salmon Fishing Groups, early 1980s

These two extended families harvested and processed salmon separately but consolidated during other social and work activities. The male household head in A-3 is a “distant cousin” of the female in B-1. In Kinship Group A, the father, two sons, and one daughter in HH A-2 harvested the salmon. Family members gathered at the smokehouse owned by A-2 to process the fish; women mostly accomplished this. In Kinship Group B, the man in household B-1 harvested most of the fish himself in two or three days of fishing. All the households helped with the processing, although the mother in household 3 was in charge, deciding how much fish was made into various products. The men in Households A-2, B-2, and B-3 worked together as crewmembers on the commercial seine boats of households A-2 or B-5. They socialized by playing cards, watching TV, taking steam baths, or sharing meals. During these social functions, they shared salmon products. [Adopted from Stanek 1985:135-138.]



Case Example V-9. An Extended Family at Port Graham that Cooperated in Subsistence Salmon Fishing and Processing, early 1980s

This case involved 37 extended family members in 10 households. Four of the ten households fished commercially. For subsistence fishing, members of all ten households fished together, and shared the harvests, processing tasks, and salmon products. Setting and tending nets was usually the job of young men. The elder woman in Household 1 directed the distribution of the harvest to extended family households. She assisted her children in the other households in processing the catch. This woman also directed her children who commercial fished to provide salmon to those family members who were unable to harvest for themselves. [Adopted from Stanek 1985:131-133.]

Case V–10. Women and Subsistence in Port Graham

"Subsistence happened year-round, it wasn't just in the summer and fall. I remember the beach below my grandmother's house. We went down and picked *taugtaaq* (cockles) there and then mussels (*amyak*), "old maids," we called them. We baked those in the oven - a kind of clam - soft shell clam. And we would get snails and bidarkies and lady slippers even *ciilerpak* (bullhead) in the tidal waters fairly decent sized ones and *egalukii* (cook) them. Sometimes there were so many cockles down there she would string them up in the *ciqlluaq* (smokehouse) and smoke them before she would cook them. She'd have them hooked by hanging from string, and put a little smoke on them and cook them. In her *ciqlluaq* she had several stomachs hanging there with various things in them. She had oil in them, berries stored in them, she had cockles and clams in *uguq* (oil) in the *aqsaquq* (seal stomach container). Then she would make a cheese made out of salmon eggs. She would press all the water out of it and let it drip and all the casings from the fish eggs would float to the top and she would keep pressing it.

"Our women did lots of subsistence, our men did too but the men would be gone during the summer months, the majority of them. So it was up to the women to put up the basic part of the subsistence food, and it was all because we didn't have electricity. It (fish) was either dried or salted, so a lot of fish were dried during the summer months, and all us kids were involved in that. I remember spending days and days with my grandmother carrying fish home and helping her clean it up and drying it. We dried it under the docks too. We would hang lots of it."

Source: Stanek 2000: 59 and 57

Sharing of Wild Foods

Most harvesters shared portions of their subsistence takes with other households. Such sharing most frequently took place along lines of kinship. In a case study from Nanwalek (a typical example), one harbor seal was shared among 25 people within an extended family of eight households (Stanek 1985:170-171). Two additional examples are provided in Cases V-11 and V-12. In addition to sharing with relatives, subsistence foods were regularly shared with the elderly and other persons in need.

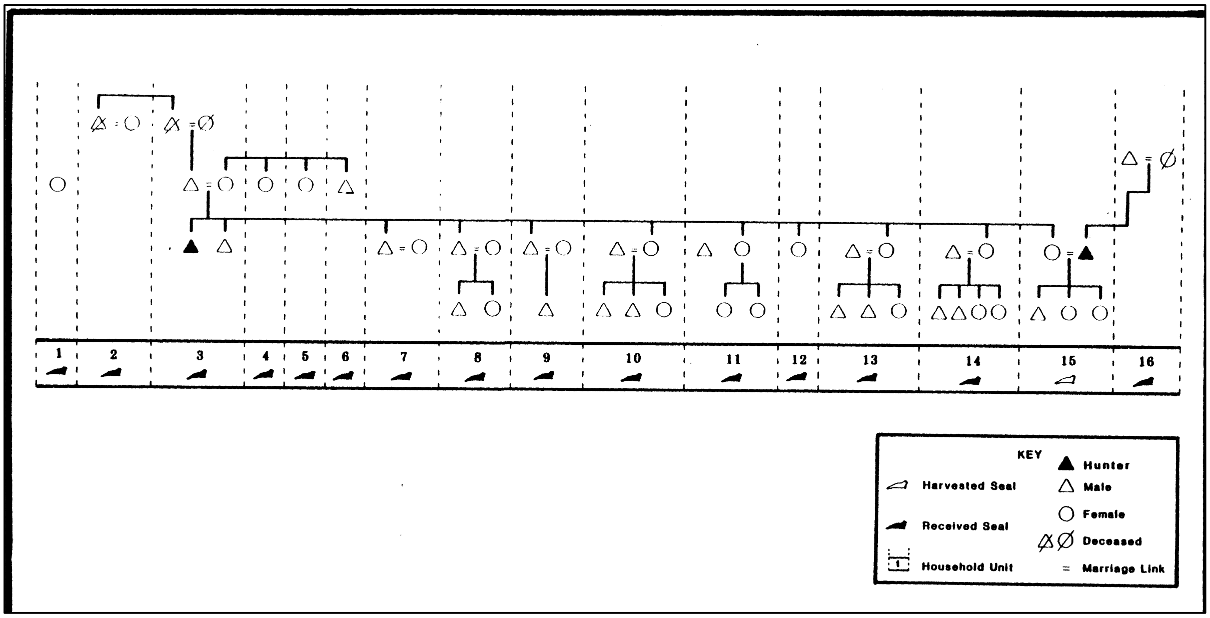
Figure V-11. Beach seining for subsistence salmon, Kametolook River, Perryville, Alaska Peninsula

Figure V-12. Cleaning and brining subsistence salmon prior to smoking and freezing, Ivanof Bay

Figure V-13. Preparing wood for smoking salmon, Chignik, Alaska Peninsula

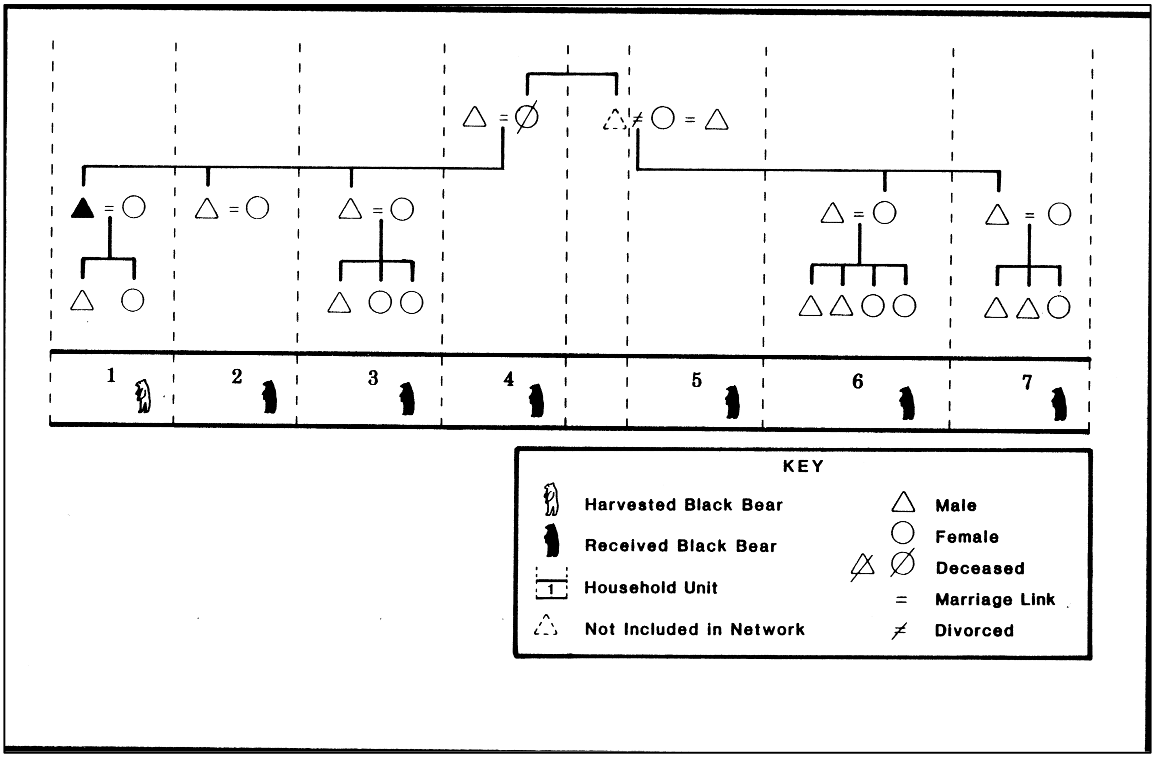
Figure V-14. Digging butter clams at Chignik Lagoon, Alaska Peninsula

Figure V-15. Subsistence harvest of Cockles, Ivanof Bay, Alaska Peninsula



Case Example V-11. An Example of the Distribution of Harbor Seal at Port Graham, early 1980s

In this case example of the sharing of subsistence resources, two Port Graham hunting partners (Households 3 and 15), who were also brothers-in-law, distributed seals to 16 households with 45 people in three communities (Port Graham, Nanwalek, and Seldovia). Because they are highly valued for their taste and nutritive qualities, seal meat and fat were the most widely distributed of any resource in these Lower Cook Inlet communities. This case probably illustrates the maximum observed size of a sharing network. The two hunters shot and field-dressed each seal, cutting it into smaller pieces for distribution. Each seal was distributed to three or four other households (in addition to those of the hunters) in the extended family. When another was taken, it was distributed to a different subgroup within the network. Note that all the households in this example were linked by kinship except Household 1. This household had no immediate kin in the villages and was provided for by these and other hunters. [Adopted from Stanek 1985:170-173.]



Case Example V-12. An Example of the Distribution of Black Bear at Nanwalek, early 1980s

Distribution of bear meat and fat follows lines of kinship. In this example, sharing of a bear harvested by a hunter in Household 1 involved 25 people in 7 households. Bear products are in high demand in Nanwalek and Port Graham; they are considered about equal to harbor seal in food value. Bear meat is cooked in roasts and stews. Bear fat is considered the best for baking and cooking after it has been rendered into lard. There were about 14 hunters in the two villages who regularly hunted bears in the 1980s. Sharing among hunters' families and friends is extensive. Some hunters tried to harvest several bears per season in order to meet their household's needs as well as provide for other community members. Initial sharing took place primarily between hunting partners, with secondary distribution to friends and relatives. Because a single bear does not provide a great deal of meat, distribution of one animal could not involve many households. Hunters distributed subsequent bears to people who had asked for meat or fat and did not receive some from previous bears. [Adopted from Stanek 1985:180-182.]

Cultural Knowledge and Values

In the sphere of subsistence, activities are guided by a complex system of knowledge, beliefs, and values. An example of the ideational systems embedded within subsistence uses are the contemporary names of many subsistence products. Alutiiq terms are used to designate many resources or food products, even though English was the primary language used in most communities by the 1980s. For example, "oodiks" (Alutiiq *uutuk*) was the name frequently used for sea urchins, and snails were commonly called "*ipuk*" in a few villages. At Nanwalek and Port Graham, bottom-dwelling animals such as crab, which are found in shallow waters of bays and intertidal areas, are called *uyangtaaq*. These intertidal animals are conceptually placed in this single-named category because they can be harvested by people of various ages and abilities at times of the year when other resources are scarce or when poor weather prevents extensive travel. Traditional food items commonly retain Alutiiq names. For example, *tamuuq, uumatak,* and *ataneq* are products made from dry salmon that are staples in each community's diet. *Piinaq* are dried fish eggs (Stanek 1985:141). The nutritional and cultural significance of dried salmon and halibut is so great that at Nanwalek and Port Graham these foods are called "our bread" (Stanek 1982:20-21). Case V-13 provides parallel examples for the Kodiak Alutiiq communities.

As illustrated in Case V-14, community residents blend the old and the new in preparing traditional foods. Case V-15 illustrates the particular value residents of Kodiak Island Borough villages place on their "brand" of duck soup. As shown in Case V-16, traditional foods have medicinal as well as nutritional values for the Alutiiq.

The cultural importance of subsistence in the 1980s was evinced by the traditional knowledge about animals, plants, geography, and weather that was communicated during subsistence activities. For example, young women at Tatitlek learned how to identify ripe herring eggs and the appropriate kelp to harvest them on as they accompanied their mothers and grandmothers in the spring to herring spawning areas (Stratton 1990:101-103). A key element in the resettlement of Chenega Bay in 1984 was the teaching of hunting and fishing areas to younger men who had been absent for two decades; the teaching was conducted by older, former residents of Chenega (Stratton and Chisum 1986:111-116). Local place names, in either Alutiiq or of non-Native language origin, often do not appear on maps and must be learned during subsistence activities. Local names are generally concentrated at prime subsistence use areas (Stanek 1985:122).

Special knowledge and traditions apply to certain subsistence pursuits, such as the hunting of brown bears. Traditions such as described in Case V-17 link Alutiiq hunters to their cultural heritage and are taught to promote respectful harvest and use of wild resources.

Case V–13. Local Fish Recipes in Ouzinkie and Old Harbor

1) *Pirok*. Fresh or salt salmon *pirok* is a traditional Alutiiq food that may be thought of as a fish pie, but *pirok* can also made by substituting corned beef in place of salmon. Roll out a sheet of pie crust dough, insert it in a large baking pan, and add a layer of cooked white rice, a layer of stir-fried vegetables (which can include carrots, onions, green pepper, cabbage, and rutabagas), a layer of fresh sockeye salmon, another layer of vegetables, another layer of cooked white rice, and optionally a layer of something else, like hard boiled eggs. Cover ingredients with a top crust of more pie dough and bake in a 350-degree oven for about an hour and 15 minutes. TS cuts the outline of a three-barred Russian Orthodox cross into the top crust before baking. One of T's *piroks* made on May 14, 1997, fed fourteen people with lots leftover.

2) *Piroshkis*. Stuff large dinner rolls with cooked or canned salmon and rice or corned beef and rice. Fried vegetables are optional. Herman says the old way of making these, as learned from his father, was to use a heavy piecrust dough rather than yeast-leavened bread. Piroshkis are a lot like piroq.

3) Fish hash. Chop up any kind of fish and pan-fry it with cooked potatoes.

4) Boiled salmon. Boil water with onions and bacon and lots of Johnny's Seafood Seasoning. Then add potatoes, and when the potatoes are almost done, toss in the salmon steaks. They will be done in just 3 or 4 minutes. The broth is really good too.

5) Boiled fish heads and roe (A's favorite).

6) *Sikiaq* (half-smoked salmon). Put some fresh salmon fillets in a salt brine for an hour or two. After removing the salmon from the brine, cold smoke the fish for one to three days, using a mild wood, like cottonwood. Top the fish with sliced onions, margarine or butter, and bacon, cover, and bake slowly for about 30-40 minutes in a low oven.

7) Halibut chowder. Toss chunks of fresh halibut into a big pot of boiling water and thicken with carrots, macaroni, rice, potatoes, and onions. Season with Johnny's Seafood Seasoning.

Source: Mishler 2001:181-182

Case V-14. Traditional Alutiiq Foods with a Modern Twist

The blending of the old and the new is illustrated in the choice of foods available at an impromptu "potluck" supper attended by Kizzia (1991: 4) at Nanwalek in the late 1980s. Among the choices were "salmon pie," "Shake and Bake tomcod," and "bidarkie salad." In each case, a wild food product had been prepared along with more modern ingredients such as piecrust and rice, a pre-packaged seasoning mix, and some imported greens.

Case V–15. Duck Soup in Kodiak Island Villages

To make a good duck soup you have to have fresh sea ducks, because what makes the soup so good is the duck's fresh blood. Duck soup with lots of blood in it tastes a lot like a broth made from harbor seal meat. Freshwater ducks can be used for soup, but they do not have much blood in them. Saltwater ducks include all of the scoters, harlequins, oldsquaws, and mergansers. Freshwater ducks include mallards, buffleheads, goldeneyes (both Barrow's and common), widgeons, gadwalls, green-winged teals, and scaups (aka bluebills)

Source: Mishler 2001:152-153

Case V–16. Ptarmigan as Food and Medicine in Old Harbor

In addition to ducks, Alutiiqs also enjoy eating other birds, some of which have medicinal as well as nutritional value. When I asked WE Sr. (1997) what his favorite Native food is, he responded:

I like ptarmigan because I guess it's almost impossible to get, but that's my favorite, is ptarmigan. Because that's what I was raised on, and my belief is that ptarmigan is a good medicine. We had no doctors. My Mom was the doctor. Dr. Mom, they called her. But that's what we use if you had a fever or anything, we'd always have ptarmigan, boil it and just drink the water, and this ptarmigan has all the herbs, and all the good stuff that comes out of meat, in the ptarmigan. Every time you have ptarmigan juice like that, boil the daylights out of it, and drink that and you'll get well, believe me. I believe in that. . . . Well, we take what we can get, you know. I even ate seagulls back when we couldn't get anything else. And the reason why we had that, we had no money to buy shells, so we'd take salt salmon and put it on a hook, and the seagull would eat the salt salmon, and we'd get our meat that way, from the seagull.

Source: Mishler 2001:154-155

Case V-17. Ritual Treatment of Bears

Bears taken for subsistence use continued to be handled in a special manner in several of the study communities into the 1980s. In the Alaska Peninsula communities of Chignik Lake, Perryville, and Ivanof Bay, a set of rules governed hunters' behavior before, during, and after the hunt. For example, traditional hunters left the hide and skull of the bear at the harvest site, orienting the skull to the south or southeast. "That's for thanking their brothers and family and ancestors that they got a bear." Successful bear hunters poke out the eyes and push them up the nostrils "so the bear won't see or smell us;" drive a sharp stick into each ear "so the bear won't hear us;" cut the jaw "so the bear won't bite;" and cut the tendons on the bear's paws "so the bear will not hold you and maul you." Into the 1960s, young men were formally initiated into brown bear hunting at Chignik Lake; similar traditions have been recorded for Kodiak communities before subsistence bear hunting was virtually eliminated by regulations. Somewhat similar sets of cultural rules governed black bear hunting at Nanwalek and Port Graham, and were recorded by Birket-Smith (1953:37-38) for Chugach of Prince William Sound as well. These traditions likely preserve those practiced in all Alutiiq communities at one time and are part of a more widespread complex of traditions associated with bear hunting in the circumpolar north.

Source: Fall and Hutchinson-Scarbrough 1996

Summary: The Subsistence Sector of the Local Economy

The vitality of the subsistence sector of the local economy of the villages of the North Pacific Gulf region in the 1980s is demonstrated by the links community residents made between the harvest and use of wild resources and their cultural identity. The following examples derive from testimony to the Alaska Native Review Commission in 1983 (Berger 1985).

> I don't know how anybody can place [a] value on my Nativeness, who can place the value on my thinking, my spirituality. I don't think anybody can. Only myself, and I think each and every one of us need to remember that we are Native and that we need to value that and protect it . . . through protection of our lands and our lifestyle. [Port Graham]
>
> Everybody is subsistence here in the village. [Nanwalek]
>
> The Native people have way of life that has always been successful. [Tatitlek]

In testimony before the Commission, village residents also recognized the economic importance of subsistence harvests as a source of food in communities where jobs are scarce and cash incomes low.

> Our economic stability in villages is very bad. The unemployment is extremely high. There's no place else in the United States – and maybe in the world – where you're going to find such

unemployment statistics as you will in villages. We depend on the food that we get for ourselves. [Larsen Bay] (quoted in Berger 1985:58).

As Case V-18 shows, Native people were aware of and concerned about tremendous changes that had occurred. However, traditional uses of fish and wildlife continued. Case V-19 presents excerpts from an interview conducted by students with an elder from Tatitlek, which highlights the personal, historic, and economic importance of subsistence foods.

Case V-18. Perceptions of Change Despite Persistence of Traditions

"A young couple in [an Alaska Peninsula] community commented that, 'Our culture is really Americanized.' Interestingly, this household, which consisted of a husband, wife, and three small children, harvested 1,220 pounds of wild foods [in 1989], including halibut, gray cod, cockles, bidarkies, octopus, sea urchins, brown bear, caribou, ptarmigan, and gull eggs. They used 25 different kinds of subsistence foods, and shared eight kinds of resources they harvested with others. The husband described how he had produced 30 jars of brown bear fat from an animal he had taken that year, stating that his household preferred brown bear oil over seal oil for use with dry fish. The wife described how she braided seal intestines, stuffing them with fat. 'It's pretty gross to work with,' she said, 'But it tastes good. It's the best I ever tasted in a food. It tastes better than steak to me.' This example illustrates the strength of many cultural traditions in [Alaska Peninsula Alutiiq] communities today, even while self-perceptions may focus on cultural changes in the communities."

Source: Fall et al. 1995:221

As Case V-20 from Cordova illustrates, the meaning of subsistence was more ambiguous among non-Native people and among Alaska Natives living in the larger communities. In the late 1970s, McNeary (1978: 41) concluded that "the overall level of involvement in [subsistence] hunting and fishing activities does not appear to differ greatly for Cordova Natives and non-Natives at the present time." He noted "important values involved in hunting and fishing besides the purely economic" for both sub-populations. For the non-Native majority in Cordova,

The opportunities to enjoy the outdoors, to hunt and fish, to eat fresh foods such as salmon or crab, and the pleasures of distributing wild foods or receiving them from friends are very important in making the quality of life in Cordova what it is. These activities, plus the atmosphere of small town living, seem to be the main reasons why people choose to live in Cordova rather than in more urban areas (McNeary 1978:41)

Case V–19. The Importance of Subsistence

In an interview with high school students, Mike Totemoff, a village elder from Tatitlek, was asked, “How important is subsistence to the village life style?” He answered:

I’ll tell you - we don’t have no means of employment - going to the store to buy these $5.95 steaks when you feel like it - cannot go to the store any time you feel like it, when you don’t have an income or a job, you know. The way people subsisted here in Tatitlek, far as I know, I am 60 years old now, and they have always lived off the land, always hunted and fished everything we got. We had no refrigerators, no freezers, we hunted when the season was due, the fish were here, we took them when the bears were here, we took them when the animals were here, we took them, its seasonal.

We need that to live with, you know, that is the way we were brought up, that’s our life style. [We] cannot go to the grocery store, super market any time we feel like. Wish we could, if there were jobs available again, but in order to subsidize for the cash flow all this that was needed to buy all this stuff we got to go out and kill our own animals and kill our own meat and stuff, you know. So it's lot cheaper and better and we enjoy that, I enjoy it you know, because I am doing [it], go for a lot of the elders and every body else who needs meat. My dad he used to out and kill and load up the boat with deer from Montague and Columbia. Load up them little sea lions you know, baby sea lions, load up the whole boat up and bring it down to the beach and everyone would come down with a knife and take a sea lion. That’s subsistence use.

Mike added:

That’s one of the most important issues ever hit Natives of Alaska, subsistence. It’s very, very important that we fight. I depend on it all of the time. I eat seal meat and ducks, deer meat, bear. [It] was our subsistence way of lifestyle before. In early spring when the bears came out, in the fall we ate goat, then the deer started swimming out to the islands in the last 30 years or so, so we started eating deer, so that’s how we do now.

Q: Do you enjoy hunting and fishing or would you rather get your food in a different way?

Mike: Oh no, I enjoy hunting and fishing, it’s my lifestyle, and I like it, that’s what I do.

Source: Simeone and Miraglia 2000:63, 88

Regarding the significance of subsistence uses to the Alaska Native population in Cordova, McNeary (1978:41) concluded that all of the factors pertaining to non-Natives applied,

> With the addition of the psychological (and political) importance of freely using a land which they have inherited from their ancestors, and the great importance of traditional foods, particularly for the older people. For many of these foods, such as seal meat and oil, herring eggs, or chitons, there is no equivalent available in the grocery store. Such foods are keenly appreciated by the more traditional Natives, not merely because they please the taste-buds, but because they provide an immediate and powerful link to one's childhood and to past tradition.

Case V-20. Ambiguous Meanings in Cordova

"The word "subsistence" evokes a variety of responses in Cordova. I soon learned to avoid using the term as I found that the statement that I was "studying subsistence" often brought a response of hostility or, more frequently, incredulity. A few Whites consider themselves "subsistence" users on the basis of their heavy use of wild food. Others, however, feel that such use should be considered "income supplement" because of the general cash orientation of Cordova's economy. Given the opportunities for financial success in Cordova, many non-Natives seem to view economic dependence on wild food less as a "subsistence life-style" than as a lower-class life-style, a sign of failure in a cash economy which is seen as the only possible reference point. From this point of view, "subsistence rights" translate as "welfare hand-out" and are resented by people who fear that their own hunting rights could be jeopardized because of their non-Native ethnic origin or relative financial success.

"Most Natives are commercial fishermen, and a few see themselves as primarily involved in a cash economy, with little interest in "subsistence." Others are quick to point out, however, that commercial fishing offers only seasonal employment and uncertain income, so that use of wild resources gives an important margin of security. Moreover, the feeling is there, though it is often kept under the surface, that Natives should be able to continue all traditional subsistence activities unimpeded. As one man confided, in objecting to certain ADF&G regulations, "What are the people going to do? They are not going to starve!" Starvation, of course, is less of a problem than frustration with bureaucratic regulations which sometimes appear to be just one more of life's difficulties like bad weather or poor fish runs."

Source: McNeary 1978:42

CASH SECTOR OF THE LOCAL ECONOMY

General Features of Cash Employment

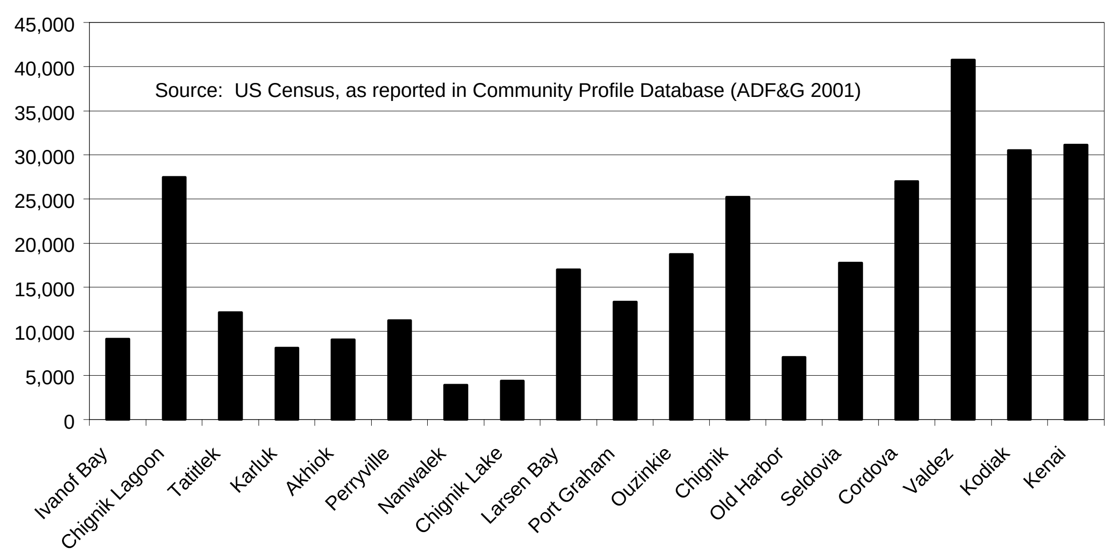
There were several general features of the cash sector of the local economy of the study communities in the 1980s. For one, employment tended to be seasonal. For example, in the newly reestablished community of Chenega Bay (Stratton and Chisum 1986:58),

> With employment primarily dependent on local construction and commercial fishing, most work was seasonal. Averaged across the employed population, 25 employed people worked 4.9 months per person per year in 1985-86, compared with an average of 6.4 months in the previous year (1984-85).

Another key aspect of the local economies was that they were dominated by commercial fishing. Describing the local economy of the late 1970s, Braund and Behnke (1980:209) noted that "commercial fishing and the Port Graham cannery provide the bulk of the year's cash for the majority of Port Graham and English Bay residents." Characteristics of commercial fishing in the study communities are described in the next section. We return to a discussion of the relative contribution of earned income, other income such as entitlements and transfer payments, and subsistence harvests in a later section of this chapter.

Generally, cash incomes were lower in villages than in the towns and cities. Figure V-16 reports data from the 1980 census (pertaining to 1979), reporting median household income for the villages, towns, and cities in the study area.

Figure V-16. Median Household Incomes, 1980



Case V-21 is a profile of the local economy of Nanwalek (English Bay) pertaining to 1979. The seasonality of employment is emphasized, as is the significance and reliability of the subsistence sector of the local economy in comparison with the cash sector. A contrasting example is provided in Case V-22, a profile of the Alaska Native population of Valdez, also pertaining to 1979. The summary stresses higher cash incomes and more employment opportunities than found in the villages, reflecting the growth of Valdez' economy in the 1970s with the construction and operation of the Trans-Alaska Oil Pipeline.

Case V-21. A Profile of the Cash Economy of Nanwalek, 1979

"A statistical profile of English Bay's [Nanwalek] income and employment situation would seem to underscore the importance of subsistence living as an economy for that village. Over half of the households report an annual income under $10,000, and some 80% of the households are under $15,000. Community reliance on local resources allows English Bay to remain economically viable despite relatively low cash availability.

"What cash flow there is goes largely to oil, electricity, groceries and fishing equipment. The average household in English Bay spent $1,000 on subsistence equipment in 1979. This included gas, fishing gear, ammunition and other essentials. Groceries account for roughly $465 a month of the average family's budget. Considering the large families, and paying Homer prices plus airfare, this does not go far.

"In type of employment as well, English Bay's fundamental orientation to subsistence patterns is telling. The majority of the households contain members engaged in seasonal work, often in fishing related areas, and approximately five out of six of the households have some members who list their occupation in the trades-craft designation of employment. The trades-crafts classification included fishing, construction, and logging employment, among other occupations. These three were the primary kinds of employment in English Bay, however. It is noteworthy that the predominant occupations are all of a seasonal nature.

"With this type of employment structure, it is not surprising that almost half of the households have some members who are unemployed."

Source: The North Pacific Rim 1981:1-2

Commercial Fishing and Processing

Prince William Sound Communities

In 1985, people with Cordova addresses held 609 commercial fishing permits. These included 417 for salmon, 114 for herring roe-on-kelp, 57 for herring, and 21 for crab. Cordova residents held almost half (49.5 percent) of all limited entry salmon permits for the Prince William Sound Management

Area, including 36.7 percent of the set gillnet permits, 52.3 percent of the draft gillnet permits, and 45.4 percent of the seine permits. However, according to key respondents, these figures inflate the percentage of Prince William Sound salmon permits held by Cordova residents in that an unspecified number of permit holders reside outside Cordova for more than half the year, but maintain a Cordova address and Alaska residency to avoid higher permit fees for nonresidents (Stratton 1989:44-45).

Case V-22. The Contrasting Economic Picture for Alaska Natives in Valdez, 1979

"Valdez stands in stark contrast to the other villages and towns surveyed in the Chugach region, particularly with regard to income and employment. For example, only a small proportion of Native households, less than 5%, have an annual income of less than $10,000. Moreover, two-thirds of the households have some members who are employed full-time, which is distinctly different from the rest of the villages in the region. Perhaps the only blemish on this rather urban pattern is the 38.2% rate for household with unemployment. However, this unemployment is also different, for it is not tied to seasonal work, which is rather low – only 19% of the households – in Valdez."

Source: The North Pacific Rim 1981:52.

Nevertheless, the significance of commercial fishing in Cordova in 1980s cannot be overstated. As noted by Stratton (1989:39),

> Much of Cordova's employment, and the cash economy in Cordova, is integrally enmeshed in the commercial fishing industry. Many small businesses serve support functions for commercial fishermen. Consequently, employment is largely seasonal in nature, concentrating around the spring and summer herring and salmon fisheries.

Data from systematic household surveys conducted by the Division pertaining to 1985 and 1988 underscore this conclusion (Table V-7). In both study years, over half of Cordova's households had members who were directly employed in commercial fishing, as were 40.7 percent of all employed individuals in 1985 and 35.2 percent in 1988. Commercial fishing supplied 29.6 percent of all jobs in the community in 1985, and 17.6 percent in 1988. In 1988, 55.2 percent of all cash income in Cordova derived directly from commercial fishing. In addition to commercial harvesting itself, processing of commercial catches held an important place in Cordova's local economy in the 1980s.

According to Stratton (1990:20), "monetary employment for Tatitlek residents was largely seasonal and dominated by commercial fishing" in 1987 and 1988. As shown in Table V-8, the majority of Tatitlek's households were involved in commercial fishing in the late 1980s (73.7 percent in 1987/88 and 66.7 percent in 1988/89). Fishing generated most of the community's cash income during that period (59.1 percent in 1987/88 and 64.1 percent in 1988/89). In early 1989, Tatitlek residents held seven limited entry permits: five salmon gillnet and two salmon purse seine permits. Also, three village residents participated in other commercial fisheries, such as halibut and crab. Thirteen people worked as crew on commercial fishing vessels (Stratton 1990:24). Commercial fishing supplied about a third of the jobs in Tatitlek in the late 1980s (Table V-8).

Table V-7. Involvement in Commercial Fishing, Cordova 1985 and 1988

Percentage of:	1985	1988
Households	50.8%	54.6%
Income	NA	55.2%
Individuals	40.7%	35.2%
Jobs	29.6%	27.6%

Source: ADF&G 2001

Table V-8. Involvement in Commercial Fishing, Tatitlek, Late 1980s

Percentage of:	1987/88	1988/89
Households	73.7%	66.7%
Income	59.1%	64.1%
Individuals	46.2%	38.6%
Jobs	34.0%	32.1%

Source: ADF&G 2001

At Chenega Bay, the other predominantly Alaska Native community of Prince William Sound, a trend towards less involvement in commercial fishing had developed by the mid 1980s.

> Three village residents held three commercial fishery limited entry permits: one salmon seine permit and two salmon drift-gillnet permits. Two additional gillnet permits had been sold between the 1985 and 1986 salmon seasons. All of the permits were for Area E (Prince William Sound and Copper River). An additional two people indicated that they were employed as crew members on commercial boats, down from 14 in 1985. The loss of permits, combined with construction work available in the village, contributed to this change (Stratton and Chisum 1986:58).

This contrasted with the pattern that existed in Chenega prior to the 1964 tsunami (Stratton and Chisum 1986:15), when commercial fishing was as important as in Tatitlek.

> Commercial fishing was the mainstay of the cash sector of Chenega's economy in the 1960s. All 14 households represented by the historic survey respondents reported involvement in the salmon seine fishery . . . Two canneries on Evans Island provided employment or at least one

> member of half the household during the summer, typically women. . . Commercial salmon fishing with set and gill nets, and commercial harvesting of razor clams were other sources of employment.
>
> According to the respondents, much of the cash economy operated on a credit basis. Groceries and fuel were charged at the cannery stores, and later subtracted from commercial salmon harvests. Cash was not often exchanged except when village residents traveled to Cordova to sell furs and pick up supplies.

Lower Cook Inlet Communities

In 1980, Port Graham residents held 39 commercial fishing permits, including 21 limited entry salmon permits. In the same year, residents of Nanwalek held 11 commercial fishing permits, including 8 limited entry permits for salmon (Stanek 1985:89). Regarding the role of commercial fishing in the local economy of Port Graham and Nanwalek in the early 1980s, Stanek (1985:88) noted that,

> Local commercial fishermen employed people mostly as crewmembers of salmon seine and draft boats or at set net sites. A few residents also participated in the commercial halibut fishery or as crew members in commercial crabbing. Several people worked during the winter months as crewmembers on large crab boats in the Bering Sea or Kodiak area.

However, Stanek (1985:88) also observed that,

> While the commercial fishing industry, excluding cannery operations, was a primary source of cash income, it too provided little income per household. Although commercial fishing generated approximately $373,600 gross ex-vessel value in 1982 for both communities, this was only $7,472 per permit, or $4,612 per household.

Further details on commercial fishing and the local economy of Port Graham and Nanwalek were obtained in a systematic household survey conducted by the Division pertaining to 1987 (Table V-9). About half the households in both communities (54.8 percent in Nanwalek, 48.1 percent in Port Graham) had members employed in commercial fisheries in 1987. About a quarter of all employed individuals in each community worked as commercial fishers. In each village, commercial fishing provided just over 20 percent of all jobs held by residents. However, commercial fishing provided more income and a larger percentage of the total income in Port Graham (52.5 percent of all income) than in Nanwalek (19.2 percent).

Regarding other jobs in the two Lower Cook Inlet villages in the early 1980s, Stanek (1985:88,90) noted that,

> Cash employment opportunities have expanded in the two communities in recent years. More local wage jobs are available and more local control is exerted over these opportunities. . . Although there is a variety of work, most jobs are low paying or short-term and seasonal. . . Generally employment opportunities in both communities were doled out by the village council. Jobs were divided among workers from several households in order to give more than one household the chance to earn some cash to pay small bills, buy heating fuel, make small boat repairs, and buy small equipment items for hunting and fishing (Stanek 1985:88,90).

Table V-9. Involvement in Commercial Fishing, Nanwalek and Port Graham, 1987

Percentage of:	Nanwalek	Port Graham
Households	54.8%	48.1%
Income	19.2%	52.5%
Individuals	26.5%	26.7%
Jobs	21.1%	21.8%

Source: ADF&G 2001

Case V-23 is a further illustration of how short-term jobs provided small amounts of cash for Nanwalek and Port Graham residents in the early 1980s.

Case V-23. Short Term Jobs in Port Graham and Nanwalek, early 1980s

"During the study period, a variety of short-term community improvement projects employed local residents. In the spring and summer of 1982, a HUD housing project employed approximately eight Port Graham people as laborers and journeymen craftsmen to build 20 new homes. Initially, all workers for the project came from outside Alaska. A few of them left their positions and jobs opened for local hire in the spring of 1982. Concurrently, this same project in English Bay [now Nanwalek] employed four to six local people from time to time as laborers.

"Installation of water, sewer, electrical, and telephone service lines provided an additional number of short-term laborer jobs, as did funding for cleanup and landscaping around new facilities. The construction of school extensions and the upgrading of insulation and weatherization of older homes provided employment for two to six people as laborers throughout the summer of 1984.

Source: Stanek 1985:90

Kodiak Island Borough Communities

Division of Subsistence household surveys did not collect systematic employment data for Kodiak Borough communities prior to 1989. Davis (1986) provides Information about commercial fishing in the six Borough villages for 1984 and 1985 (Table V-10). With the exception of Old Harbor, Davis detected a trend of diminishing involvement by Alaska Natives in the commercial salmon fishery. At Akhiok, competition with boats "from the northern part of the island" was blamed for low catches and income (Davis 1986:171). At Larsen Bay, residents were selling their limited entry permits. For purse seining, the problem appeared to be a lack of financial means or business acumen to acquire larger, more modern boats. One former purse seiner said, “You have to be a lawyer to own a boat “ (Davis 1986:154-155). Davis (1986:154) observed that:

> There was a definite feeling among the villagers that “Natives are being squeezed out of fishing.” The cost of boats, loans, insurance, and occasionally personal complications such as divorce proceedings make it difficult for local fisherman to continue in the profession. They find it almost impossible to remain economically viable. Under the many constraints and expenses of continuing to fish, the local, regular jobs appear more attractive. In talking with permit owners in Larsen Bay, as in four other Kodiak villages, it seemed that in their view the heyday of salmon and crab fishing is over.

Table V-10. Limited Entry Salmon Permits Held by Residents of Kodiak Island Borough Villages, 1984/1985

	Total households	Total permit holders	Purse Seine	Beach Seine	Set Net
Akhiok	24	4	2	0	2
Karluk[1]	23	3	1	2	
Larsen Bay	46	6	6		
Old Harbor	93	29			
Ouzinkie	68	12			
Port Lions	77	19	19		

[1] Three purse seine permits had recently been sold; their former owners left Karluk. The remaining permit, owned by a 70-year old man with no boat "had not been fished for some time" (Davis 1986:130).

Source: Davis 1986

Chignik Area

Rates of involvement in commercial fishing were particularly high among households in the five Chignik Area communities during the 1980s. As shown in Table V-11, 82.1 percent of the households in the five communities combined had members employed in commercial fisheries in 1984, including 80 percent or more of all households in each community but Ivanof Bay (66.7 percent). Participation in commercial salmon fishing predominated, with 79.6 of all households involved. In 1984, there was much less involvement among Chignik Area households in other commercial fisheries, such as herring (19.4 percent involved), halibut (14.0 percent), and crab (5.9 percent). Commercial fishing provided about half or more of all the jobs in the five communities, and virtually every household with employment had at least one member with a commercial fishing job (Table V-12).

Table V-11. Chignik Area Participation in Commercial Fisheries, 1984

Fishery	Percentage of Households Participating[1]					
	Chignik Bay	Chignik Lagoon	Chignik Lake	Ivanof Bay	Perryville	ALL FIVE COMMUNITIES
Salmon	84.2%	82.4%	82.6%	50.0%	80.0%	79.6%
Crab	15.8%	11.8%	0.0%	0.0%	0.0%	5.9%
Herring	15.8%	41.2%	17.4%	0.0%	15.0%	19.4%
Halibut	0.0%	29.4%	0.0%	33.3%	25.0%	14.0%
Any Fishery	84.2%	88.2%	82.6%	66.7%	80.0%	82.1%

1 n = 28 households in Chignik Bay, 22 in Chignik Lagoon, 31 in Chignik Lake, 10 in Ivanof Bay, and 27 in Perryville. Total = 118 households.

Source: Morris 1987:59

Table V-12. Involvement in Commercial Fishing, Chignik Area Communities, 1984

Percentage of:	Chignik	Chignik Lagoon	Chignik Lake	Ivanof Bay	Perryville
Employed Households	88.9%	93.8%	90.5%	80.0%	94.1%
Income[1]					
Employed Individuals	56.4%	70.8%	76.9%	66.7%	72.7%
Jobs	47.8%	53.1%	60.6%	44.4%	58.5%

1 Data on income not collected for these communities for 1984.

Source: ADF&G 2001

Regarding other jobs in the Chignik Area, Schroeder et al. (1987:402) note:

> Other than commercial fishing activities, there are few economic opportunities for residents of the Chignik subregion. Each village has a limited number of jobs associated with village council work, health care, support for the local school through the Lake and Peninsula School District, the U.S. Postal Service, and the state-maintained roads and runways. In Chignik, Perryville, and Ivanof Bay there are small, locally owned and operated stores that usually provide one or two individuals limited employment. Occasionally, seasonal jobs based on special projects, such as school construction, become available. Seasonal employment is intermeshed with commercial fishing activities and subsistence enterprises to provide for the families of the subregion.

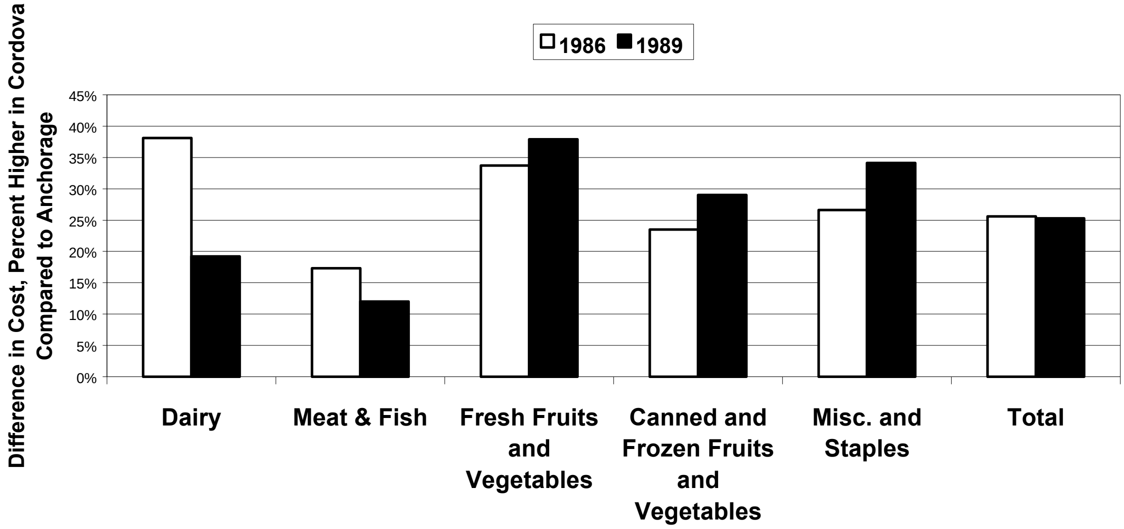
Cost of Food

In addition to seasonal employment, a narrow range of available jobs, and relatively low cash income, another feature of the local economy of the villages and towns of the Pacific Gulf region in the 1980s was a high cost of food in comparison with Alaska cities and towns on the road system. As described in Case V-24, the cost of groceries in Cordova was about 25 percent higher than Anchorage. Although cost of food data are not available for the villages, it is clear from general descriptions that expenses were even higher than in Cordova due to transportation costs and poor distribution systems. In the 1980s, several villages (e.g., as Chenega Bay and Tatitlek) did not have stores (Stratton 1990:30).

Case V-24. The Cost of Groceries in Cordova

"To put Cordova expenditures in perspective, researchers conducted a 104-item market basket survey in mid-February 1989 in both full-service grocery stories in Cordova and in an Anchorage grocery store. As had been true in the February 1986 Market Basket Survey, the two Cordova stores had totals on the survey that were close, 3.1 percent or $8.47 apart, on a tally of over $250. For comparison, the two Cordova grocery stores' prices were averaged. . . Cordova food prices overall were 25 percent higher than Anchorage, very similar to the market basket survey with an almost identical list in 1986. The one major difference between the two years was in dairy prices. The smaller differences recorded in 1989 are attributable to a State of Alaska price subsidy of dairy products in 1989 that lowered fresh dairy prices from earlier levels. Aside from dairy items, fresh fruits and vegetables displayed the largest differential in both years, 37.9 percent in 1989, and 33.7 percent in 1986."

Figure V-17. Cost of Groceries in Cordova Compared to Anchorage



Source: Stratton 1992:19.

SOCIAL AND POLITICAL ORGANIZATION

Kinship and Division of Labor

All descriptions of social organization in the Alaska Native villages of the study area for the 1970s and 1980s stress the role of kinship. Villages were essentially a set of interrelated extended families (e.g., Davis 1986; Stanek 1985, 2000; Mishler 2001:83-92). As discussed earlier in this chapter, subsistence hunting and fishing were organized around kinship relations, as was the sharing of subsistence harvests.

Regarding the organization of subsistence activities, there was a marked sexual division of labor in the communities of the study area, especially regarding hunting. Figure V-18 illustrates the percentage of the population in Alaska Native villages of the EVOS area, cities and towns of the EVOS area, and four Arctic communities (Kotzebue, Kivalina, Nuiqsuit, and Kaktovik) who hunted who were male.[1] In every community, hunting is primarily, but not exclusively, a male activity. A general rule is that about 80 percent or more of all hunters are male. This percentage did not vary much by year, type of community, or region, although a slightly higher percentage of hunters in Arctic communities (about 25 percent) were female. Figure V-19 compares villages by subregion for the last year in which a survey took place. There was little difference among oil spill region villages in the Prince William Sound and Lower Cook Inlet subregion on the one hand, and the Kodiak and Alaska Peninsula subregion on the other.

For subsistence fishing (Fig. V-20), in all the communities in all years, most fishers (about 60 to 65 percent) were men. In comparison with hunting, there were more women who subsistence fished. There was very little difference among subregions in the ratio of male/female subsistence fishers.

In most communities and subregions, plant gatherers were about evenly split between males and females, with the balance slightly in favor of males (Fig. V-21). This finding is perhaps surprising given the general association of berry gathering with women. However, the “plant gathering” activity included wood collection, which may account for the relatively high level of male involvement.

Marriage and Ethnicity

Data on marriage and ethnicity provide one measure of a source of culture change. In surveyed villages in the spill area (13 places), the percentage of exogamous marriages (marriages between Native and non-Native spouses) has increased over the past two generations (Fig. V-22). For "Alaska Native" marriages (where at least one spouse is Native), 25 percent were exogamous (between Native and non-Native spouses) for persons over 50 years of age, and 39 percent were exogamous for persons younger than 50 years of age. In predominately non-Native towns and cities (Cordova, Kodiak,

[1] Pre-spill data on individual participation in subsistence activities are rare. Therefore, this analysis includes information for 1991, 1992, and 1993. Given the similarities between the EVOS area villages and the arctic communities in this analysis, there is no reason to believe that the pattern in the early 1990s was markedly different from that prior to 1989.

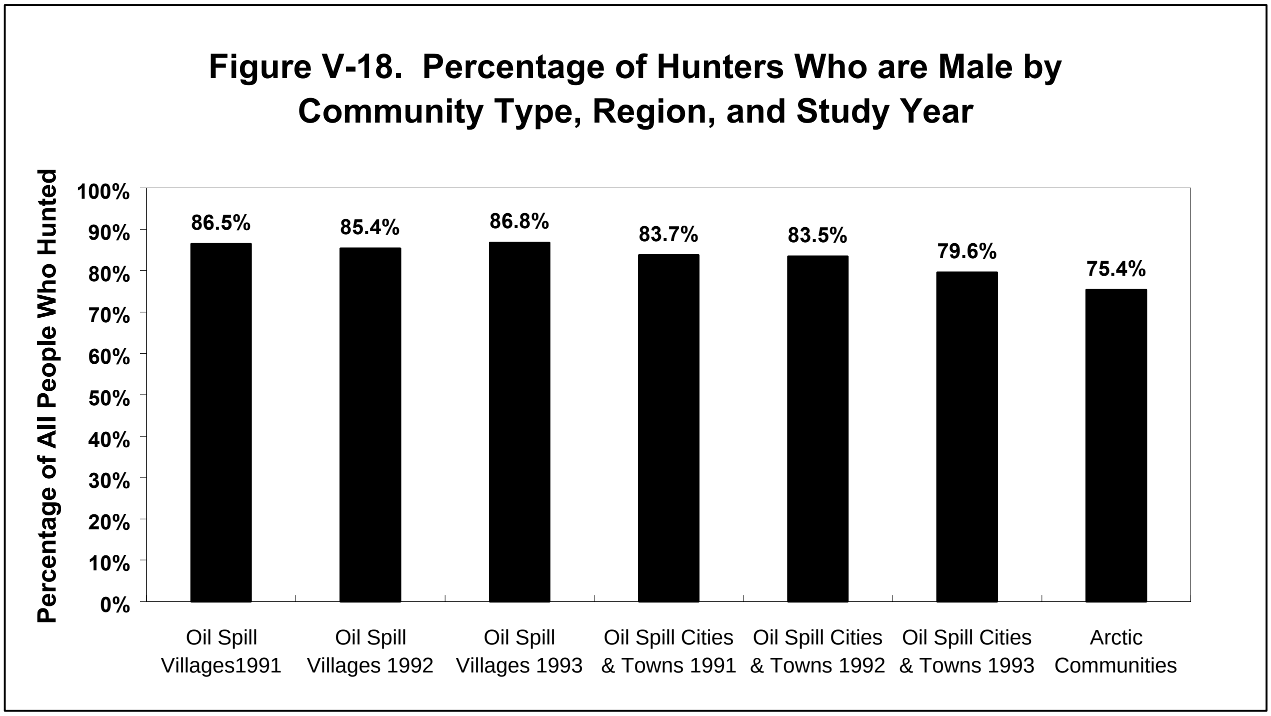


Figure V-18. Percentage of Hunters Who are Male by Community Type, Region, and Study Year
Percentage of All People Who Hunted
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
86.5%
85.4%
86.8%
83.7%
83.5%
79.6%
75.4%
Oil Spill Villages1991
Oil Spill Villages 1992
Oil Spill Villages 1993
Oil Spill Cities & Towns 1991
Oil Spill Cities & Towns 1992
Oil Spill Cities & Towns 1993
Arctic Communities

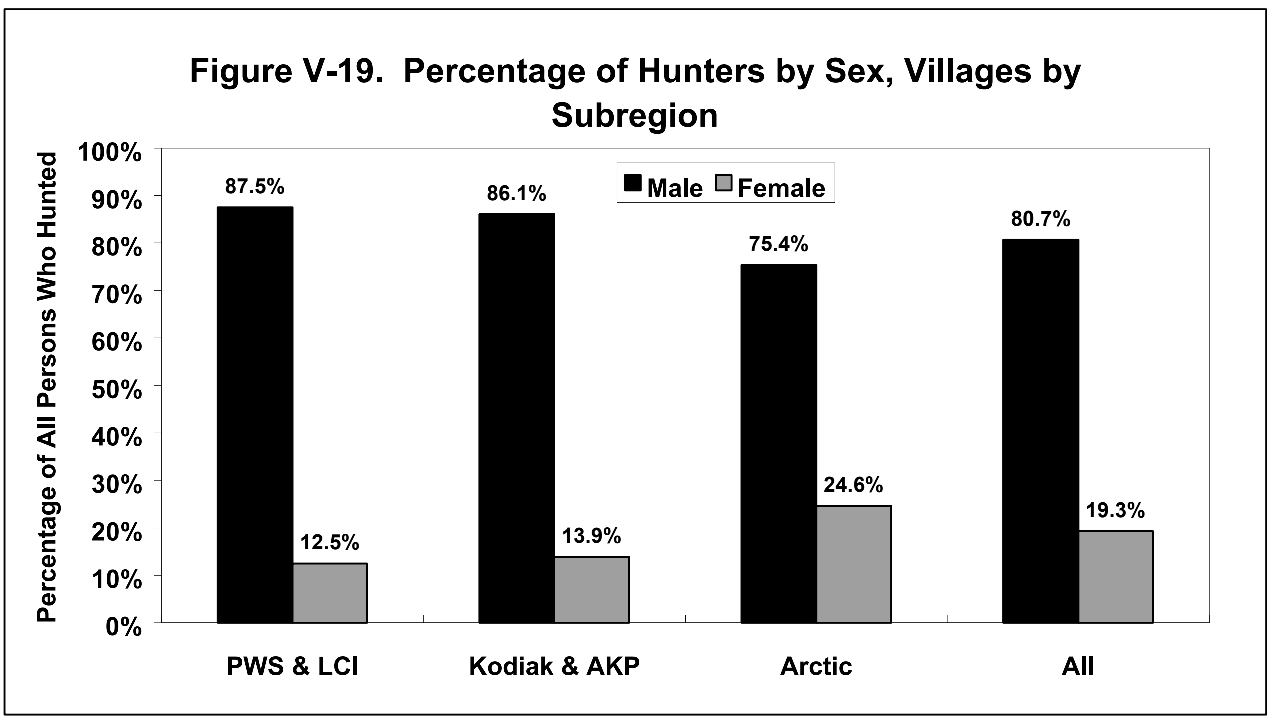


Figure V-19. Percentage of Hunters by Sex, Villages by Subregion
Percentage of All Persons Who Hunted
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Male
Female
87.5%
12.5%
86.1%
13.9%
75.4%
24.6%
80.7%
19.3%
PWS & LCI
Kodiak & AKP
Arctic
All

Figure V-20. Percentage of Fishers by Sex, Villages by Subregion

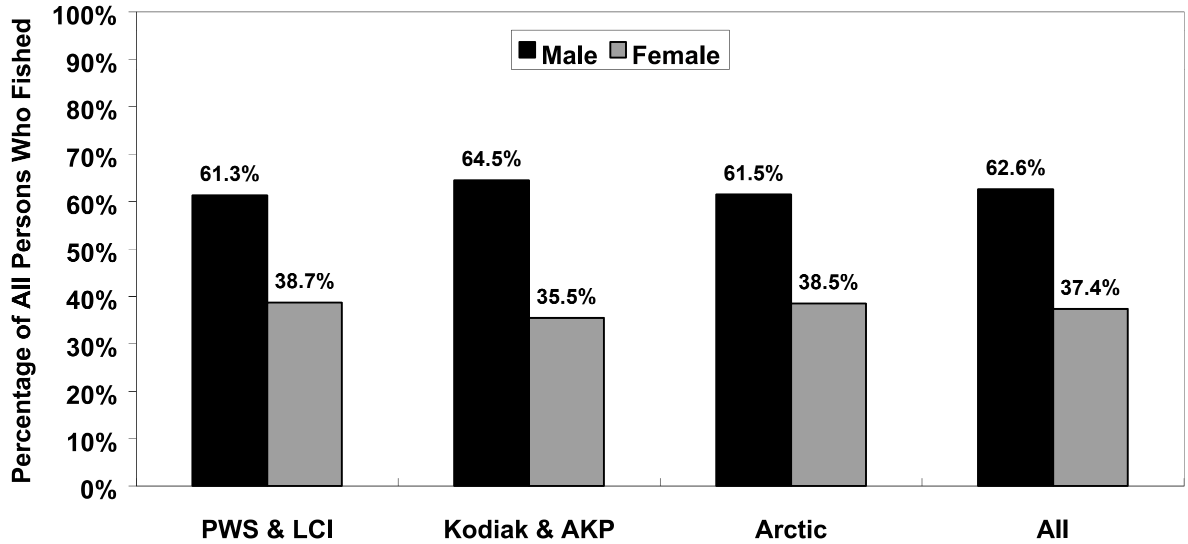
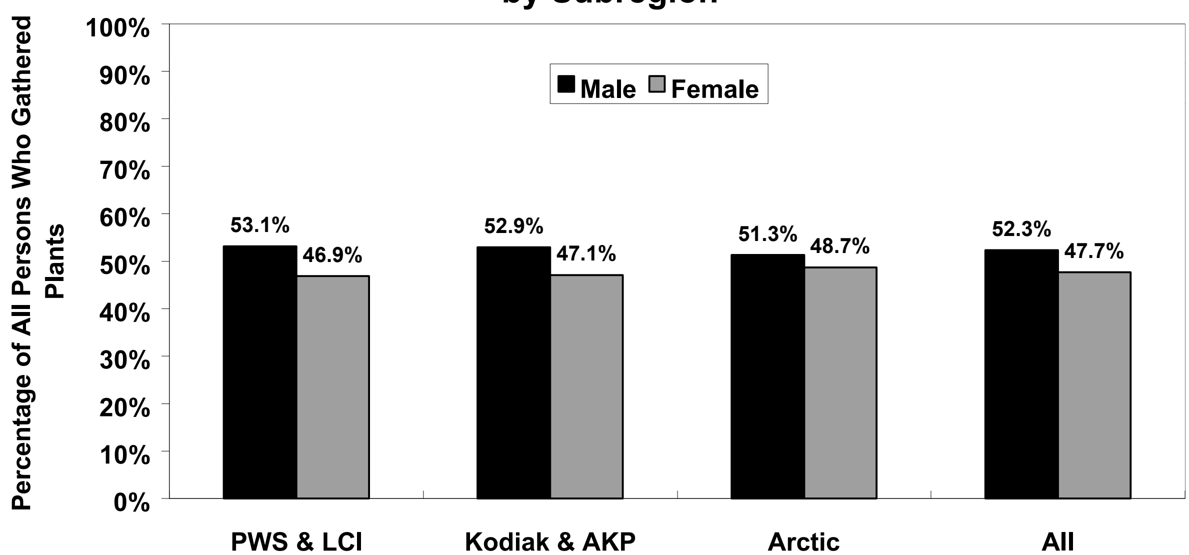


Figure V-21. Percentage of Plant Gatherers by Sex, Villages by Subregion



Kenai, Valdez), almost all marriages in surveyed Alaska Native households were exogamous (90 percent to 92 percent), and this is the case across both generations. The degree of exogamy was considerably less for communities in the arctic area (Kaktovik, Kivalina, Kotzebue, and Nuiqsut), where only 15 percent of all marriages were exogamous, compared with 35 percent in the spill area communities. In this set of communities, exogamous marriages have increased from 2 percent for persons over 50 years of age to 20 percent for persons less than 50 years of age.

The aggregate summaries mask variation between communities, as depicted in Figure V-23. For spill area villages, the percentage of exogamous marriages for persons less than 50 years of age ranged from a low of 9 percent at Chignik Lake to a high of 73 percent at Chignik Bay, two neighboring communities. In the arctic grouping, the percentage of exogamous marriages for people under 50 years of age ranged from a low of 7 percent in Kivalina (a "village") to a high of 33 percent in Kotzebue (a regional center or "town").

Political Organization, Regional Groups, and Organizations

In the 1980s, the communities of the Pacific Gulf area were politically dispersed. (See Case V-25.) For most of the 1980s, there were two boroughs: the Kenai Peninsula Borough (including Seward, Nanwalek, Port Graham, and Seldovia, among others), incorporated in 1964; and the Kodiak Island Borough (Kodiak, Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions), incorporated in 1963. The Lake and Peninsula Borough, including the Alaska Peninsula villages of Chignik, Chignik Lagoon, Chignik Lake, Ivanof Bay, and Perryville, among others), was incorporated in 1989. The communities of Prince William Sound were outside organized boroughs.

Of the 21 communities, 12 had formed municipal governments and incorporated under state rules. These were Cordova (incorporated in 1909), Valdez (1901), Whittier (1969), Seward (1912), Seldovia (1945), Kodiak (1940), Akhiok (1972), Larsen Bay (1974), Old Harbor (1966), Ouzinkie (1967), Port Lions (1966), and Chignik (1983). The remaining nine communities (Tatitlek, Chenega Bay, Nanwalek, Port Graham, Karluk, Chignik Lagoon, Chignik Lake, Ivanof Bay, and Perryville) were organized only under tribal governments. As illustrated in Case V-26, the addition of municipal governments created some new opportunities, but perhaps at the expense of former, more autonomous institutions.

A list of federally acknowledged tribes published by the Bureau of Indian Affairs in 1993 and periodically updated includes 20 tribal governments in the communities of the EVOS area (Table V-13). Additionally, there were non-profit organizations in Valdez (Valdez Native Tribe, formerly the Valdez Native Association) and Seward (Qutekcak Native Tribe; formerly the Mt. Marathon Native Association) that had not been formally recognized as tribes by the federal government.

The Native communities were divided into four for-profit regional corporations as organized under ANCSA. These were: Chugach Alaska Inc. (Prince William Sound, Nanwalek, Port Graham), Cook Inlet

Figure V-22. Exogamy by Generation and Place: of Native Marriages, Percent between Native and Non-Native Spouses

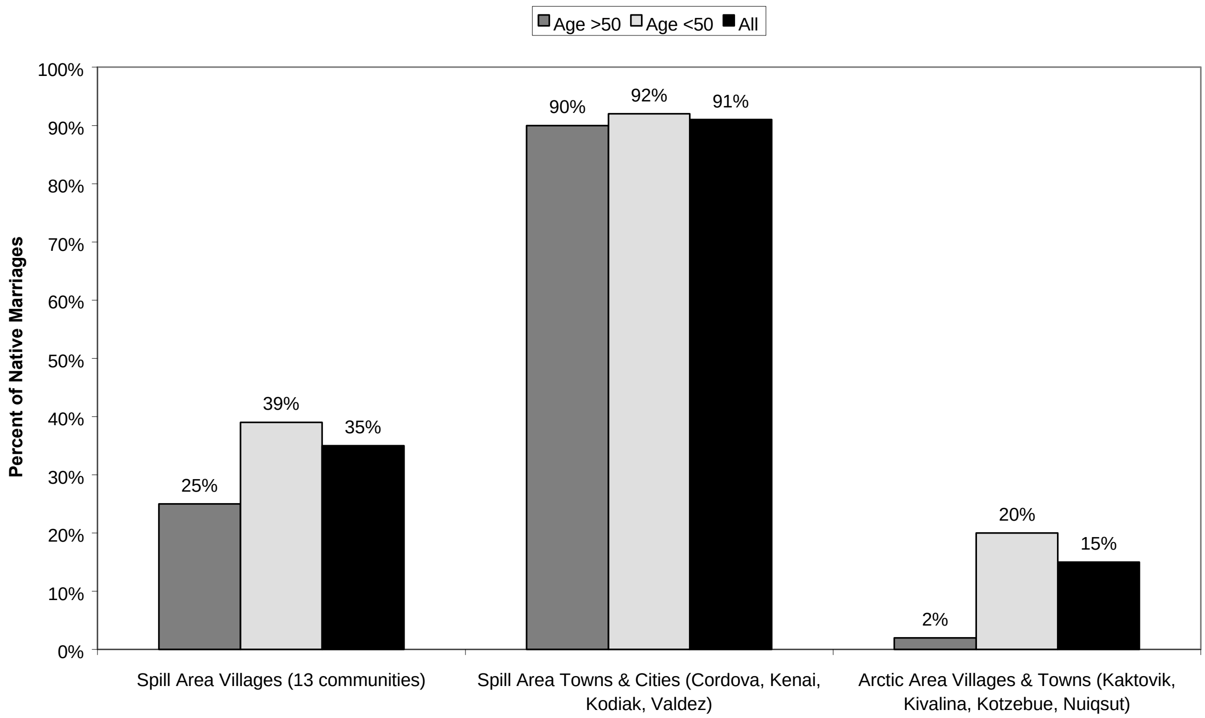


Figure V-23. Exogamy by Generation and Community (of Native Marriages, Percent between Native and Non-Natives)

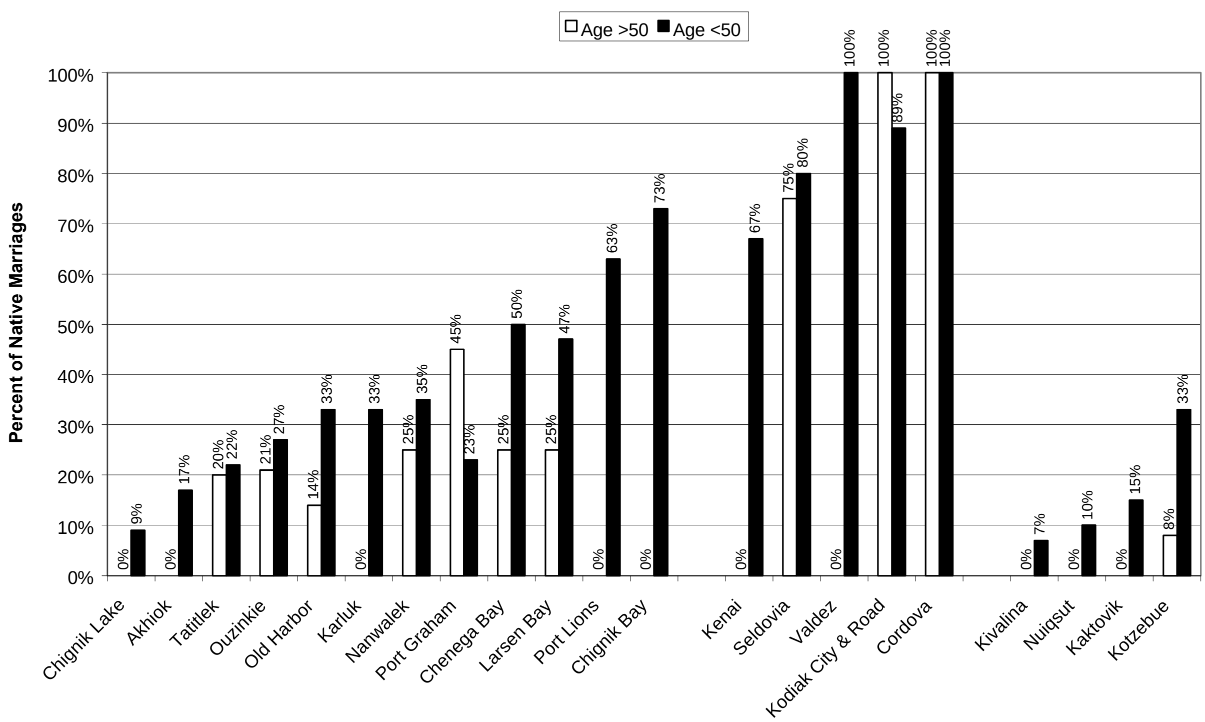


Table V-13. Political Institutions in Communities of the EVOS Study Area

Community	Municipal Incorporation	Borough[1]	Tribal Government[2]
~~Current Villages:~~			
Akhiok	1972	Kodiak Island Borough	Native Village of Akhiok
Chenega Bay	No	None	Native Village of Chenega
Chignik	1983	Lake & Peninsula	Native Village of Chignik
Chignik Lagoon	No	Lake & Peninsula	Native Village of Chignik Lagoon
Chignik Lake	No	Lake & Peninsula	Chignik Lake Village
Ivanof Bay	No	Lake & Peninsula	Ivanof Bay Village
Karluk	No	Kodiak Island Borough	Native Village of Karluk
Larsen Bay	1974	Kodiak Island Borough	Native Village of Larsen Bay
Nanwalek	No	Kenai Peninsula Borough	Native Village of Nanwalek
Old Harbor	1966	Kodiak Island Borough	Village of Old Harbor
Ouzinkie	1967	Kodiak Island Borough	Native Village of Ouzinkie
Perryville	No	Lake & Peninsula	Native Village of Perryville
Port Graham	No	Kenai Peninsula Borough	Native Village of Port Graham
Port Lions	1966	Kodiak Island Borough	Native Village of Port Lions
Tatitlek	No	None	Native Village of Tatitlek
~~Former Villages:~~[3]			
Afognak	No	Kodiak Island Borough	Village of Afognak
Kaguyak	No	Kodiak Island Borough	Kaguyak Village
Kanatak	No	Lake & Peninsula	Native Village of Kanatak
~~Towns and Cities:~~			
Cordova	1909	None	Native Village of Eyak
Kodiak City	1940	Kodiak Island Borough	Lesnoi Village (aka Woody Island)
			Shoonaq' Tribe of Kodiak
Seldovia	1945	Kenai Peninsula Borough	Seldovia Village Tribe
Seward	1912	Kenai Peninsula Borough	Qutekcak Native Tribe[4]
Valdez	1901	None	Valdez Native Tribe[4]
Whittier	1969	None	None

[1] Years of Borough incorporation: Kenai, 1964; Kodiak, 1963; Lake & Peninsula 1989.
[2] Name listed under tribal government might not be the name of the council.
[3] Former villages with tribal organizations. Afognak relocated at Port Lions, Kaguyak at Akhiok and Old Harbor; Kanatak at Pilot Point and other communities.
[4] Presently not recognized as a tribe by the Bureau of Indian Affairs.

Source: RurALCAP 2000; Alaska Department of Labor 1998; BIA 2001

Table V-14. Alaska Native Village Corporations, Regional Corporations, and Not-for-Profit Regional Organizations

Name of Organization	Location of Headquarters	Primary Village(s)	Regional Affiliate
Village Corporations:[1]			
Afognak Native Corporation	Kodiak	Port Lions	Koniag
Akhiok-Kaguyak Inc.	Anchorage	Akhiok, Old Harbor	Koniag
Anton Larsen, Inc.	Kodiak	Kodiak	Koniag
Ayakulik, Incorporated	Akhiok	Akhiok	Koniag
Bay View Incorporated	Anchorage	Ivanof Bay	BBNC
Bells Flats Natives, Incoporated	Soldotna	Kodiak	Koniag
Chenega Corporation	Anchorage	Chenega Bay	Chugach
Chignik Lagoon Native Corporation	Kodiak	Chignik Lagoon	BBNC
Chignik River Limited	Chignik Lake	Chignik Lake	BBNC
English Bay Corporation	Homer	Nanwalek	Chugach
Eyak Corporation	Cordova	Cordova	Chugach
Far West, Inc.	Kodiak	Chignik	BBNC
Lesnoi, Inc.	Anchorage	Kodiak	Koniag
Litnik, Inc.	Kodiak	Kodiak	Koniag
Natives of Kodiak, Inc.	Kodiak	Kodiak	Koniag
Oceanside Corporation	Anchorage	Perryville	BBNC
Old Harbor Native Corporation	Old Harbor	Old Harbor	Koniag
Ouzinkie Native Corporation	Ouzinkie	Ouzinkie	Koniag
Port Graham Corporation	Port Graham	Port Graham	Chugach
Tatitlek Corporation	Cordova	Tatitlek	Chugach
Uganik Natives		Kodiak	Koniag
Uyak, Inc.	Kodiak	Kodiak	Koniag
Regional Corporations:			
Bristol Bay Native Corporation (BBNC)	Anchorage		
Cook Inlet Region, Incorporated	Anchorage		
Chugach Alaska Corporation	Anchorage		
Koniag, Incorporated	Kodiak		
Not-for-Profit Regional Organizations:			
Bristol Bay Native Association	Dillingham		
Chugach Regional Resources Commission	Anchorage		
Chugachmiut	Anchorage		
Kodiak Area Native Association	Kodiak		

[1] Village corporations for Karluk and Larsen Bay merged with Koniag, the regional corporation.

Source: RurALCAP 2000, Koniag 2001

Region Inc. (Seldovia), Koniag Inc., and Bristol Bay Native Corporation (Alaska Peninsula). They were also serviced by four Native non-profit regional organizations: The North Pacific Rim for the Chugach Region (renamed Chugachmiut in 1992); the Cook Inlet Tribal Council for Seldovia; the Kodiak Area Native Association; and the Bristol Bay Native Association.

There were 15 village corporations organized under ANCSA (Table V-13, Table V-14). Several former village corporations in the Kodiak area merged with the regional corporation.

Case V-25. A Plethora of Political Organizations in Akhiok

"Politically, Akhiok surely must be the most complex small village in the study area. In the 1970s, there were three village corporations. Two of these, Akhiok and Kaguyak, merged in 1979. Later this entity joined with Koniag, Inc., but since has de-merged and today is once again a combined, separate corporation. The third corporation is for Ayakulik, one of the nine appealed Koniag villages; it has remained throughout a distinct corporate entity. In addition to these village corporations, Akhiok has both a city and a tribal council."

Source: Davis 1986:166.

Fish and Wildlife Management

The structure of fish and wildlife management in the spill region was at least as complicated as political organization. The spill region was divided into four commercial fisheries management areas by ADF&G, two in the southcentral region headquartered in Anchorage (Prince William Sound and Lower Cook Inlet) and two in the Westward Region headquartered in Kodiak (Kodiak and Chignik). Management of subsistence fisheries was the responsibility of biologists within the Commercial Fisheries Division stationed in Cordova, Homer, Anchorage, Kodiak, and Chignik (seasonally). There were four game management units, each with its own area manager within ADF&G: GMU 6 (Prince William Sound; Cordova); GMU 15 (Kenai Peninsula; Kenai and Homer); GMU 8 (Kodiak Island Archipelago; Kodiak); and GMU 9 (Alaska Peninsula; King Salmon).

Under the federal subsistence management program (developed since 1990), the area was served by three regional subsistence advisory councils (Southcentral, Kodiak-Aleutians, and Bristol Bay). Federal land management units included a national forest (Chugach National Forest); five national wildlife refuges (Kenai Peninsula, Kodiak, Alaska Peninsula, Becharof, and Alaska Maritime); and three national parks (Kenai Fiords, Katmai, and Aniakchak). Harbor seals and sea lions were managed by the federal National Marine Fisheries Service. Sea otter management was the responsibility of the US Fish and Wildlife Service.

Case V-26. Changing Political Institutions in Old Harbor

"In former times, before the Great Alaska earthquake of 1964, but after Russian Contact, traditional village government in the Old Harbor area revolved around the chief, or *Toyuk*, and his council: the Sukashiq, his assistant or second chief(s); the church lay reader; the Staristaq or church warden; and the village elders. According to those I interviewed, this system was successful because of the emphasis placed upon an existing cooperative network within the village, which encouraged information sharing among the people, thus allowing for a greater involvement with actual village operation.

"Information was conveyed through a series of meetings in which the entire community was expected to participate. Old Harbor continued with this form of government until 1964, when they elected a mayor and began operating with both a Tribal and City Council. However, it is important to note that the "Tribal Council," established by the tribal constitution to assure federal recognition of the Native Village of Old Harbor by the US Secretary of the Interior, differs in composition from the "traditional council" that, more informally, advised the Toyuq in the early days. That "traditional council" consisted of the Sukashiq, the Church Lay Reader, the Staristaq, and the Elders. By contrast, the new Council comprises seven members of the village, elected to terms of specific length by all the tribal members."

Mulcahy *in* Mishler 2001:69

"After the Great Alaskan Earthquake of 1964, traditional and church-focused government like that just described for Old Harbor gave way to new institutions which were induced by forces outside of the villages, namely state and federal agencies. In both Old Harbor and Ouzinkie, tribal governments continued, but at some point chiefs were replaced with tribal councils.

"The shift from chiefs to council presidents may have been fairly cosmetic, but at the same time there were also some deeper structural changes which fragmented political power and weakened the tribal councils. This fragmentation occurred when tribal councils were supplanted by state-chartered local governments with mayors and city councils. . . The advantages to city governments were that they qualified communities to receive state funds for public works and capital improvements. . .

"Following the passage of the Alaska Native Claims Settlement Act in 1971, yet another layer of leadership and power was added in the form of village profit-making corporations.

"With most of the political power concentrated in the corporations and the cities, some residents have sarcastically said that the major function of tribal councils is the operation of bingo games."

Mishler 2001:77-78

In the 1980s, several communities within the spill area had some successes in using state and federal subsistence statutes to improve subsistence hunting and fishing opportunities. For example, in 1980, working through the Alaska Board of Fisheries, Nanwalek and Port Graham achieved major changes to subsistence salmon fishing seasons in their traditional areas, and seasonal limits on subsistence catches were eliminated. In 1987, Tatitlek and Chenega Bay obtained similar changes in Prince William Sound. The Alaska Board of Game recognized subsistence uses of mountain goats by the Prince William Sound and Lower Cook Inlet villages, and modified seasons and permitting requirements accordingly. On the other hand, many features of the fish and wildlife management system remained problematic for the villages. Some examples included individual bag and possession limits for some species of wildlife and for halibut, prohibitions against rod and reel subsistence fishing, and a prohibition against taking bird eggs and migratory waterfowl during traditional harvest seasons in the late winter and spring.

EXPRESSIVE CULTURE

Religion

In every village, a Russian Orthodox Church with a distinctive onion-shaped dome was a prominent feature of the physical profile. The Russian Orthodox faith structured an annual cycle of holidays and observances, including Christmas, New Year, Easter, and name days (see Mishler 2001, Simeone and Miraglia 2000, and Stanek 2000 for descriptions of these celebrations). In a few communities (Tatitlek, for example), evangelical Protestant denominations had made some converts, but overall, Russian Orthodoxy remained identified as the “traditional” or “Native” church. Contemporary customs and holiday celebrations associated with Russian Orthodoxy in the villages are a syncretism of Christian and Alaska Native traditions (e.g., Stanek 2000:80 – 84).

Music, Dance, and Oral Traditions

In the 1980s, no Alaska Native dance groups were active in any of the study area’s communities. Regarding Nanwalek and Port Graham, Stanek (2000:86) noted that elders recalled that as children, they observed traditional Alutiiq dances that mimicked seals, gulls, and other animals. However, from the 1940s through the 1980s these dances were not performed in public due to ridicule from outsiders. Villagers occasionally performed the dances outside the villages while inebriated, resulting in further embarrassment being associated with them.

Nevertheless, a strong musical tradition developed and prospered in many of the villages, linked to new instruments such as guitars, accordions, and fiddles. Mishler (2001:113-116) provides a number of examples (see also Stanek 2000:87). A rock and roll group known as "The English Bay Band" was quite popular in Nanwalek and developed a positive regional reputation in the 1970s and 1980s.

Efforts were underway in the 1980s to collect and preserve rapidly disappearing oral traditions, especially those told in the Alutiiq language. A primary example is the series of "Fireweed" and "Alexandrovsk" books developed by students at Nanwalek and Port Graham (Port Graham School 1981, 1982, 1983; English Bay School 1980, 1981; see also Johnson 1984). Other examples include the "*Ukulaha*" series in Ouzinkie (Ouzinkie High School 1981, 1982) and the "*Elwani/Iluani*" series in Kodiak (Kodiak Aleutian Regional High School 1976-1982; sections reprinted in Vick 1983).

Case V-27. Popular Music in Ouzinkie, 1940s to 1960s

Martha Anderson [of Ouzinkie] says that during her youth: "dancing was a big thing. My brother Nick [Katelnikoff] Jr. was an accordion player, and we also had violins, mandolins, and guitars. Dances were generally held on Friday nights. Saturday nights were reserved for Russian Orthodox observances."

Dances were held all winter long and were very popular. Fred and Esther Chernikoff recalled five different dance halls: 1) Marzan's dance hall and liquor store, which flourished in the 1930s, 2) Arthur Levine's dance hall, which was the old school house, actively used in the 1940s, 3) Frank Hammerly's dance hall, also active in the 1940s at the same time as Arthur Levine's, 4) Ed Opheim's Pool Hall, which was used as a dance hall for two years during the late 1940s but relied on recorded jukebox music, and 5) Tim Panamarioff Sr.'s dance hall, later sold to Tommy Renshaw, which was active in the 1950s. According to Reed Oswalt, "Tim built this dance hall, and it was built on a swamp in the middle of the town, and our house where we stayed was about 150 yards from the dance hall, but when he'd have a dance, between the noise and everything, it would make the whole area bounce [laughs], so it had quite a bit of resilience to it. It served a pretty good purpose."

Source: Misher 2001:112

LANGUAGE

Use of Alaska Native Language

Retention of use of an Alaska Native language in a community may be one indicator of the strength of traditional culture and values. Language retention also reflects the history of communities in terms of economic development, demography, and the degree of influence of the western educational system. (For discussions of the history of Alaska Native languages, see Krauss 1980 and Miyoaka 1980.)

In North America, Native American languages in general are in serious decline, and have been for much of the 20th Century (and much earlier in some areas). Perhaps 400 or more languages were spoken in North America before contact with Europeans beginning around 1500. Presently, data are available on 309 Native North American languages, the remainder having become extinct before adequate documentation took place. Of these 309 languages, as classified by Goddard (1996:3), 120 (38.8 percent) had become extinct as of 1995, and an additional 72 (23.3 percent) were spoken "by only a few of the oldest people." Only 46 languages (14.9 percent) were still spoken "by a significant number of children," with only two of Alaska's 20 Native languages (Central Yup'ik and Siberian Yup'ik) falling in this category. The final category, languages spoken by adults but by no or very few children, contained 91 languages (29.4 percent of North American Native languages), including Alutiiq ("Pacific Yup'ik").

Status of Alaska Native Languages According to U.S. Census Data

The U.S. Census includes a question about languages spoken in the home. It reports language use as "English only" or names other languages used. (The latter categories do not imply exclusive use of a language other than English.) It should be noted that the census measures "use" and not knowledge of a language other than English. A large decline in the percentage of the population using a language may not necessarily reflect a similar level of decline in knowledge of that language. For example, children with knowledge of a language may continue to use it while their parents are alive, but discontinue that usage when the older generation passes away. Nevertheless, the census data provide a useful index for comparison between communities and over time.

Figure V-24 illustrates the percentage of the state's population speaking an Alaska Native language at home in 1990. Data are depicted by the 12 Alaska Native regions as defined by ANCSA. For the entire Alaska population, 5.4 percent spoke an Alaska Native language. For the Alaska Native population itself, 36.0 percent spoke an indigenous language. The highest percentage of Alaska Native language speakers resided in northern and western Alaska. In only two regions, Calista and Arctic Slope, did a majority of the Alaska Native population speak a Native language at home, although 40 percent or more did so in three other regions (NANA, Bering Straits, and Bristol Bay). In the two Native regions

Figure V-24. Percentage of Population Speaking an Alaska Native Language at Home, by Native Corporation Region, 1990

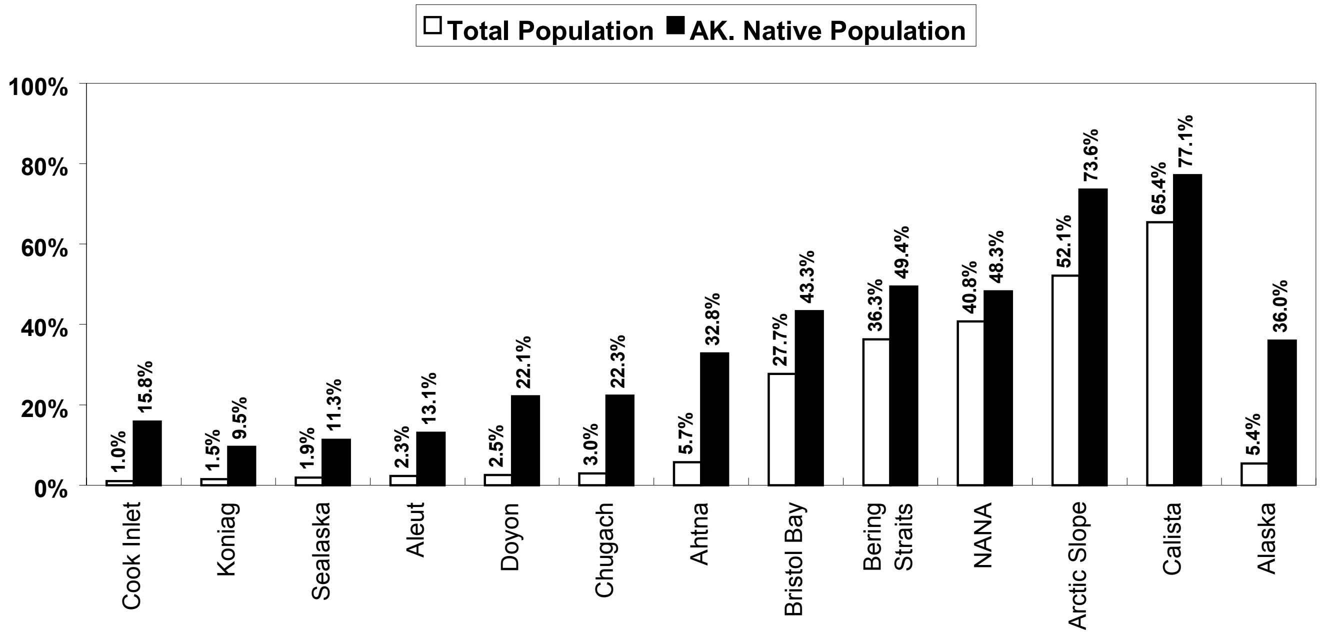
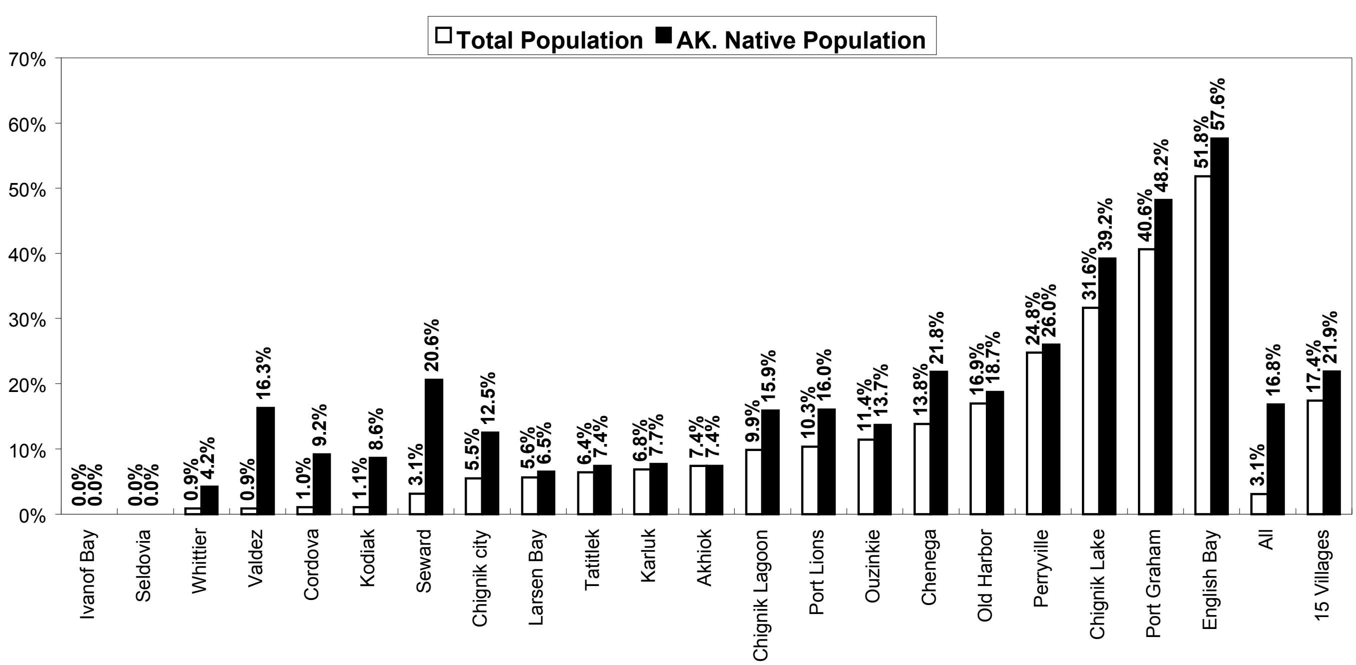


Figure V-25. Percentage of Population Speaking an Alaska Native Language at Home, Communities of the EVOS Area, 1990



encompassing most of the EVOS area, Chugach and Koniag, the percentage of the Native population using a Native language at home was 22.3 percent and 9.5 percent, respectively, both below the state-wide percentage.

Table V-15 and Figure V-24 provide more detail on Native language use in the communities of the EVOS area. Although only 3.1 percent of the total population of the area spoke a Native language at home in 1990, 16.8 percent of the overall Alaska Native population and 21.9 percent of the Alaska Native population of the 15 predominantly Alaska Native communities did so. Focusing on the Alaska Native population, only in Nanwalek, did a majority (57.6 percent) speak an Native language at home. In 1990, a Native language was spoken in the home by a quarter or more of the Native population in three other communities: Port Graham (48.2 percent), Chignik Lake (39.2 percent), and Perryville (26.0 percent). It should be noted that the relatively high percentage of home use of Native languages among the Native population of Seward (20.6 percent) and Valdez (16.3 percent) likely reflects emigration of Native language speakers from other parts of the state rather than use of the indigenous Alutiiq language.

Figure V-20 compares US census data in 1980 and 1990 for the 15 predominately Alaska Native communities in the EVOS area. In most communities, there was a decline in Alaska Native language use over the decade. For the 15 communities combined, there was a decline from 31.7 percent of the Native population using an Alaska Native language in 1980 to 21.9 percent in 1990. Over half the Native population of Ivanof Bay, Nanwalek, Perryville, Port Graham, and Tatitlek used an Alaska Native language at home in 1980, but by 1990, this was true only at Nanwalek. [The disappearance of the use of Alutiiq at Ivanof Bay between 1980 and 1990 is likely because the two elders who are the parents of many of the adults in this small village moved to Anchorage.]

Alaska Native Language Center Assessments

In order to assess the current status and potential future of Alaska Native languages, the Alaska Native Language Center (ANLC) classified communities in three categories regarding knowledge of Native languages by children: 1) all or most of children are learning the language; 2) some children are learning the language; and 3) few or no children are learning the language. The assessments are generally consistent with the US Census data. Areas with the most people using Alaska Native languages in the home, such as the Calista Region, contain the most communities in the first or second category of language knowledge by children.

In 1974, the ANLC placed all but two of the Alutiiq communities in the third category (few or no children learning the language). Port Graham was in the second category (some children learning the language) and Nanwalek was in the first (most children learning the language). Correspondingly, Krauss (1980:44) wrote of the situation in the 1970s:

Table V-15. Percentage of Population Five Years of Age or Older
Using an Alaska Native Language at Home

Community	1980 Data[1] Percent Speaking Alaska Native Language at Home	1990 Data Total Alaska Native Population	Language Spoken at Home: English-only	Language Spoken at Home: Alaska Native Language	Percent Speaking Alaska Native Language
Akhiok	5.3%	68	63	5	7.4%
Chenega	NA	55	43	12	21.8%
Chignik	3.6%	72	63	9	12.5%
Chignik Lagoon	NA	44	37	7	15.9%
Chignik Lake	16.3%	79	48	31	39.2%
Ivanof Bay	93.2%	26	26	0	0.0%
Karluk	16.7%	65	60	5	7.7%
Larsen Bay	35.0%	124	116	8	6.5%
Nanwalek	88.6%	125	53	72	57.6%
Old Harbor	19.8%	225	183	42	18.7%
Ouzinkie	5.0%	153	132	21	13.7%
Perryville	67.4%	96	71	25	26.0%
Port Graham	69.1%	112	58	54	48.2%
Port Lions	18.4%	119	100	19	16.0%
Tatitlek	52.5%	81	75	6	7.4%
Subtotal	31.7%	1,444	1,128	316	21.9%
Cordova city		217	197	20	9.2%
Kodiak city		708	647	61	8.6%
Seldovia city		37	37	0	0.0%
Seward city		379	301	78	20.6%
Valdez city		203	170	33	16.3%
Whittier city		48	46	2	4.2%
Subtotal		1,592	1,398	194	12.2%
Total		3,036	2,526	510	16.8%
Alaska		74,438	47,658	26,780	36.0%

[1] Source only distinguishes English, Spanish, and other; assume "other" = Alaska Native Language except Chignik Lagoon, where a non-English-speaking, non-Native family resides. It is not possible to determine Native language use in the larger communities using this source. The 1980 percentage is for the entire population of the community due to the limitations with the source. However, a very large majority in each community in 1980 was Alaska Native.

Sources: Bureau of the Census 1980, 1990

> Of 3,000 Alutiiqs, about 1,000 still speak the language. The youngest speakers of the Koniag dialects are in their twenties, but the Chugach dialect is spoken by some children in English Bay and to a lesser extent Port Graham. The youngest children of even these communities, however, are becoming dominant in English, so it is doubtful that the language will survive indefinitely.

When the ANLC revised these classifications in 1982, all the Alutiiq communities were in the third category (few or no children learning the language). Port Graham dropped one notch and Nanwalek two (Krauss 1974, 1982). This implies an abrupt shift in language use at Nanwalek and a very uncertain future for the survival of Alutiiq as a living language.

Assessment of Knowledge of Alutiiq in Four Villages

In 1995, Hallamaa (1997) assessed the status of knowledge of the Alutiiq language in Nanwalek, Port Graham, Chenega Bay, and Tatitlek. The assessment was based on a census of each community in which knowledgeable individuals assessed each person's ability to speak or understand the language. He also drew on an earlier study in Nanwalek done by Sammallahit in 1980. Table V-16 summarizes Hallamaa's data on the number of speakers of Alutiiq in each community. His findings are generally consistent with those of the Alaska Native Language Center and US Census data. In none of the four communities were any children fluent speakers of the language. The greatest number of speakers as well as the youngest speakers resided in Nanwalek and Port Graham.

Table V-16. Number and Percentage of Speakers of Alutiiq

		Nanwalek 1980	Nanwalek 1995	Port Graham 1995	Chenega Bay 1995	Tatitlek 1995
Fluent Speakers	Number	51	35	47	6	5
	Percent	50.0%	23.6%	31.8%	10.3%	5.8%
	Youngest	14	29	32	55	67
Other Speakers	Number	6	7	10	3	6
	Percent	5.9%	4.7%	6.8%	5.2%	7.0%
	Youngest	12	18	24	53	50
Total Speakers	Number	57	42	57	9	11
	Percent	55.9%	28.4%	38.5%	15.5%	12.8%
	Youngest	12	18	24	53	50

Note: modified from source to include Alaska Native population only
Source: Hallamaa 1997

Hallamaa (1997:211-215) also discusses factors that have led to the decline in the use and knowledge of the Alutiiq language throughout its range. These include the arrival of large numbers of English speakers (usually for economic reasons), employment by Native people in the cash economy, formal education which repressed Native language use, boarding schools, mass media, and the creation of corporations under ANCSA, the operation of which emphasize proficiency in English. In Nanwalek, the last "stronghold" of Alutiiq, a major blow was the sending of children to boarding schools in the late 1950s and 1960s. There, as had happened in earlier education contexts for other villages, these children were ridiculed for speaking Alutiiq. When they returned home and raised children of their own, they spoke to them in English only so the children would not suffer the humiliation that their parents had. A key respondent quoted in Hallamaa (1997:212) explained:

> There are many reasons why the kids don't speak *Sugtestun* in our community anymore. From my own and other people's personal experiences the reasons are simple. Many times we were made fun of for speaking our language or just being Native. This happened when we were trying to fit in different communities, like when we were going to high school or maybe even on a shopping trip. Most of that time we were young and defenseless, and when that happened we had to swallow a lot of anger and hurt. Many times I was embarrassed about being a Native or I really didn't want to be a Native. Then we grew up to be adults and most of us got married and had kids. We didn't want to hurt our children like we had been hurt and made fun of or punished when we spoke our native language.

According to the same key respondent in Nanwalek (Hallamaa 1997:216), reasons for the decline in the use of Alutiiq and for the difficulties for improving its status include:

> 1. No matter how much we teach the Sugtestun language, we are still being bombarded with English, via school, TV and radio.
> 2. We have no immersion [programs] either at the school or in the village.
> 3. We don't have a large number of Sugtestun speakers left in the village to propagate the language.
> 4. The village does not acknowledge the Sugtestun language being lost as a problem because of too many other problems and diversions, like alcohol and drugs and trying to run local government and Native corporations.
> 5. We have lukewarm support and lip service from the school districts. Our language is more of a filler/elective type of class.

Hallamaa (1997:216-217) suggests that the only solution to the revitalization and long-term survival of the language is a "total immersion program." [1]

[1] In June 2000, the Nanwalek Council submitted a grant proposal to the Alaska Department of Community and Regional Affairs $24,000 from the EVOS Criminal Settlement (see Chapter Six) to begin a "Sugtestun language immersion program". Funding was approved in August 2000.

Ethnographic Data Division of Subsistence Research

In doing household surveys, the Division of Subsistence needed Alaska Native language translators in Port Graham and Old Harbor, where elders lived who preferred to be interviewed in Alutiiq. In the Division's experience, in only Nanwalek and Port Graham in the 1990s were there more than a handful of households where Alutiiq was spoken on a regular basis in the home.

Although fluency and use of Alutiiq is low and in continuing decline, words from the Alutiiq language survive in common use in many of the study communities in at least two important domains. The first is kinship, where the terms *upa* ("grandfather") and *uma* ("grandmother") are used. The use of these terms may be reinforced by their similarity to those used by speakers Central Yup'ik, with whom Alutiiq people interact in Anchorage and some of whom have married into Alutiiq communities. Another relationship that is denoted by an Alutiiq term is the "namesake" – *alukuq*. The child chosen to receive the name is perceived to resemble the other older person.

Even more important is the retention of Alutiiq words in the realm of subsistence uses. Examples were provided in the section above on "Cultural Knowledge and Values," above. Knowledge of Alutiiq place names was important in connection with subsistence activities in a few communities, most importantly Nanwalek and Port Graham (Stanek 1985:121-122).

Conclusions Regarding Native Language use in Alutiiq Villages

There were a number of factors working against survival of the Alutiiq language in the 1980s and 1990s. These included:

- relatively few speakers
- intermarriage with non-Alutiiq speakers
- mass media
- repression in educational system
- little to no current role in education
- no written tradition
- few or no contexts for its use (i.e., economic, religious, or political)
- low assessment of importance of preserving the language relative to other issues

It is likely that some minimum knowledge will persist as a marker of cultural identity, especially as long as people use traditional foods. It is also likely that some marginal knowledge will be maintained through bilingual programs and preservation of oral traditions in written form.

By the late 1980s, the almost inevitable loss of the Alutiiq language raised a number of questions. Would critical cultural information still be transmitted between the oldest and youngest generations? Was a key marker of Alutiiq identity being lost? Would the loss of the language place more importance on maintaining and expressing other markers of cultural and ethnic identity, such as subsistence practices, political institutions, crafts, expressive culture, and social networks? Finally, would the aftermath of the *Exxon Valdez* oil spill create or reinforce conditions that could undermine or discourage nascent efforts to preserve the use of Alutiiq?

In general, resource development and social disasters may very well create conditions similar to those that undermined use of Alutiiq in the first place, such as loss of local control over key institutions (economic, educational, political), loss of contexts for using the Native language, and development of economic and social incentives to become English dominant. However, if in the aftermath of a disaster, conditions develop that support revitalization movements, these could reinvigorate language use. In such case, timing is critical, in that the status of language knowledge when revitalization occurs will have a strong influence on the potential for success.

DISCUSSION: COMMUNITY TYPES IN THE PACIFIC GULF

In Chapter Two, we asserted the existence of three types of communities in the Pacific Gulf – "villages," "towns," and "cities." The distinction between "village" ("rural," "bush") and "city" ("urban") represented a fundamental social division in Alaskan society in the late 20th century. The distinction is essential for understanding spill responses by households and communities. Villages in the Pacific Gulf were affected by the spill in ways substantially different from cities. As shown earlier in Fig. II-1, there were 15 villages and two cities (Valdez and Kenai) in the Pacific Gulf that were surveyed as part of this study. In addition, there were three "towns" – Kodiak City, Cordova, and Seldovia – whose status as a community type distinct from "cities" was less certain. Building upon the characteristics of communities reviewed in the previous sections of this chapter, this section presents a more detailed analysis of the cluster of linked features that distinguished village, town, and city, which underlies the remainder of the analysis of this report. The section presents quantitative support for the socioeconomic, demographic, and cultural differences between community types. In subsequent chapters, the responses within the villages nearest to the spill are described in greater detail.

As shown in Table V-17, there was a cluster of demographic, cultural, and socioeconomic traits that clearly distinguished villages from cities (Valdez and Kenai) in the Gulf of Alaska, with towns (Kodiak City, Cordova, and Seldovia) falling intermediate between the two community types. Each trait is measured using data from the household surveys of this study for the years 1991-93.[1] The mean values are presented for villages in three geographic groups (Prince William Sound/Lower Cook Inlet, Kodiak Island, and the Alaska Peninsula), while the individual community values are presented for the three towns and two cities.

Demographic Features

The villages of the Gulf of Alaska were small (mean sizes between 126 and 176 people), compared with the towns (414 for Seldovia, 2,467 for Cordova; 12,492 for Kodiak City) and the cities (4,184 for Valdez, 23,289 for Kenai). As noted previously, villages have shown comparatively little population growth since the middle of the 20th century. Between 1950 and 1997, the four Prince William Sound communities grew by only 59 percent and Kodiak villages by only 57 percent, while the two Alaska Peninsula villages in Table V-17 decreased by 16 percent. By contrast, during this time period, the population at Valdez increased by 655 percent and at Kenai by 716 percent. Growth in two towns was intermediate – Cordova (112 percent) and Kodiak City (295 percent). Seldovia's population decreased by 5 percent. As discussed previously, the great population growth in cities and towns primarily has been fueled by in-migration by persons from outside Alaska. They also have grown in part from an out-flow of

[1] Data for 1991, 1992, and 1993 are used for this analysis because of limited quantitative data on harvests for home use for the towns and cities for the 1980s.

Table V-17. Community Groups by Demographic, Cultural, and Socioeconomic Characteristics, Gulf of Alaska, Circa 1991-93

	"Villages"			"Towns"			"Cities"	
	PWS-LCI Chenega Bay, Tatitlek, Port Graham, Nanwalek	***Kodiak Is.*** Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, Port Lions	***Alaska Peninsula*** Chignik Bay, Chignik Lake	Seldovia	Cordova	Kodiak City	Valdez	Kenai
Demographic Characteristics								
Community Size (Mean Population of Group)	138	176	126	414	2,467	12,492	4,184	23,289
Population Growth (Change 1950-97)	59%	57%	-16%	-5%	112%	295%	655%	716%
Cultural Characteristics								
HHs with Heads Born Outside Alaska	11%	13%	29%	54%	79%	75%	77%	89%
Alaska Natives in Population	88%	83%	72%	30%	15%	11%	8%	6%
Indigenous Foods Index (HHs Using Food Types)	66%	59%	56%	28%	26%	23%	10%	10%
Sport License Index (Licensed Residents)	10%	14%	10%	28%	41%	32%	41%	48%
Socioeconomic Characteristics								
~~Subsistence Sector~~								
Wild Food Production (Lbs Per Capita)	297	323	400	178	160	150	90	77
Core Foods (Wild Foods Used by Majority of HHs)	14	12	12	7	8	5	2	4
Wild Food Distribution Index (Percent of Food Types Received by HHs)	19%	15%	17%	9%	9%	8%	5%	4%
~~Wage-Market Sector~~								
Per Capita Monetary Income	$8,655	$9,948	$11,889	$15,205	$17,901	$21,354	$24,885	$18,283
Percent Adults with Year Round Employment	26%	21%	14%	41%	48%	52%	67%	63%
Months Employed of Working Adults	7.3	7.2	7.5	9.0	9.7	10.0	10.3	10.0
Per Capita Income from Commercial Fisheries	$674	$2,382	$4,470	$3,704	$4,066	$4,005	$418	$467

Source: ADF&G 2001 and Household Surveys, Division of Subsistence, ADF&G

persons from the villages to the towns and cities. The slower growth in the villages is a result of increase from natural births and modest levels of in-migration, tempered by an out-migration of villagers to the larger towns and cities. Demographic history lays the roots of many of the cultural and socioeconomic distinctions found between villages, towns, and cities described in the next sections.

Cultural Composition

The cultural composition of Pacific Gulf communities is directly linked to the birth origins of the population. In the villages, by far the largest majority of household heads were born in Alaska, principally within the region, and most from a heritage that included one or more Alaska Native parents. In the villages of Prince William Sound-Lower Cook Inlet and Kodiak Island, only between 11 to 13 percent of household heads surveyed during the 1991-93 were born outside of Alaska (see Table V-17). In these areas, between 83 to 88 percent of household heads identified themselves as Alaska Native. There was somewhat more in-migration of outsiders into the villages of the Alaska Peninsula. In Chignik Bay and Chignik Lake, 29 percent of household heads were born outside of Alaska villages and 72 percent of household heads self-identified as Alaska Natives. Overall, the populations of the villages in the Pacific Gulf region were primarily Alutiiq, with families strongly influenced by a mix of Alutiiq, Russian, and Euroamerican cultural traditions.

By contrast, the origin of most residents in the towns and cities in the Pacific Gulf was outside of Alaska. By a large majority, household heads were born outside of Alaska – Kodiak City (75 percent), Valdez (77 percent), Cordova (79 percent), and Kenai (89 percent). In the two cities, only a small segment of the population identified themselves as Alaska Natives – Kenai (6 percent) and Valdez (8 percent). In the towns of Kodiak and Cordova, Alaska Natives made up between 11 to 15 percent of the population, twice that of the cities, but still a small minority of the community. In Seldovia, about 54 percent of households were born outside of Alaska, and Alaska Natives comprised 30 percent of the population. Overall, the population of the towns and cities in the Pacific Gulf region was primarily non-Native. In consequence, the current cultural patterns in the towns and cities have been greatly shaped by the Euroamerican cultural traditions brought to the communities from outside the state.

Traditional Foodways

In the Pacific Gulf, villages differed from cities culturally. There were different sets of culturally based beliefs and values in villages compared with the cities, due to the different culture histories of their populations. Two belief systems are used here to illustrate cultural differences between villages and cities – foodways and orientation to the natural environment.

Food habits are rooted in cultural traditions. Which animals and plants are recognized as edible is learned within families as part of evolving cultural traditions within a community. Similarly, which food items are preferred and used as a matter of taste and health are bound up with the customary food uses of families and the larger community. People commonly prefer the foods that have been used as part of the cuisines of their immediate family and community. In the late 20th century, cities and villages differed substantially in what their residents recognized as edible and valued as food. As food procurement and use are primary aspects of the human experience, these cultural patterns find expression in the socioeconomic system of the community, as shown below.

In Table V-17, we have used survey information to demonstrate the culturally based differences in food preferences between village, town, and city in the Pacific Gulf. A variable was created called an Indigenous Food Index, defined as the mean percentage of households using six types of wild foods – chitons, gull eggs, harbor seals, octopus, clams, and deer or caribou (Table V-18). These were selected as examples of wild resources widely available to Gulf of Alaska communities (a more complete count of all types of wild foods is used as a Core Food Index in a later section). The recognition of some of these items as food differs among cultural traditions. Chitons, gull eggs, and harbor seals are recognized as food in Alutiiq cultural traditions, but not generally recognized as such in Euroamerican food traditions. While Euroamerican cuisines include octopus, clams, and wild game (deer or caribou), their use is low.

The percentages of households that used each of these six food items during the previous survey year are shown by community in Table V-18. The Indigenous Foods Index represents the mean of these six values. As shown in Figure V-26, Valdez and Kenai each scored lowest (a score of ten) on the Indigenous Foods Index. In these cities, chitons, gull eggs, octopus, and harbor seals were rarely used as food. Clams and deer were more commonly used, but still by a minority of households. Pacific Gulf villages were substantially higher than the cities on the Indigenous Foods Index. Greater than half of the households used the six traditional foods in the villages of Prince William Sound, Lower Cook Inlet, and Kodiak Island. Use was also high, though more variable, among villages of the Alaska Peninsula. There is an exceptionally strong statistical relationship between the cultural composition of a community (percentage of Alaska Natives) and the Indigenous Foods Index (Fig. V-27). The use of traditional wild foods is directly related to the presence of Alaska Natives in the community's population.

By this cultural measure, the towns of Kodiak City, Cordova, and Seldovia fall between the cities and the villages -- between 23 to 28 percent of households used the six indigenous food items. The three towns scored twice as high as the cities, but substantially below the villages. Two towns (Kodiak City and Cordova) fall above the regression line in Figure V-27, suggesting that a greater proportion of households use the six traditional foods than expected by the towns' cultural composition. This is because a substantial proportion of households use deer, clams, and octopus (foods used in both Euroamerican and Alutiiq cuisines). Chitons, gull eggs, and harbor seals were used by only a small portion of households in Kodiak City and Cordova. This indicates that families from Euroamerican traditions in Kodiak City and Cordova use certain wild foods more than their counterparts in the city, due to acculturative trends in the towns towards a village diet, although acculturation has not been sufficient to move chitons, gull eggs, and harbor seals onto many dinner plates in town.

Table V-18 Indigenous Foods Index:
Percent of Households Using Wild Food Types

	Chiton	Gull Eggs	Seal	Octopus	Clams	Deer or Caribou	Index (Mean)
Cities							
Valdez 1993	0	3	6	6	20	23	10
Whittier 1990	1	1	6	10	16	27	10
Kenai 1993	0	0	1	1	46	12	10
Towns							
Kodiak City 1993	4	3	1	22	37	70	23
Cordova 1993	0	2	9	15	62	66	26
Seldovia 1993	26	2	8	29	83	20	28
Villages (PWS-LCI)							
Chenega Bay 1993	48	0	57	61	65	83	52
Tatitlek 1993	25	55	95	65	60	95	66
Port Graham 1993	96	17	78	73	100	16	73
Nanwalek 1993	97	27	85	70	91	6	74
Villages (Kodiak Is)							
Port Lions 1993	31	13	18	29	91	80	44
Karluk 1991	62	0	39	62	69	100	55
Ouzinkie 1993	59	44	38	46	79	89	59
Larsen Bay 1993	53	15	33	80	88	90	60
Old Harbor 1991	57	33	60	48	88	93	63
Akhiok 1992	67	58	63	67	88	88	72
Villages (Alaska Peninsula)							
Chignik Lagoon 1989	27	0	7	20	67	73	32
Chignik Bay 1991	33	3	33	60	63	87	47
Sand Point 1992	58	27	18	72	25	51	42
Perryville 1989	93	63	63	52	59	67	66
Chignik Lake 1991	75	38	71	79	100	100	77
Ivanof Bay 1989	100	86	86	71	86	100	88

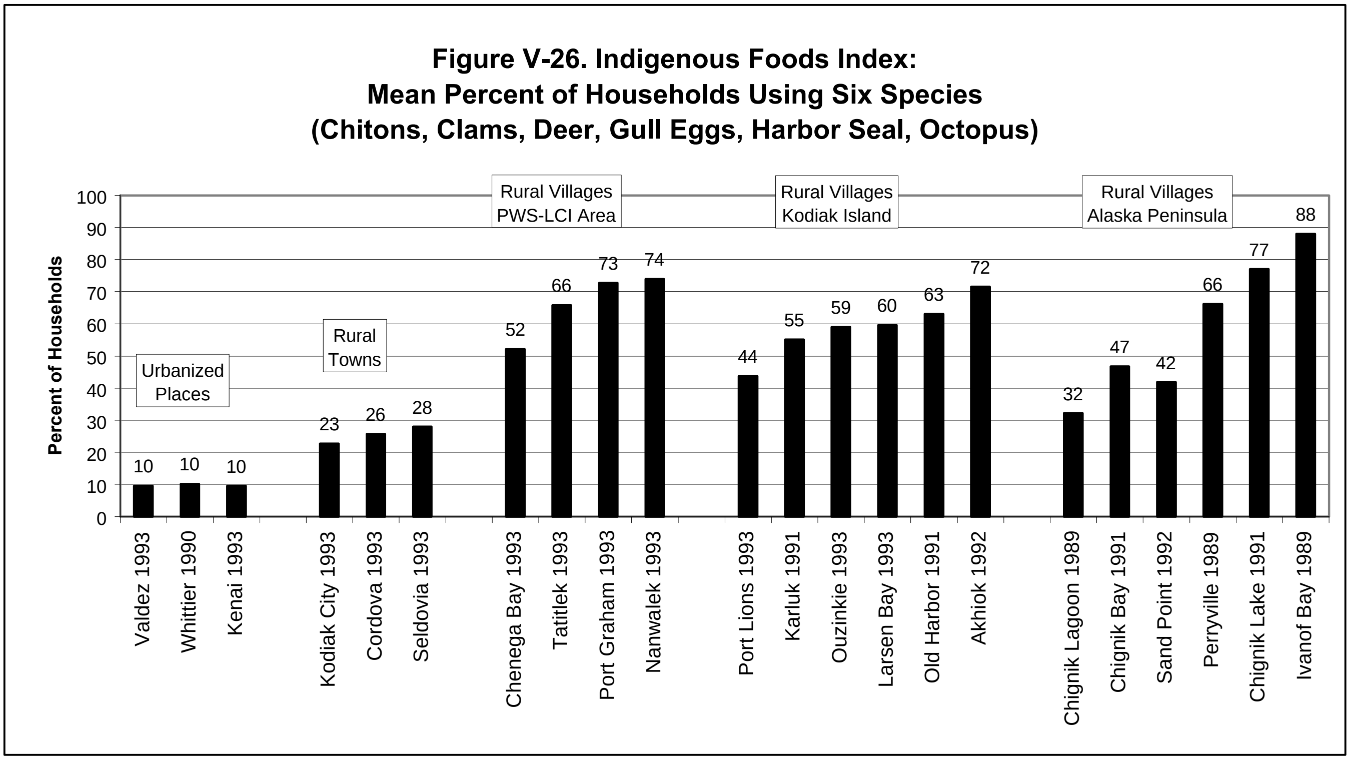


Figure V-26. Indigenous Foods Index:
Mean Percent of Households Using Six Species
(Chitons, Clams, Deer, Gull Eggs, Harbor Seal, Octopus)
Percent of Households
0
10
20
30
40
50
60
70
80
90
100
Urbanized Places
Rural Towns
Rural Villages PWS-LCI Area
Rural Villages Kodiak Island
Rural Villages Alaska Peninsula
10
10
10
23
26
28
52
66
73
74
44
55
59
60
63
72
32
47
42
66
77
88
Valdez 1993
Whittier 1990
Kenai 1993
Kodiak City 1993
Cordova 1993
Seldovia 1993
Chenega Bay 1993
Tatitlek 1993
Port Graham 1993
Nanwalek 1993
Port Lions 1993
Karluk 1991
Ouzinkie 1993
Larsen Bay 1993
Old Harbor 1991
Akhiok 1992
Chignik Lagoon 1989
Chignik Bay 1991
Sand Point 1992
Perryville 1989
Chignik Lake 1991
Ivanof Bay 1989

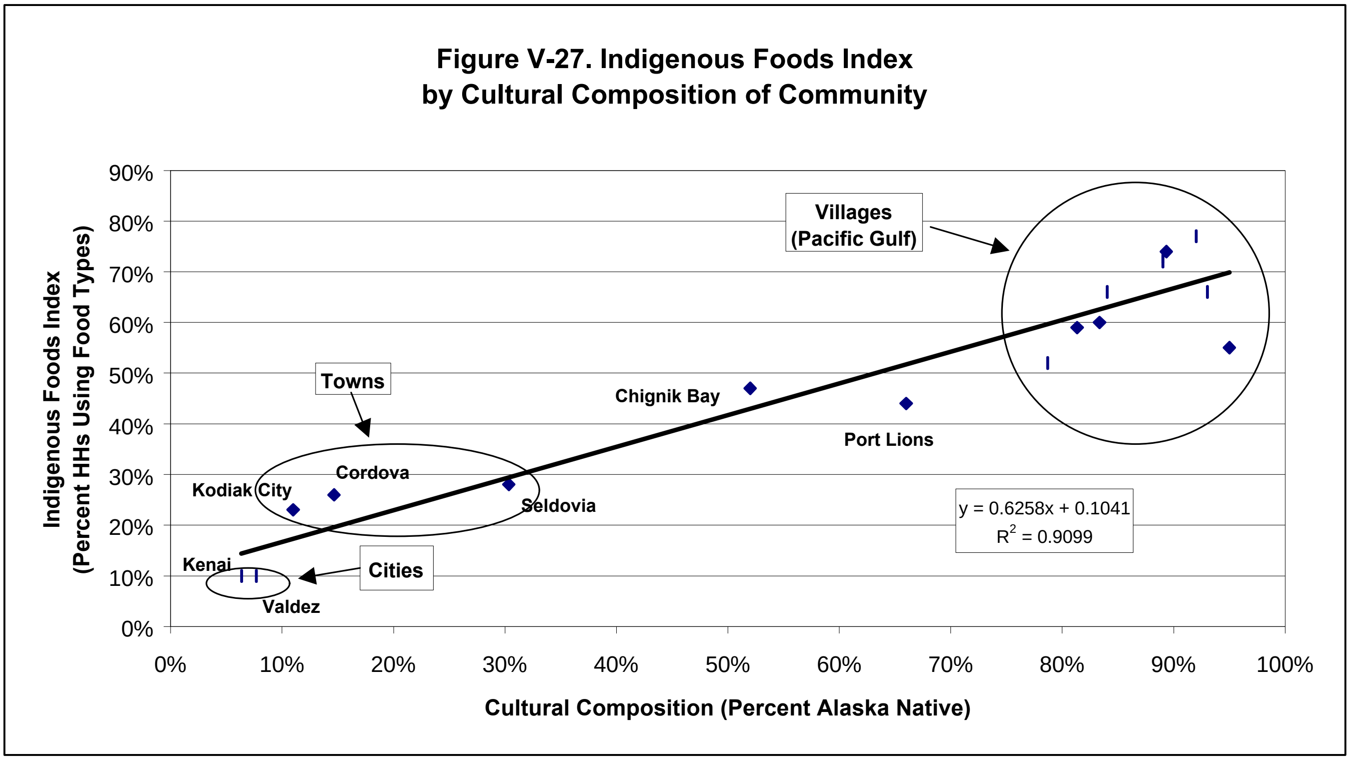


Figure V-27. Indigenous Foods Index
by Cultural Composition of Community
Indigenous Foods Index
(Percent HHs Using Food Types)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Villages
(Pacific Gulf)
Towns
Cities
Chignik Bay
Port Lions
Cordova
Kodiak City
Seldovia
Kenai
Valdez
y = 0.6258x + 0.1041
R^2 = 0.9099
Cultural Composition (Percent Alaska Native)

Federal and state regulations influence but do not determine traditional patterns of food use in the Pacific Gulf communities. Harvest rules for chitons, octopus, clams, deer, and caribou were equivalent for all classes of users, so they cannot be a reason for the differences in use of these food items. Under federal and state regulations, it was illegal to gather gull eggs for food at the time of this research. Despite this legal prohibition, gull eggs were gathered and distributed by families in the villages, showing that the cultural value of eating gull eggs in the villages was stronger than the perceived risks from violating regulations. In the towns and cities where there was a greater enforcement presence, regulatory prohibitions may have restricted some families from choosing to gather eggs. Under federal regulations, anyone may eat harbor seal, but only coastal Alaska Natives may hunt them. It is doubtful that this regulation played a significant role in restricting consumption of harbor seals in the towns and cities, as these products circulated and were available. Marine mammal products were not consumed primarily because Euroamerican tastes do not value them as food.

Human-Nature Relationships: The Outdoor Sport Tradition

Another example of the cultural divide between village and city in the Pacific Gulf was in regards to human-nature relationships. Like foodways, a person's perceived relationship with the natural world is rooted in the cultural traditions of families and communities. One basic cultural difference pertained to the prevalence of the "outdoor sport hunting and fishing tradition" within a community's population. The outdoor sport tradition of late 20th century America is a cultural complex of beliefs, values, and activities traceable to European cultural roots. Within this tradition, "sport" is a central value of hunting and fishing, with the harvest and use of wild foods additional (and often secondary) values. Hunting and fishing are primarily conducted by members of this tradition as valued breaks from a normal routine of work. Principles of "fair chase" are followed, which are commonly embedded in regulatory restrictions of equipment, seasons, and bag limits. Animals are referred to as "game," consistent with the sport ethic. In the Pacific Gulf, sport hunting and fishing were part of a growing recreational industry, employing retailers, outfitters, and guides. In state regulation, harvesting for sport values was one of four legally recognized uses of wild resources, alongside commercial (harvests for market sale), subsistence (harvests for "customary and traditional" uses as food, clothing, sharing, and noncommercial exchanges), and nonconsumptive uses (wildlife viewing).

Subsistence traditions of the Alutiiq differed in most respects from sport traditions. Within subsistence traditions, the primary value of harvesting was for food, not sport. Hunting and fishing were part of a normal routine of work, rather than breaks from employment. "Fair chase" did not guide harvest activities, but traditional principles of efficiency, economy of effort, and respect towards animals. Harvests were typically for sharing and exchange among segments of the community.

In Pacific Gulf cities, the cultural sport tradition was prevalent, while in villages, subsistence traditions prevailed. This is shown by the Sport License Index in Table V-17. The Sport License Index is the percentage of residents holding a State of Alaska sport-fishing license. State regulations required persons older than 16 years of age to obtain a sport fishing license if fishing with a rod and reel. The index is calculated by dividing the number of persons in a community with the number of sport licenses sold in a community (using 1995 license files as the index year). As such, the Sport License Index may be used as a general estimate of the extent to which the anglers in a community are fishing under sport values. As shown in Table V-17, Pacific Gulf cities and towns score about three to four times higher than villages on the Sport License Index. The largest proportion of residents with sport fishing licenses is found in Kenai City (48 percent), followed by Valdez (41 percent) and Cordova (41 percent). The town of Kodiak City is somewhat lower with 32 percent of residents holding a sport fishing license. By contrast, the Sport License Index is lowest in the villages. On average only from 10 percent to 14 percent of village residents obtained sport fishing licenses.

The use of sport fishing licenses reflects a cultural value orientation rather than the use of rod and reels, as shown in Figure V-28. There was no relationship between the prevalence of sport licenses and the prevalence of rod and reel fishing in a community. Based on household survey information, fishing with rod and reel was extremely common in all surveyed Pacific Gulf communities – Prince William Sound-Lower Cook Inlet villages (71 percent of households used rod and reel), Kodiak Island villages (60 percent), Alaska Peninsula villages (45 percent), Seldovia (72 percent), Cordova (69 percent), Kodiak City (66 percent), Kenai Area (74 percent), and Valdez (66 percent). Yet, unlike city and town residents, few anglers in Pacific Gulf villages obtained sport fishing licenses. This was the case even though there were license vendors in almost all the communities, and state regulations required persons fishing with a rod and reel to obtain a sport fishing license. Licenses were not being boycotted in Pacific Gulf villages. Rather, they were viewed as inappropriate. Because most villagers perceived their fishing with rod and reel as subsistence, it was believed unnecessary to obtain a sport fishing license. Sport fishing licenses and sport fishing regulations were viewed as applying to sport fishers, who lived elsewhere than the villages. This cultural view held sway even though contrary to state regulatory requirements. The prevalence of the two belief complexes (sport and subsistence) was strongly associated with the cultural composition of a community, as shown in Figure V-29. As the percentage of Alaska Natives in a community increased, the percentage with sport fishing licenses decreased.

<u>Subsistence Sector Characteristics</u>

The socioeconomic systems of villages and cities in the Pacific Gulf differed substantially, alongside the cultural differences described above. As stated in Chapter Two, the production and distribution of wild foods was a well-developed economic sector in villages, but comparatively weak in cities. This is shown by measures of wild food production and distribution in Table V-17. Wild food

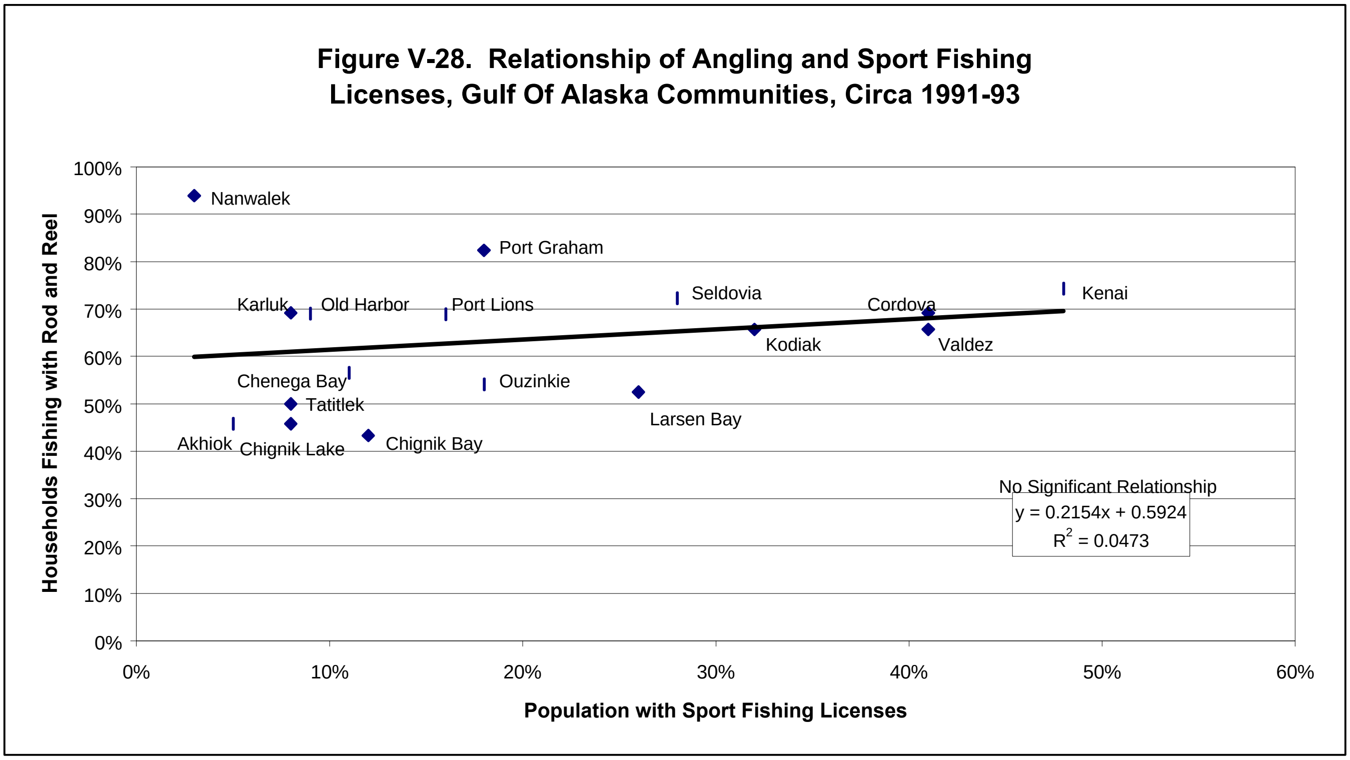


Figure V-28. Relationship of Angling and Sport Fishing
Licenses, Gulf Of Alaska Communities, Circa 1991-93
Households Fishing with Rod and Reel
Population with Sport Fishing Licenses
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0%
10%
20%
30%
40%
50%
60%
Nanwalek
Port Graham
Karluk
Old Harbor
Port Lions
Seldovia
Cordova
Kenai
Kodiak
Valdez
Chenega Bay
Ouzinkie
Tatitlek
Larsen Bay
Akhiok
Chignik Lake
Chignik Bay
No Significant Relationship
y = 0.2154x + 0.5924
R2 = 0.0473

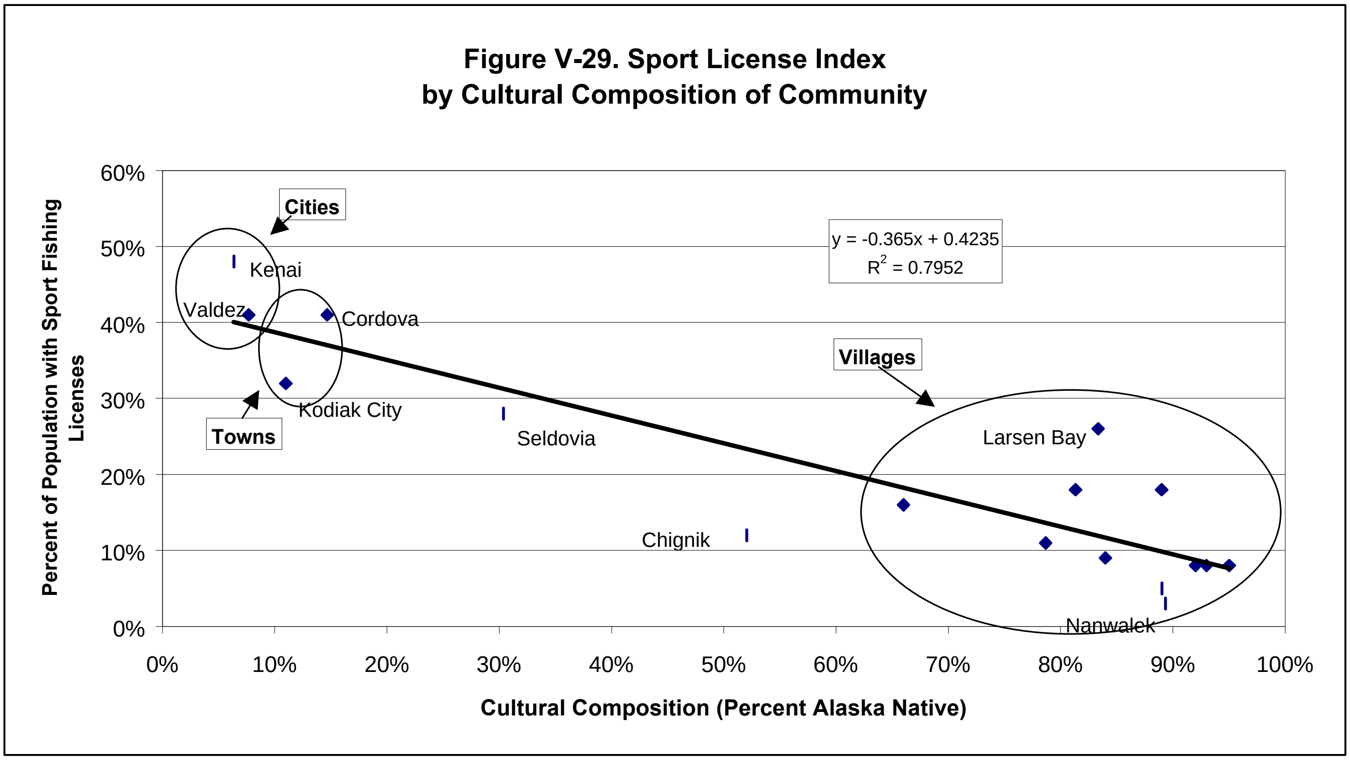


Figure V-29. Sport License Index
by Cultural Composition of Community
Percent of Population with Sport Fishing Licenses
Cultural Composition (Percent Alaska Native)
60%
50%
40%
30%
20%
10%
0%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Cities
Kenai
Valdez
Cordova
Kodiak City
Towns
Seldovia
y = -0.365x + 0.4235
R2 = 0.7952
Villages
Larsen Bay
Chignik
Nanwalek

harvests in villages (between about 297 pounds to 400 pounds per capita) were substantially greater than wild food harvests in the two cities (Kenai, 77 pounds, and Valdez, 90 pounds). Larger wild food harvests were associated with the subsistence values of Alaska Native cultures, while smaller volumes were associated with the predominant outdoors sport tradition in cities. The three towns fell intermediate between village and city (Kodiak City, 150 pounds; Cordova, 160 pounds; Seldovia, 178 pounds). Harvest levels were strongly related to the cultural composition of a community, as shown in Figure V-30 (see also Wolfe and Walker 1987).

Villages harvested a much greater diversity of species for food compared with cities, as shown by a Core Foods Index in Table V-17. This index provides a count of the number of wild foods used by the majority of households (>50 percent) in a community. As such, it measures a "community" trait displayed by the majority of households. The number of core foods in the cities was about a third the number in villages (Table V-19). The core village diet contained about 14 wild food types in Prince William Sound-Lower Cook Inlet villages, about 12 food types in Kodiak Island villages, and about 17 food types in Alaska Peninsula villages. By comparison, there were only two core foods in Valdez: only halibut and coho salmon were used by a majority of households. In Kenai there were only three core foods – halibut, coho, and sockeye (moose typically is not a core food – 36 percent used it in 1991 and 43 percent in 1992). Towns were intermediate between village and city. In Kodiak City, there were five core wild foods – halibut, coho, sockeye, deer, and king crab. In Cordova there were eight – halibut, coho, sockeye, deer, chinook, moose, red rockfish, and razor clams. In Seldovia there were seven. This is a relatively narrow set of wild foods, compared with the range of food possibilities within the local environment. As Euroamericans have moved to the Gulf of Alaska, immigrant families have selectively adopted some wild food types that are traditional for the region. Still, the diversity of food types was substantially lower in the cities and towns compared with the wild foods in the core diets of the villages.

A final measure of the subsistence sector is the Wild Food Distribution Index, which is the percentage of food types received by households through noncommercial distribution networks. In villages, a substantially larger number of wild food types are distributed among households than in cities (Table V-17). About 15 to 19 percent of available food types were reported received by village households during the survey period, while in the cities, only 4 to 5 percent of wild foods were distributed. At 8 to 9 percent, the towns of Cordova, Kodiak City, and Seldovia were intermediate between village and city. In Pacific Gulf villages the distribution of substantial numbers of wild foods is part of the mixed, subsistence-cash economic system, through which households receive basic food provisions. In cities, the sharing of a few wild foods is part of the predominant sport harvesting tradition.

Wage-Market Sector Characteristics

The socioeconomic systems of villages and cities in the Pacific Gulf differed substantially in terms of the strength of the wage-market sector, as shown by three measures in Table V-17. The wage-market

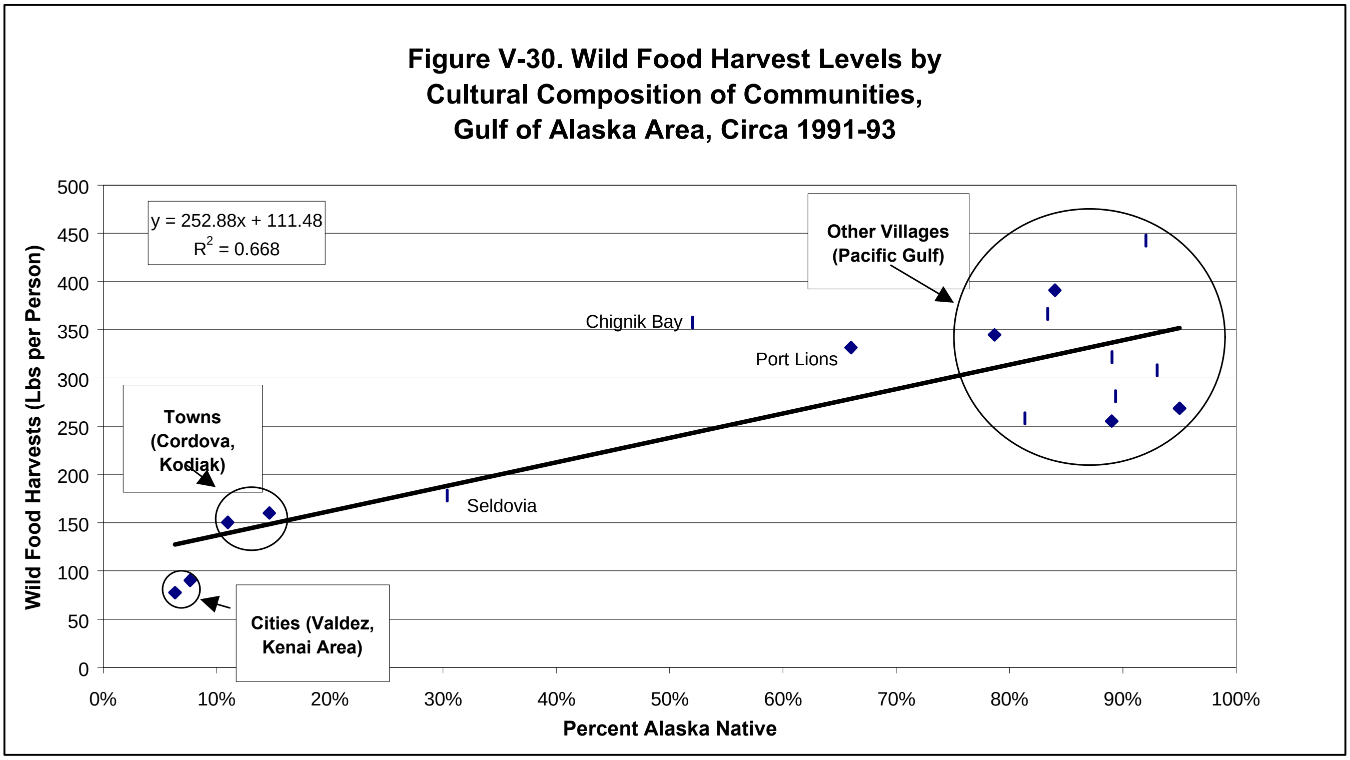


Figure V-30. Wild Food Harvest Levels by
Cultural Composition of Communities,
Gulf of Alaska Area, Circa 1991-93
y = 252.88x + 111.48
R2 = 0.668
Other Villages
(Pacific Gulf)
Chignik Bay
Port Lions
Towns
(Cordova,
Kodiak)
Seldovia
Cities (Valdez,
Kenai Area)
Wild Food Harvests (Lbs per Person)
Percent Alaska Native
500
450
400
350
300
250
200
150
100
50
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

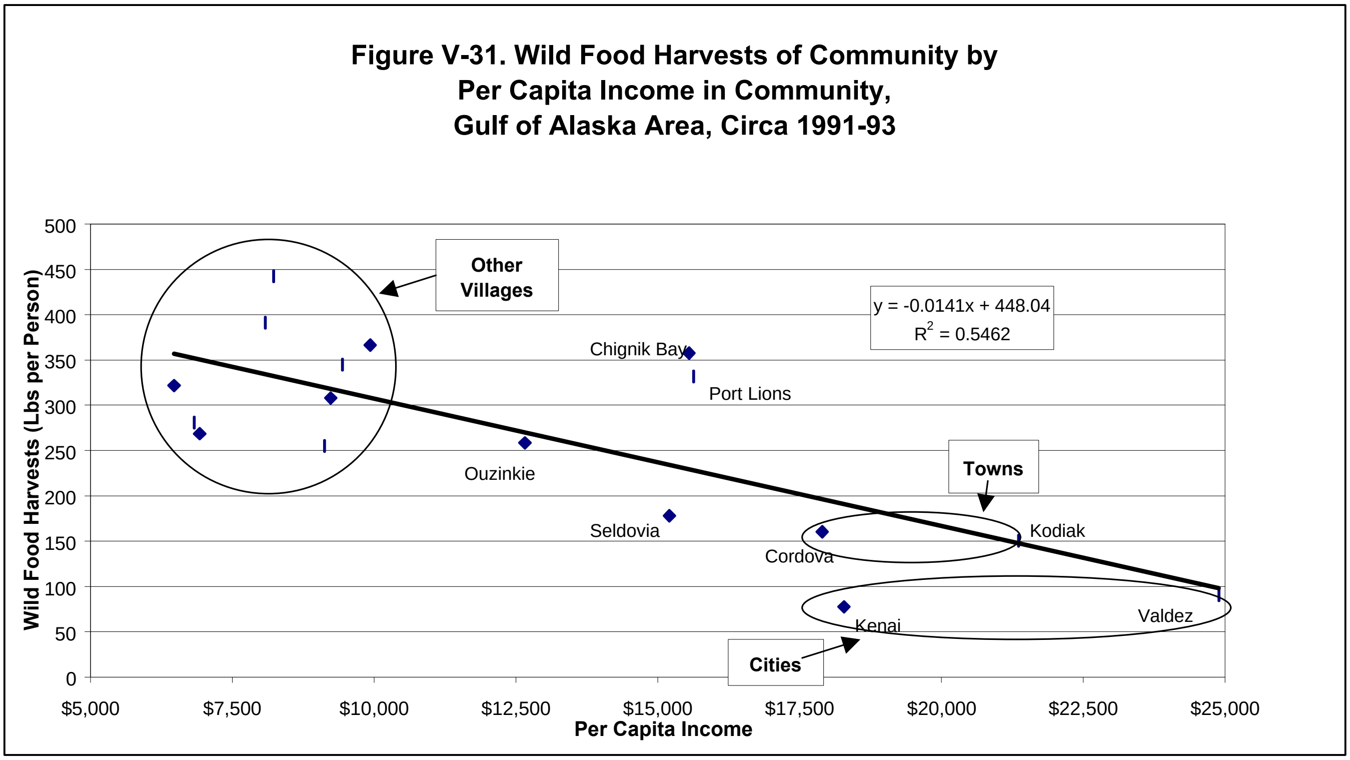


Figure V-31. Wild Food Harvests of Community by
Per Capita Income in Community,
Gulf of Alaska Area, Circa 1991-93
Other
Villages
y = -0.0141x + 448.04
R2 = 0.5462
Chignik Bay
Port Lions
Ouzinkie
Towns
Seldovia
Kodiak
Cordova
Kenai
Valdez
Cities
Wild Food Harvests (Lbs per Person)
Per Capita Income
500
450
400
350
300
250
200
150
100
50
0
$5,000
$7,500
$10,000
$12,500
$15,000
$17,500
$20,000
$22,500
$25,000

Table V-19. Core Foods Index (Wild Foods Used by the Majority of Community Households), Gulf of Alaska, Circa 1991-93 (Percent of Households Using the Resource Category)

	"Villages"															"Towns"			"Cities"	
	PWS-Lower Cook Inlet				Kodiak Island						Alaska Peninsula									
Wild Food Type	Nanwalek	Port Graham	Tatitlek	Chenega Bay	Ahkiok	Old Harbor	Larsen Bay	Karluk	Ouzinkie	Port Lions	Ivanof Bay	Perryville	Chignik Lake	Chignik Lagoon	Chignik Bay	Seldovia	Cordova	Kodiak City	Kenai	Valdez
Halibut	100	96	90	91	75	95	83	92	84	93	100	96	92	100	90	85	94	86	72	71
Coho Salmon	100	88	95	74	88	88	80	92	90	93	86	82	63	60	63	60	86	76	55	51
Sockeye Salmon	94	84	95	96	79	76	88	92	80	93	86	74	79	93	87	57	82	71	67	
Butter Clams	85	84			63	86	83	69	79	91	71		83	67	50	79				
Deer			95	83	75	93	90	100	89	80					50		66	70		
Chinook Salmon	85	94	70				55	77			57		58	80	53	82	78			
Octopus	70	73	65	61	58		80	62			71	52	79		60					
Pink Salmon	91	94	80	61	88	83			61	56	86	78								
Black Chitons	97	96			67	57	53	62	59		100	93	75							
Harbor Seal	85	78	95	57	71	60					86	63	71							
Moose	67	55										74	58	60	50		67		52	
Pacific Cod (Grey)	67					50	50		51	53	86	63		60						
Tanner Crab						76	80			71			67	67	80	52				
Chum Salmon		78	60	65	96	57					71	52								
Sea Urchin					50	62	50				100	89	71							
Caribou											100	67	100	73	87					
Dolly Varden	79	63						77			86	56								
Dungeness Crab						52					100	52	63		77					
Ptarmigan											100	93	83	53						
Cockles					63						100	70	71							
Gull Eggs			55		67						86	63								
Eulachon											100	78	63							
Mallard						74					86			60						
Red Rockfish			55	74													53			
Sea Lion	58		50		67															
Emperor Geese											100			53						
Brown Bear											100	52								
Littleneck Clams													83			66				
Bull Kelp	82	57																		
Steelhead							68	54												
Pacific Tom Cod	64	55																		
King Crab					63													51		
Goldeneye						50			51											
Red Chitons											86									
Black Bear	82																			
Pinkneck Clams											71									
Herring			70																	
Shrimp				61																
Razor Clams																	59			
Snails	58																			
Landlocked Salmon											57									
Rainbow Trout											57									
Porcupine											57									
Teal											57									
Black Scoter			55																	
Index Total	17	14	14	10	15	15	12	10	9	8	28	19	17	12	11	7	8	5	4	2

Source: ADF&G 2001

sector was not well developed in Pacific Gulf villages. Per capita monetary incomes were low – Prince William Sound-Lower Cook Inlet ($8,655), Kodiak Island villages ($9,948), and Alaska Peninsula villages ($11,889). Only a small percentage of adults held year-round employment (14 to 26 percent). Working adults were employed an average of 7.2 to 7.5 months. By comparison, incomes in the cities were about twice that of the villages – Valdez ($24,885) and Kenai ($18,283). Most adults held year-round jobs (63 to 67 percent). Working adults were employed an average of 10.0 to 10.3 months, about a third longer than in Pacific Gulf villages. As stated in Chapter Two, the socioeconomic systems in Valdez and Kenai were examples of industrial capitalism, the predominant socioeconomic system in the United States. In this type of economic system, production and distribution of goods and services are primarily commercial activities. The strength of a community's economy is measured by the strength of wage-market activities. The socioeconomic systems of Pacific Gulf villages were variants of a mixed, subsistence-cash economy, where production and distribution of goods and services are produced through two, loosely integrated sectors. The wage-market sector is typically weak, and households commonly are supported by combining activities in both economic sectors. There was a significant inverse statistical relationship between income and wild food harvest levels for Pacific Gulf communities, as shown in Figure V-31. Communities with lower per capita incomes displayed higher per capita wild food harvests, illustrating the connection between the strength of the two sectors. In the cities and towns with higher per capita incomes, households had lower per capita harvests of wild foods.

In the three towns (Cordova, Kodiak City, and Seldovia), about 41 to 52 percent of adults reported year-round employment, a value intermediate between village and city. On two other economic measures, towns were more similar to cities than to villages, indicating the stronger wage-market sectors compared with villages. Per capita incomes and months employed by working adults in the towns resembled those for the cities – Kodiak City ($21,354, 10.0 months), Cordova ($17,901, 9.7 months), and Seldovia ($15,205, 9 months). During the mid-1990s, the availability of employment was substantially better in Pacific Gulf towns than in villages. The strength of the wage sector was a reason for the greater population growth of towns compared with the villages.

One important difference between town and city in the Pacific Gulf was the strength of the commercial fishing industry. The per capita incomes from commercial fisheries in the towns (Cordova, $4,066; Kodiak City, $4,005; and Seldovia, $3,794) were substantially greater than in the cities (Valdez, $418; Kenai, $467). Employment in Valdez and Kenai was more closely linked to other industries than commercial fisheries. There were substantial differences between villages in the strength of the commercial fishing industry, with the greatest income earned in Alaska Peninsula villages ($4,470) and the least in Prince William Sound-Lower Cook Inlet villages ($674), with Kodiak Island villages intermediate ($2,382) (see also Chapter Four).

Income differences between Alaska Native households and non-Native households, by community type, are shown in Figure V-32 (see also Table V-20). Income is broken out into three categories – wage income, other earned income, and entitlements – using the means for the 1991-93

Figure V-32. Per Capita Income of Native or Non-Native Households by Community Type, Gulf of Alaska, Mean 1991-93

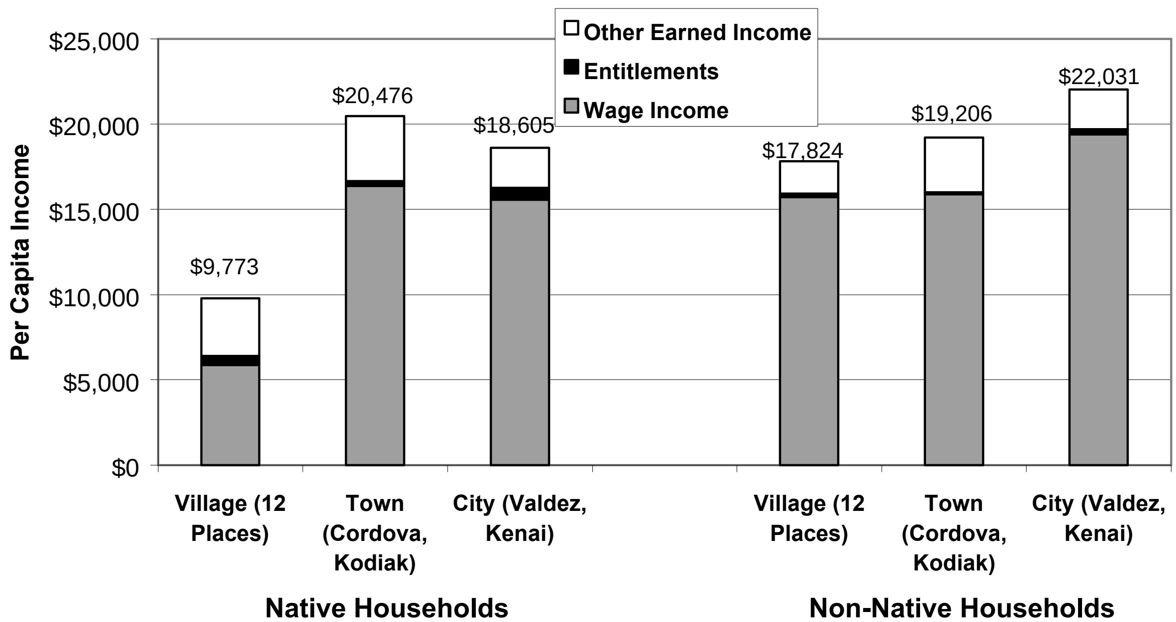


Table V-20. Household Incomes (Per Capita)
(Monetary Incomes plus Wild Food Replacement Values)
by Native or Non-Native Households,
and Community Type, Gulf of Alaska, Mean 1991-93

	Native Households			Non-Native Households		
	Village (12 Places)	Town (Cordova, Kodiak)	City (Valdez, Kenai)	Village (12 Places)	Town (Cordova, Kodiak)	City (Valdez, Kenai)
Wage Income	$5,887	$16,371	$15,560	$15,727	$15,876	$19,393
Other Earned Income	$3,369	$3,812	$2,345	$1,898	$3,213	$2,329
Entitlements	$517	$293	$700	$199	$117	$308
Monetary Income	*$9,773*	*$20,476*	*$18,605*	*$17,824*	*$19,206*	*$22,031*
Wild Foods @ $20/lb*	$7,100	$4,420	$3,940	$4,660	$3,040	$1,700
Total Estimated Income	*$16,873*	*$24,896*	*$22,545*	*$22,484*	*$22,246*	*$23,731*
Wild Foods @ $118/lb**	$41,890	$26,078	$23,246	$27,494	$17,936	$10,030
Total Estimated Income	*$51,663*	*$46,554*	*$41,851*	*$45,318*	*$37,142*	*$32,061*

* Replacement cost of nutritional value of wild foods, based on civil settlement (Duffield 1997)
** Consumer surplus value of wild foods, based on hedonic (implicit price) method (Duffield 1997)

survey years. Mean per capita incomes for Alaska Native households were $9,773 (village), $20,476 (town), and $18,605 (city) (Fig. V-32). Mean per capita incomes for non-Native households were $17,824 (village), $19,206 (town), and $22,031 (city). [2]

In all community types, wage employment (including self employment in commercial fisheries) provided the most income to households. Because of the limited employment opportunities, per capita wage incomes were lowest for Alaska Native households in Pacific Gulf villages. Wage incomes of Alaska Native households in towns ($16,371) and cities ($15,560) were twice wage incomes in villages ($5,887). Per capita wage incomes of non-Native households in villages ($15,727) were also substantially larger than for Native households ($5,887). This shows that higher-paying jobs in the villages were disproportionately held by non-Natives. In the towns of Cordova and Kodiak, wage incomes were similar for non-Native households ($15,876) and Native households ($16,371). In the cities of Valdez and Kenai, non-Native households had larger wage incomes ($19,393) than Native households ($15,560).

"Other earned income" primarily derived from dividend payments and retirement income. Mean per capita incomes from these sources were fairly consistent across all community types for Native and non-Native households. This is because the primary source of income in this category was the Alaska Permanent Fund Dividend payment, which was equally distributed to each Alaskan with at least one year of residency. In Pacific Gulf villages, where wage employment opportunities were limited, dividend incomes represented 37 percent of earned income of Native households, a significant source of annual income. A comparison of other earned income of Native and non-Native households in Table V-20 suggests that Alaska Native shareholders received only modest dividend payments from village and regional Native corporations during 1991-93.

"Entitlements" contributed only a small portion of household income in Pacific Gulf communities. Entitlements included Aid to Family with Dependent Children, Supplemental Security Income (disability support), food stamps, and Medicare. For Alaska Native households, mean per capita entitlement income ranged from $293 to $700, about 1.4 percent to 3.8 percent of total household income (Table V-20). For non-Native households, mean per capita entitlement income ranged from $117 to $308, about 0.6 percent to 1.4 percent of total household income.

In addition to monetary incomes, wild food harvests contributed income-in-kind to Native and non-Native households. Subsistence harvests by Native and non-Native households are compared for village, town, and city in Figure V-33. On average, Native households produced larger harvests of wild foods than non-Native households, a situation consistent across village, town, and city. Wild food harvests were largest in the villages. Non-Native village households produced more wild foods than Native households in the towns and cities.

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[2] The analysis reported in Figures V-32 to V-35 and Table 20, includes in the "village" category Chenega Bay, Tatitlek, Nanwalek, Port Graham, Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, Port Lions, Chignik, and Chignik Lake. As a small "town" with a stable population, Seldovia was not included in this analysis.

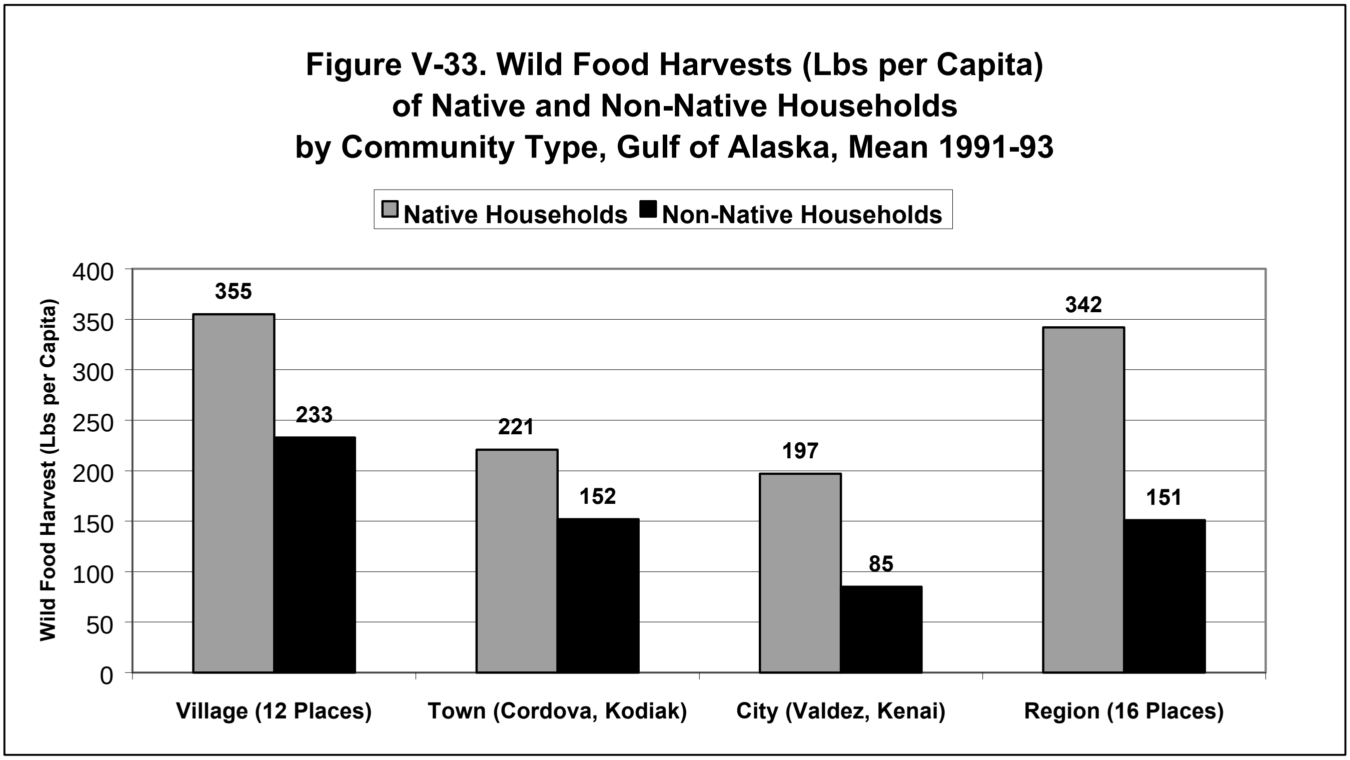


Figure V-33. Wild Food Harvests (Lbs per Capita)
of Native and Non-Native Households
by Community Type, Gulf of Alaska, Mean 1991-93
Native Households
Non-Native Households
Wild Food Harvest (Lbs per Capita)
400
350
300
250
200
150
100
50
0
355
233
221
152
197
85
342
151
Village (12 Places)
Town (Cordova, Kodiak)
City (Valdez, Kenai)
Region (16 Places)

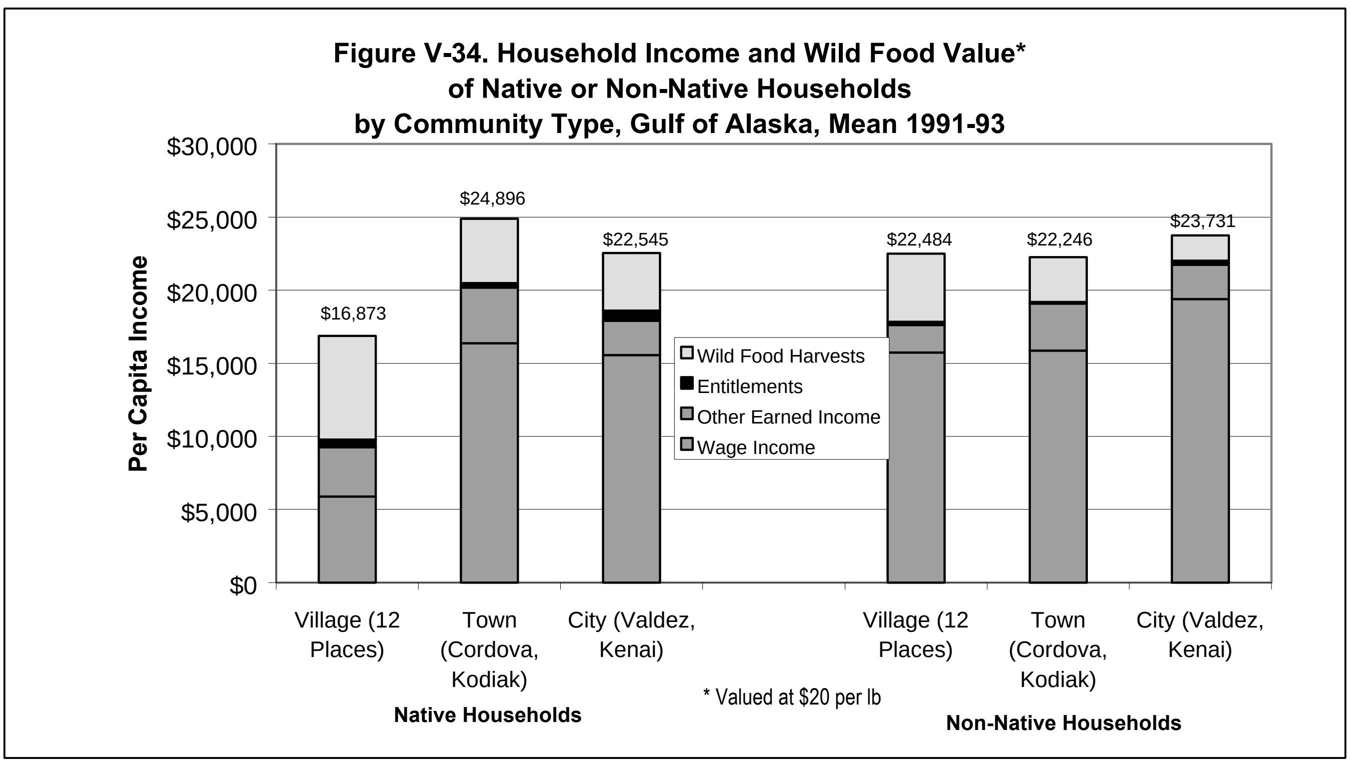
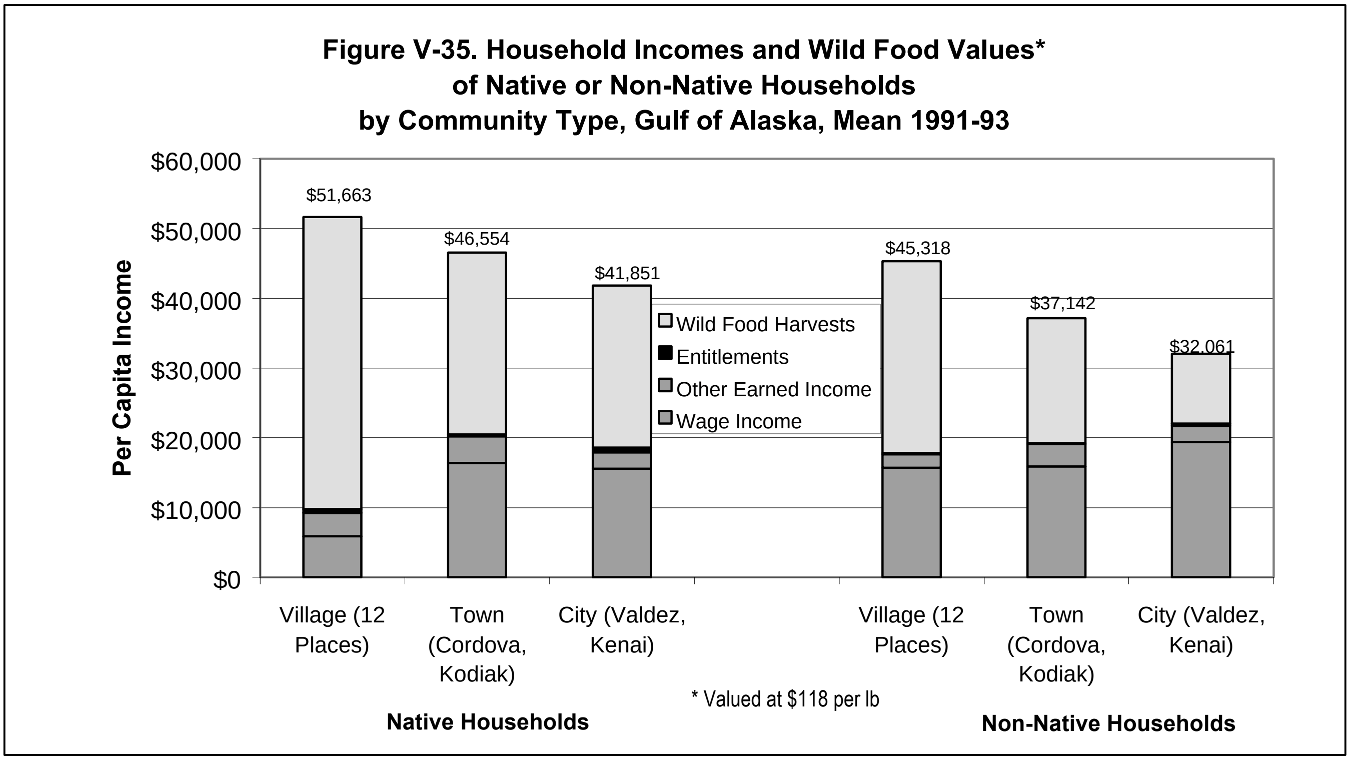


Figure V-34. Household Income and Wild Food Value*
of Native or Non-Native Households
by Community Type, Gulf of Alaska, Mean 1991-93
Per Capita Income
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
$16,873
$24,896
$22,545
$22,484
$22,246
$23,731
Wild Food Harvests
Entitlements
Other Earned Income
Wage Income
Village (12 Places)
Town (Cordova, Kodiak)
City (Valdez, Kenai)
Native Households
* Valued at $20 per lb
Village (12 Places)
Town (Cordova, Kodiak)
City (Valdez, Kenai)
Non-Native Households



Figures V-34 and V-35 provide estimates of the monetary value of wild food harvests in villages, towns, and cities, for comparison with household monetary incomes. In Figure V-34, the value of wild food harvests was estimated at $20 per pound. This was the value accepted in the Native class civil settlement for lost subsistence foods, calculated with a simple replacement cost methodology (Duffield 1997). It represents a monetary estimate of the nutritional value of wild foods to households. It does not include estimates of other social and cultural values of subsistence activities. At $20 per pound, subsistence activities provide more income to Native households in villages than other income sources. For Native households in Pacific Gulf villages, the mean per capita value of the wild food harvest ($7,100) was larger than the income from wages ($5,887) and other earned income ($3,369). Native households in towns had higher incomes than non-Native households in the cities, if the value of wild foods is included. While the incomes of Native households in villages increased by including wild foods, incomes in villages were still lower than in towns and cities.

In Figure V-35, the value of wild food harvests was estimated at $118 per pound. This derives from a hedonic (implicit price) method developed by Duffield (1997). In this method, the value of subsistence harvests was estimated by the opportunity cost of foregone wages by living in a village instead of an urban area. It represents an estimate of the consumer surplus to households derived from the procurement and use of wild foods. It may be considered a measure of the contribution of wild foods to the overall well being of households living in a particular place. The court did not accept this estimate in the civil settlement because it included social and cultural values (Duffield 1997). At $118 per pound, Native households in the villages had higher incomes than Native households in the towns and cities. Native households in the villages also had substantially higher incomes than non-Native households in the towns and cities.

While $20 per pound may underestimate the value of wild food harvest and use to villagers relative to wage incomes, $118 per pound probably overestimates its economic value. If Native householders were substantially better off in villages compared with towns and cities, one might expect to see this reflected in differential migration of people into the villages. That is not what is seen over time. Instead, village populations in the Pacific Gulf tend to show only modest growth over time, with differential out-migration to the towns and cities. Nevertheless, by including subsistence production in calculations, the economic incomes of Native households show greater parity with non-Native households. Further, the great economic importance of subsistence products for Native households in villages is also demonstrated.

SUMMARY AND CONCLUSIONS

This chapter has summarized some key characteristics of the three types of communities of the Pacific Gulf in the 1980s (villages, town, and cities). These contrasting community types were the result of demographic, economic, and political processes at work in the 19^{th} and especially the 20^{th} century. In terms of demographic trends, the Alaska Native communities (the villages) overall had exhibited stable populations, or a rate of growth below that of Alaska's Native population overall and of the towns and cities of the Pacific Gulf region. By the end of the 1980s, the majority of Alaska Natives in the region did not live in villages. Intermarriage with non-Natives was the norm in the towns and cites and was becoming more common in some of the villages.

The subsistence sectors of the local economies of the villages were strong, as evidenced by harvest levels that were in the mid-range of those of other rural Alaska communities, and higher than those of cities and towns. Harvests were diverse and there was virtually universal participation in the use, harvest, and exchange of wild foods. Subsistence uses were filled with cultural meanings, linking people to the land and their history, and to each other as kinship structured harvesting, processing, and sharing. Nevertheless, there was a sense of change expressed by some village residents in the 1980s that subsistence traditions were being lost with the importation of purchased foods.

In contrast to the strength of the subsistence sector, the cash sectors of the local economies of the villages and a lesser extent the towns was less developed. Employment was seasonal, the variety of jobs low, and incomes below those found in Alaska's urban areas. Commercial fishing was a significant part of the cash sectors of the economies in most villages and town. Here, too, there was a sense of change. In some communities, local residents were selling their limited entry commercial fishing permits. Part-time and seasonal wage jobs supported by government programs were increasing in importance as a source of cash.

Social and political organizations were complex within Pacific Gulf communities. Political power was dispersed among tribal councils, municipal governments, and borough governments. These entities were involved in economic enterprise and social programs, with village corporations, for-profit regional corporations, and not-for-profit regional service organizations. Alongside these formal organizations, kinship remained the primary organizing principle of daily life in the villages. Some cultural systems have changed substantially over the 20th century. Few if any children spoke the Alutiiq language in the villages. There were few Native dance groups, and knowledge of Native songs was fading. Oral traditions were being lost. On the other hand, Russian Orthodoxy as a "Native" faith, a syncretism of Christianity and Alutiiq traditions, continued to shape an annual cycle of observances and celebrations. And social, political, and cultural revitalization was a growing trend among the Alutiiq of the Pacific Gulf during the last part of the 20th century. These features of the communities of the Pacific Gulf in the 1980s, themselves dynamic, set the stage for changes set in motion by the *Exxon Valdez* oil spill of March 1989, the subject of the next several chapters.

Chapter Six: The *Exxon Valdez* Oil Spill: Effects, Litigation, and Restoration

OVERVIEW OF THE OIL SPILL AND CLEANUP

The oil tanker *Exxon Valdez* grounded on Bligh Reef in eastern Prince William Sound on March 24, 1989, spilling 11 million gallons of crude oil (258,000 barrels). Winds, tides, and currents carried the oil to the west and south, contaminating about 1,200 miles of shoreline, and killing or injuring birds, sea mammals, and other marine life (U.S. Coast Guard 1993; ADF&G 1989a:8-10,21).[1] Although not visible directly from Tatitlek, Bligh Reef is only about six miles from the village. Most of the beaches and waters used by residents of Chenega Bay since the re-establishment of the village lay directly in the path of the spill. Residents of the other Prince William Sound communities of Tatitlek, Cordova, Valdez, and Whittier also used these areas (Stratton and Chisum 1986; Stratton 1990; Stratton 1992; Seitz et al. 1994).

Until about mid-April, much of the response effort in Prince William Sound focused on protecting three salmon hatcheries from the spilled oil. By April 5, fishing boats from Valdez and Cordova had deployed about 66,000 feet of oil containment boom around the Armin F. Koernig Hatchery at Sawmill Bay on Evans Island near Chenega Bay village (Alaska Oil Spill Commission 1990:65). The people of Chenega Bay played a central role in this effort (Piper 1993:96). Booms were also placed to protect hatcheries at Main Bay and Esther Island, as well as Eshamy Bay, a critical natural spawning area for salmon (ADF&G 1989a:9; U.S. Coast Guard 1993:58-61).

Figure VI-1 illustrates the movement of EVOS oil, sheen, and mousse for the first 56 days after the spill. The leading edge of the oil began to leave Prince William Sound to the west about seven days after the spill. Tar balls and mousse began washing shore along the outer coast of the Kenai Peninsula, including the Kenai Fiords National Park, at about this time. Tides and prevailing currents carried the spill up into Cook Inlet and Kachemak Bay by about April 15. Soon afterwards, local fishermen and loggers worked together to build and deploy boom to protect key bays and coves. There was increasing frustration with the perceived slow response of Exxon, especially after storms washed up sheen and emulsified oil along the outer Kenai coast, on Homer Spit, and near Seldovia (Davidson 1990:255-259).

Oil from the *Exxon Valdez* began washing up on beaches of the Kodiak Archipelago on April 17, about three weeks after the spill (Endter-Wada et al. 1993:663). Exxon established a major base of operations for the cleanup in Kodiak City by late April (Endter-Wada et al. 1993:666). The patchy and

[1] For detailed descriptions of the spill and subsequent cleanup activities, the reader should consult, among other sources, the Alaska Oil Spill Commission's (1990) final report, the final report of the federal on-scene coordinator (U.S. Coast Guard 1993), and the final report of the State of Alaska's response to the spill (Piper 1993). For accounts of the oil spill, the cleanup, and their aftermath for a general readership, see Davidson (1990), Keeble (1991), Wheelright (1994), and Lord (1992). The chapter on "Native Subsistence" in the latter is based largely on Fall (1991b).

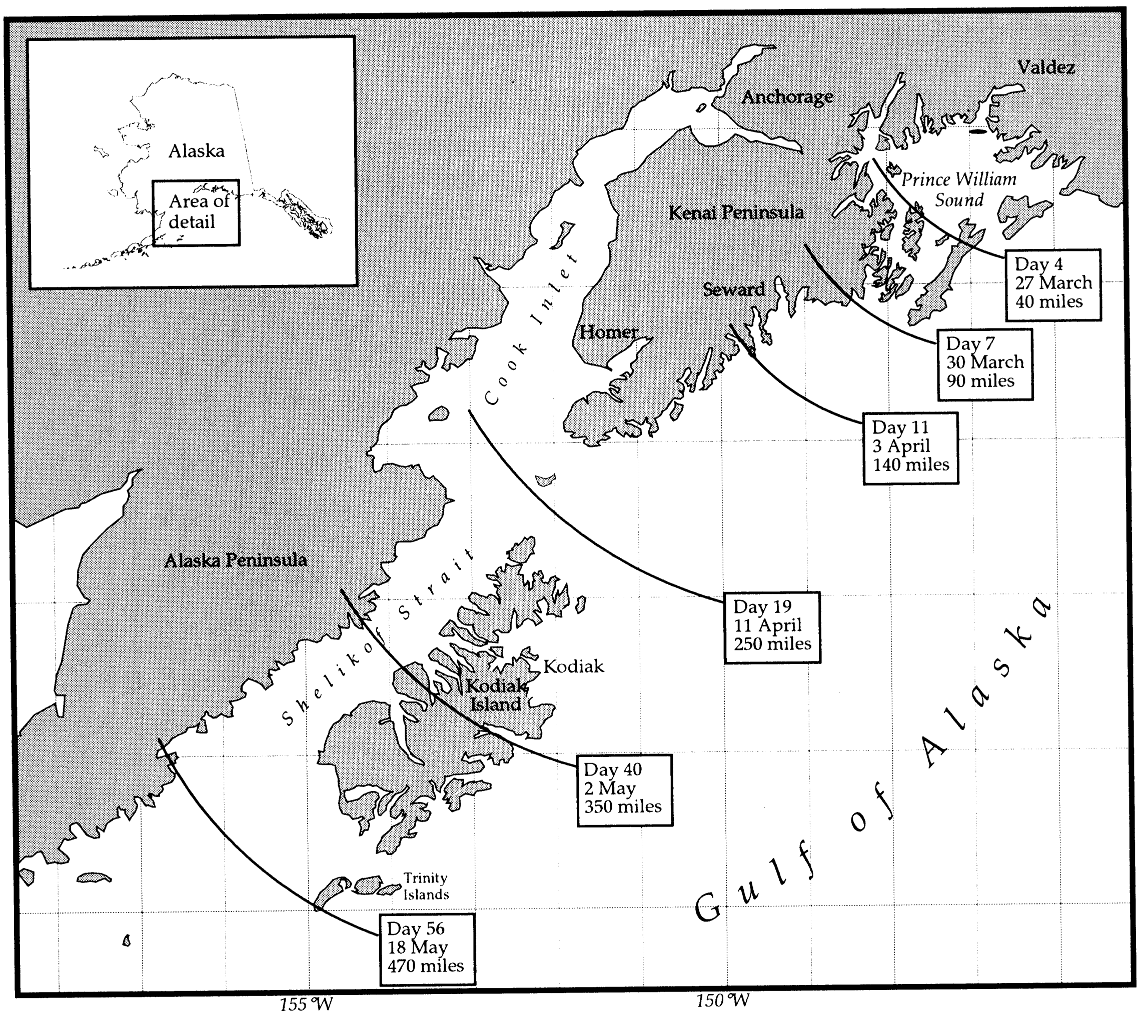


Figure 6.1. Progression of oil through Prince William Sound and the Gulf of Alaska for the first days after the grounding of the *Exxon Valdez*.

Source: US Coast Guard 1993:124

dispersed nature of the spilled oil in the Kodiak Island area created particularly frustrating and disheartening conditions for local residents engaged in the cleanup.

> Some [Kodiak] residents expressed despair and fatigue as areas that had already been cleaned were hit again with “mousse” (emulsified oil) or had oil percolate up from below. “It’s like taking ground again and again in a battle,” remarked one resident. Others likened cleanup operations to a guerrilla war, where puffs of smoke come up and then disappear, only to reappear somewhere else. Indeed, the oil-spill headquarters operated like command posts. Said one National Park Service employee, “We keep hoping for some kind of closure, some sign that this is all the damage that we have and we can deal with it. But we can’t. The oil disappears one day when the waves clean a beach only to wash up on another beach the next day” (Endter-Wada et al. 1993:689).

On April 18, light oiling was spotted at Cape Douglas, the northeastern-most tip of the Alaska Peninsula, within the Katmai National Park. Six days later, oil arrived at Kukak Bay, 50 miles to the south, and then moved on to Missark Bay and Kashvik Bay (Hanable 1990:77). Effects on wildlife along the Alaska Peninsula coast were observed. Officials of the National Park Service counted six dead birds per 100 feet within a six-mile section of the Katmai National Park coast on May 2. Fourteen brown bears were spotted feeding on the oiled carcasses (Hanable 1990:80). By this time, about 320 miles of the park's coastline had been impacted, with many miles heavily oiled; some beaches "smelled like a refinery with oil rolling in the surf and smearing the sand" (Hanable 1990:80,82-3).

As of May 19, surveys by the Alaska Department of Environmental Conservation had documented 700 miles of oiled coastline. By this date, 16,007 dead birds and 690 dead sea otters had been recovered (ADF&G 1989a:21). By May 18, the leading edge of the oil spill had reached Wide Bay within the Alaska Peninsula National Wildlife Refuge (Alaska Oil Spill Commission 1990:62). Wide Bay is the northern-most section of the Alaska Peninsula coast used for subsistence purposes by residents of the Alaska Peninsula study communities. Even earlier, on May 5, the U.S. Fish and Wildlife Service (USFWS) had reported "small patches of mousse south of Chignik in Castle Bay" (USFWS 1989a:1). On May 9, the USFWS reported "scattered patches of sheen and mousse from Chignik south to Stepovak Bay" (USFWS 1989b:1).

By this chronology, oil from the *Exxon Valdez* spill had reached the northern edge of the Chignik commercial fisheries management area at least by late May and early June (Barrett and Monkiewicz 1989:1). As the spill proceeded southwest, it fouled additional beaches in the wildlife refuge and along the shores of the Aniakchak National Monument. Of Aniakchak's 68 miles of coastline, two-thirds showed signs of oiling (Hanable 1990:82). By August 10, the outer edge of the spill was at Stepovak Bay, southwest of the village of Ivanof Bay, over 600 miles from Bligh Reef (ADF&G 1989a:20-21).

The degree to which shorelines were oiled varied both within and between regions. The Shoreline Cleanup Assessment Team (SCAT) survey of September 1989 classified 26.5 percent of the oiled shoreline of Prince William Sound as "heavily oiled," 20.7 percent of the oiling as “moderate,” 34.2 percent as “light,” and 18.6 percent as “very light.” In contrast, only 7.9 percent of the oiled shorelines outside of

Prince William Sound was classified as heavily or moderately oiled, 14.6 percent as lightly oiled, and the remainder (77.5 percent) was classified as very lightly oiled (U.S. Coast Guard 1993:125).[2]

THE CLEANUP RESPONSE

On about April 12, the spill response work in the sound shifted from protection of hatcheries to cleaning oil from waters and beaches. The cleanup was fully underway by the middle of May (ADF&G 1989a:13; State of Alaska 1989:15). Eventually about 11,000 workers, as well as hundreds of boats and aircraft, were employed on the cleanup in 1989 (Alaska Oil Spill Commission 1990:63). Oil cleanup methods included hot and cold water washing with high pressure hosing, removing and bagging oiled debris and wildlife by hand or with rakes for later pick up, and wiping rocks with rags. A chemical cleaning agent called COREXIT 9580 was used to treat some beaches. Another method used was bioremediation, the spreading of fertilizer to enhance the growth of oil-eating bacteria on the beaches (State of Alaska 1989:17-19).

As reported in Table VI-1, the majority of adults in Chenega Bay, Tatitlek, Nanwalek, Port Graham, Karluk, Larsen Bay, and Ouzinkie participated in the cleanup, as did over 20 percent in Akhiok, Old Harbor, Port Lions, and Perryville. Of all adults in the 15 Alaska Native villages in the spill area, 42.9 percent had oil spill cleanup jobs in 1989; 54.7 percent of all adults who worked in 1989 had cleanup jobs. By subregion, 77.3 percent of all households in the Prince William Sound villages of Chenega Bay and Tatitlek had at least one member who worked in the cleanup, as did 81.4 percent of the Lower Cook Inlet households (Nanwalek and Port Graham), 61.5 percent of the households in the six villages of the Kodiak Island Borough, and 20.6 percent of the Alaska Peninsula households. Overall, about half the income earned from jobs in 1989 in the 15 villages came from oil spill employment; this ranged from a low of about 12 percent in the Alaska Peninsula communities to almost 75 percent among Lower Cook Inlet communities (Table VI-2).

Exxon estimated that it spent $2 billion on the cleanup in 1989. Cleanup efforts took place in Prince William Sound, lower Cook Inlet, the Kodiak Islands, and portions of the Alaska Peninsula. As noted by Piper (1993:114), "the towns and villages of the oil spill region were turned upside down by the staging, logistics, and politics of the response," as thousands of newcomers arrived looking for work, placing severe strains on facilities and services. The acute fiscal, social, and political effects of the cleanup are discussed in Impact Assessment Inc. [IAI] (1990a, 1990b, 1990c, 1990d; see also IAI 1998).

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[2] Oil impact categories were as follows: heavy or wide = a band greater than six meters in width and greater than 50 percent oil cover; medium = a band greater than six meters in width and less than 50 percent oil cover, or a band three to six meters in width and greater than 10 percent oil cover; light or narrow = a band less than three meters in width and less than 10 percent oil cover; and very light = less than 10 percent oil cover regardless of width (Dewhurst et al. 1990:11).

Table VI-1. Oil Spill Employment Characteristics of 15 Alaska Native Communities, 1989

Characteristics	Prince William Sound Subregion		Lower Cook Inlet Subregion		Kodiak Island Borough Subregion						Alaska Peninsula Subregion				
	Chenega Bay	Tatitlek	Nanwalek	Port Graham	Akhiok	Karluk	Larsen Bay	Old Harbor	Ouzinkie	Port Lions	Chignik Bay	Chignik Lagoon	Chignik Lake	Ivanof Bay	Perry-ville
ADULTS															
Total	44	68	84	114	27	38	86	174	146	141	72	28	64	19	73
Employed Adults	39	55	70	95	21	30	75	124	122	106	59	21	47	13	51
Employed in Oil Spill (OS) Jobs															
Number of Adults	26	34	62	71	13	22	56	45	87	61	8	2	1	1	17
% of All Adults	57.9%	50.9%	73.5%	62.2%	47.6%	58.1%	65.3%	25.6%	59.5%	43.4%	10.8%	7.1%	2.1%	5.3%	23.4%
% of Employed Adults	66.7%	62.8%	89.3%	74.7%	62.5%	72.0%	75.4%	35.9%	71.0%	57.9%	13.2%	9.5%	2.9%	7.7%	34.1%
Number of Oil Spill Jobs	30	43	78	81	13	23	61	45	89	71	8	2	1	1	18
Percentage of All Jobs	40.0%	48.6%	70.8%	58.2%	35.7%	41.3%	44.2%	22.3%	39.8%	32.5%	7.7%	5.3%	1.4%	4.3%	21.9%
HOUSEHOLDS (HHs)															
Total Number of HHs	21	28	41	61	13	17	39	93	69	67	39	15	28	7	31
Number of Employed HHs	21	28	40	56	13	17	36	85	61	52	39	15	25	7	26
Number with OS Employment	16	22	39	44	12	13	31	37	51	39	8	2	1	1	13
% of All HHs	77.8%	77.3%	93.94	72.92	90.0%	78.6%	79.4%	39.6%	74.3%	58.3%	20.0%	13.3%	4.8%	14.3%	40.7%
% of Employed HHs	77.8%	77.3%	96.88	79.55	90.0%	78.6%	87.1%	43.2%	83.9%	75.0%	20.0%	13.3%	5.3%	14.3%	47.8%
INCOME															
% of All Income from OS Employment	61.7%	44.1%	67.5%	59.5%	33.0%	40.5%	52.4%	21.2%	50.4%	34.7%	7.9%	8.3%	0.1%	1.5%	17.9%
% of Earned Income from OS Employment	66.7%	60.7%	79.2%	70.5%	49.9%	57.2%	67.9%	40.9%	64.1%	48.5%	9.9%	9.5%	0.2%	1.9%	22.7%
Income from OS Employment															
Average Household	$47,453	$31,265	$31,414	$20,931	$15,413	$14,057	$23,849	$8,936	$25,479	$19,167	$3,106	$6,000	$52	$571	$10,317
Per Capita	$13,558	$7,906	$8,228	$7,911	$3,584	$3,280	$7,113	$2,979	$8,034	$6,571	$1,007	$2,195	$13	$125	$2,758

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990.

Table VI-2. Oil Spill Employment Characteristics of 15 Alaska Native Communities by Subregion, 1989

Characteristics	Subregions: Prince William Sound	Lower Cook Inlet	Kodiak Island Borough	Alaska Peninsula	All Subregions
ADULTS					
Total	112	199	613	257	1,180
Employed Adults	93	165	478	190	926
Employed in Oil Spill (OS) Jobs					
Number of Adults	60	133	284	29	507
% of All Adults	53.8%	67.0%	46.3%	11.4%	42.9%
% of Employed Adults	64.5%	80.8%	59.4%	15.4%	54.7%
Number of Oil Spill Jobs	74	160	301	31	565
Percentage of All Jobs	44.6%	63.7%	34.6%	9.0%	34.7%
HOUSEHOLDS (HHs)					
Total Number of HHs	49	102	298	120	569
Number of Employed HHs	49	96	264	113	521
Number with OS Employment	38	83	183	25	329
% of All HHs	77.3%	81.4%	61.5%	20.6%	57.8%
% of Employed HHs	77.3%	86.7%	69.4%	22.0%	63.1%
INCOME					
% of All Income from OS Employment	52.0%	63.3%	37.3%	9.4%	37.3%
% of Earned Income from OS Employment	63.7%	74.6%	54.5%	11.9%	49.8%
Income from Oil Spill Employment					
Average Household	$38,203	$25,145	$17,593	$4,470	$17,954
Per Capita	$10,161	$8,067	$5,503	$1,273	$5,445

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990.

City officials at Chignik Bay organized early oil spill response efforts in the Chignik area, but by May, VECO, an oil field service company, had assumed responsibility for the program (Impact Assessment Inc. 1990c:111-113). Six fishing vessels were chartered by Exxon as "test boats" used by ADF&G Commercial Fisheries Division for monitoring the Chignik Management Area for oil impacts (Barrett and Monkiewicz 1989:1,15). Four of these boats were from Chignik and the other two were from Kodiak, but none belonged to a year-round resident of the Chignik area.

Cleanup efforts along the Alaska Peninsula began in May of 1989, reached full-scale by mid July, and continued until September. Exxon/VECO chartered approximately 12 vessels from Chignik, five of which belonged to full-time residents of the area. Local residents were hired as beach cleanup workers (Aklin 1990; Anderson 1990). In addition, the National Park Service operated its own Exxon-funded cleanup program that focused on national park lands to the northeast of the study communities. Over 95,000 bags of oil-soaked debris were removed from national park lands on the Alaska Peninsula. About 8,400 dead birds were counted in these same areas (Hanable 1990:82).

The first year of cleanup ended on September 15, 1989. At that time, the State of Alaska concluded that spill response was not complete:

> There is still oil on the water and on beaches, and it is moving into new areas every day. Moreover, most of the 200 miles of heavily oiled shoreline in Prince William Sound has substantial amounts of oil still deep in the sand and gravel. It continues to leech to the surface and bleed into the water . . . The job [of cleaning up the spill] is not over (State of Alaska 1989:19).

In total, about 1,244 miles of shoreline had been contaminated by the spill, including 311 miles in Prince William Sound, 100 miles on the Kenai Peninsula, and over 833 miles on the Kodiak Island archipelago and Alaska Peninsula.[3] In Prince William Sound, 199 miles of shoreline had been "treated" during the first year's cleanup efforts, but even these were not necessarily "clean" or "environmentally stable." In 1989, of the 258,000 barrels of oil that had been spilled, 32,500 barrels had been recovered, 77,100 had evaporated, and 114,000 barrels remained in Prince William Sound and the Gulf of Alaska (State of Alaska 1989:25; EVOSTC 1992:2).

From March through May 1990, several residents of the Perryville and Chignik area villages were involved in a winter beach cleanup effort. This state-funded monitoring program was set up for local residents to locate and clean up oil on the beaches and to assist the state in determining if it would be safe to open up the local fishing grounds for the summer of 1990 commercial fisheries. Early in the winter cleanup, local crews had gathered numerous 30-gallon garbage bags full of tar balls found on the region's beaches including those on the Pacific side near Perryville (Hulen 1990).

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[3] These estimates from the Alaska Department of Environmental Conservation (ADEC) represent "actual oiled miles." Discrepancies exist between these estimates and others provided by ADEC, Exxon, and the U.S Coast Guard, because other estimates report the total length of oiled shoreline "segments," portions of which were unoiled (State of Alaska 1989:25). For example, the Shoreline Cleanup Assessment Team (SCAT) Survey in September 1989 identified 3,245.1 miles of oiled shoreline, including 789.6 miles in Prince William Sound and 2,455.5 miles in "western Alaska" (the remainder of the spill area) (U.S. Coast Guard 1993:125).

Although Exxon did not initially commit to a second year of cleanup activities, a scaled down version did take place in 1990, concentrating on more site-specific goals. The 1991 effort was even more limited, with almost all work taking place in Prince William Sound. State and federal officials declared the cleanup complete on June 12, 1992, although they acknowledged that oiled beaches remained. The continued presence of oil in the western sound, including oiled mussel beds, was an important issue for the residents of Chenega Bay. They linked their concerns about subsistence foods safety to this continued presence of oil. In 1994, using EVOS Trustee Council funds (see below), scientists and residents of Chenega Bay removed and replaced contaminated sediments beneath 12 oiled mussel beds (EVOSTC 1996b:6). The Trustee Council also authorized spending up to $1.9 million in 1997 to remove surface and subsurface oil from the southwest sound near Chenega Bay.

From April 26 to August 13, 1990, one year after the Chignik area beaches were first impacted by oil, the U.S. Fish and Wildlife Service conducted shoreline assessments along the Alaska Peninsula, including the Chignik area. The objective of the survey was to determine the extent of oil on refuge coastlines, and its impacts on wildlife and habitat (Dewhurst et al. 1990:1). The largest remaining quantities of oil were observed in the Becharof Refuge, north of the areas used by the study communities for subsistence harvests. Under one percent of the shoreline of the Ugashik Unit of the Alaska Peninsula refuge was classified as having "very light impacts," with the remaining 99 percent classified as having no observable shoreline oil. Shoreline oil observed along the Chignik Unit of this refuge, where most subsistence harvests occur, was also classified as having less than one percent of very light impact coverage, but infrequent patches of oil were still noted throughout the area as far south as Ivanof Bay (Dewhurst et al. 1990:12,14). The assessment also documented various kinds of oil films and sheens throughout the study area, but the study could not show that these were related to the *Exxon Valdez* oil spill (Dewhurst et al. 1990:17). Exxon's cleanup and treatment activities in 1990 did not occur south of Puale Bay (Dewhurst et al. 1990:28).

Local residents continued to provide new reports of the presence of oil contaminants into 1991. For example, in March of 1991, two years after the oil spill, Ivanof Bay residents reported finding pools of oil along Humpback Bay, the nearest bay east of their village (Holmes 1991). Humpback Bay is used by Ivanof Bay and Perryville residents as a primary shellfish collecting and marine mammal hunting area when weather allows for travel. Ivanof Bay residents were concerned that oil floating in the ocean was being carried by winter storms to these beaches, and oiling or re-oiling them. These effects of the spill continued to concern some local residents two years after the event.

ASSESSMENTS OF NATURAL RESOURCE DAMAGES

Contrasting Assessments of Environmental Injury

Once released into the marine environment, crude oil is subject to a variety of weathering processes, such as evaporation and the actions of wind, waves, and bacteria, which affect the toxicity of the oil. A common form of partially weathered oil is mousse, an emulsion of water and oil that may eventually form thick layers on the water's surface or wash on shore to coat beaches and organisms. Oil may adhere to suspended particles in the water and sink. It may also solidify into tarballs or asphalt (Steiner and Byers 1990:14; Lord 1992:12-14).

Certain wildlife populations were severely impacted by the spill by direct contact with the oil. According to a summary of some of the findings of scientific studies of the spill's effects on fish and wildlife, about 3,500 - 5,500 sea otters, 200 harbor seals, and 375,000 - 435,000 birds (such as murres, eagles, and sea ducks) died as a direct result of the spill (EVOSTC 1992:20-26).

The immediate and long-term effects on other wildlife were less clear, however. For example, sea lions swam near oiled areas, and some were observed with oiled pelts, but no sea lion deaths were known to have been caused by the spill. Deer feeding on kelp on beaches in winter likely ingested oiled kelp. However, intensive searches found no evidence of deer dying from ingestion of oil. Analysis of 38 deer found dead in winter habitat found that starvation was the cause of the mortality. A second beach survey in the spring of 1990 also determined that the major source of deer mortality was starvation and “obvious oil-related mortality was not observed” (Lewis 1993a:7). Black bears might also have been exposed to oil when they fed on beach grasses or sedges, dug for clams, or scavenged for birds, but no studies of possible injuries to black bear populations were conducted (ADF&G 1989a:28-30; EVOSTC 1992:19-30; Lewis 1993a).

Within a week of the grounding of the *Exxon Valdez*, planning began on scientific studies to determine the spill’s long-term biological effects (ADF&G 1989a:10). Over 100 "Natural Resource Damage Assessment Studies" (NRDA) were undertaken by government, university, and private-sector researchers. These were coordinated through the EVOS Trustee Council, with representation from three state and three federal agencies (Fraker 1993). Because of the litigation-sensitive nature of the studies, their findings were deemed confidential and results were not immediately available to the public (Gertler 1992). Some preliminary results were first released by the federal government in March 1991 (USFWS 1991). The Trustee Council in its Oil Spill Restoration Framework and 1992 Draft Work Plan included a more complete summary of damage assessment study findings in April 1992. In early 1993, the Alaska Department of Fish and Game published overviews of some of the scientific studies and their findings in its magazine, *Alaska's Wildlife* (ADF&G 1993). In February 1993, the Trustee Council, the University of Alaska Sea Grant College Program, and the Alaska Chapter of the American Fisheries Society sponsored a four-day *Exxon Valdez* Oil Spill Symposium in Anchorage during which the results of many of the damage assessment projects were presented and discussed (EVOSTC 1993a, 1994; Rice et al. 1996).

The Exxon Corporation also conducted damage assessment studies. As with the government-funded projects, these were considered “litigation sensitive.” There was no coordination of the government and Exxon studies, and the results of the Exxon-funded research were not available for public review until 1993. Exxon scientists and contractors chose not to present their findings along with the government and other scientists in the Oil Spill Symposium in Anchorage in February 1993. Instead, the results of the Exxon studies were presented in April 1993 in Atlanta, Georgia, at the meeting of the American Society of Testing and Materials (Wells et al. 1995). For a critical review and comparison of the government-sponsored and Exxon-funded damage assessment studies, see Ott (1994).

No consensus has emerged regarding the extent and nature of the injuries to the natural environment caused by the EVOS, and many important studies were never funded or finalized. The original NRDA studies sponsored by the state and federal governments following EVOS focused on gathering information that could assist in building the litigation against Exxon. For this reason, studies that did not show promise of proving damage at a population level were abandoned early on. Two examples are shrimp and Dungeness crab, both of which were in decline in Prince William Sound before the oil spill. The Dungeness crab study never got off the ground, because researchers were not able to find enough individuals to allow them to draw any meaningful conclusions. Some species important to subsistence were not studied, because it was thought it would be difficult to assign a dollar value to any injuries. For example, while subsistence users reported a near total absence of octopus in the intertidal areas of Prince William Sound, there was no NRDA study of octopus. Observations of subsistence harvesters eventually led the EVOS Trustee Council to fund such a study in 1995. Some species that were probably injured have never been studied for oil spill effects. The most notable of these is the Dall porpoise. Subsistence users, commercial fishermen and recreation/tourism industry workers have all reported sharply reduced sightings of Dall porpoise since the spill.

While there have been a wide range of opinions expressed about the effects of the oil spill on natural resources and the state of recovery, most fall into one of the following four general points of view.

1) The State and Federal Governments as Represented by the EVOS Trustee Council

According to the Trustee Council, the ecosystem was damaged by the oil spill, and is recovering slowly. The goal of restoration is to help return the system to its precise pre-spill state. These efforts are hampered by lack of a pre-spill baseline for many species. In lieu of this, comparisons are made between oiled and unoiled areas, using the unoiled areas as a model for pre-spill conditions. (See below for more discussion of the Restoration Process and see Wiens [1996] and Holloway [1996] for critical reviews of the EVOS Trustee Council science program.)

2) Industry, as Represented by Exxon

From this viewpoint, the oil did no real damage, and may even have provided additional food to the ecosystem. Exxon contends that the observed declines are natural fluctuations in resource populations. Exxon studies found no declines in resource species. It has been alleged that Exxon researchers focused on the prime habitat areas for the species it studied, thereby skewing results. One report to Exxon shareholders proudly proclaimed that a study had found "none of the species normally present were missing" (Matthews 1990:7). Exxon asserts that crude oil is a “natural product,” and was present in Prince William Sound (through natural seeps) before the spill. For a critique of Exxon’s studies and conclusions, see Ott (1994).

3) An Environmentalist Perspective, Expressed in Wheelwright, "Degrees of Disaster” (1994)

According to Wheelwright’s argument, the ecosystem was changed by the spill, but change is not necessarily “injury” or “damage,” nor is it necessarily “bad.” Prince William Sound probably will not return to the precise state it was in prior to the spill, nor should that be a goal for postspill restoration. Instead, the ecosystem itself will find a new equilibrium. The ecosystem is resilient and will come back from virtually anything humans do to it. It will change, but it will not be destroyed. Wheelwright also contends it would have been better to simply leave the oil alone and let nature take its course. For a critique of Wheelwright’s arguments, see Green and Peterson (1994).

The view that for restoration it is best to let nature take its course is also embraced by some environmental groups. While they portray the damage from the spill as nothing short of catastrophic devastation, they agree that only nature can heal it, and humans should leave it alone. Given that any restorative action is at best futile, and at worst damaging, certain environmental interests have opposed spending the settlement money on research or restoration. They see habitat protection as the only worthwhile use for the money. For example, a representative of the Alaska Center for the Environment wrote:

> The importance of habitat acquisition is clear. There is very little that we can do directly to “restore” the spill impacted ecosystem. Dr. Robert Spies, Chief Scientist for the Trustees, has publicly suggested that nature is doing the primary job of restoration. What we must do to facilitate the recovery of the environment, therefore, is protect the ecosystem from further negative impacts from activities such as logging and road building. . . Unless the Trustees embark immediately on an aggressive campaign to use the $500 million [in available civil settlement funds] primarily for acquisition of habitat on private parcels. . . the opportunity to leave a grand and lasting legacy in the wake of this environmental tragedy will be lost, and the Settlement will be a failure (Phipps 1992).

So far, habitat protection has meant either habitat acquisition -- mostly the purchase of Alaska Native owned lands, which are then returned to state and federal government ownership and management – or acquisition of easements and other development rights to these lands (see below).

4) Alaska Natives of the Spill Region, as Expressed by Respondents to ADF&G Social Effects Surveys and in Testimony to the EVOS Trustee Council

For many Alaska Natives, the spill caused profound changes to the environment, many of them stark and clear. Many also suspected that the environment had changed in ways that cannot be seen or detected in laboratory tests. This view of continuing injury had profound effects on the outlook for the future that people expressed in a number of communities, and remained an important long-term impact of the spill (see Chapter Seven and Chapter Eight). Consequently, some Alaska Native subsistence users remained concerned over the possible long-term health effects of using resources contaminated by oil. There was a loss of confidence on the part of subsistence hunters and fishermen in their own abilities to determine if traditional foods were safe to eat. Residents of a number of impacted communities expressed the fear that animals that came into contact with the oil were altered in ways not detected by western science. In addition, people reported the scarcity of some resources, and observed abnormalities in resource species. There is a cultural proscription among the Alutiiq against the harvesting or eating of animals that appear sick or abnormal. In sum, a view persisted in the Prince William Sound communities, and to a lesser extent in the other communities in the oil spill impact area, that the natural environment had changed in ways that still posed a potential threat to their health and their way of life.

The Official List of Injured Resources and Services

In its 1994 Restoration Plan, the EVOS Trustee Council classified injured natural resource populations in four categories: recovered, recovering, not recovered, and recovery unknown (Table VI-3). The Plan also listed four "lost or reduced natural resource services," including subsistence. The Trustee Council periodically updates this list, taking into account the results of the restoration program.

In March 1999, ten years after the EVOS, the Trustee Council added river otters to the "recovered" category (for a total of two recovered resources (Table VI-4). Upgraded from the "not recovered category" to the "recovering" category were marbled murrlets, Pacific herring, and sea otters. Black oysercatchers and clams moved from "recovery unknown" to "recovering." The common loon was listed as "not recovering" rather than "recovery unknown." Also in March 1999, all human services (humans uses) were described as "recovering" but not fully recovered (EVOSTC 1999:10).

Table VI-3. Resources and Services Injured by the *Exxon Valdez* Oil Spill, 1996

Injured Resources				Lost or Reduced Services
Recovered	Recovering	Not Recovered	Recovery Unknown	
Bald eagle	Archaeological resources	Cormorants (3 species)	Black oystercatcher	Commercial fishing
	Common murre	Harbor seal	Clams	Passive uses
	Intertidal communities	Harlequin duck	Common loon	Recreation and Tourism (including sport fishing, sport hunting, and other recreational uses)
	Mussels	Killer whale (AB pod)	Cutthroat trout	Subsistence
	Pink Salmon	Marbled murrelet	Designated wilderness areas	
	Sediments	Pacific herring	Dolly Varden	
	Sockeye salmon	Pigeon guillemot	Kittlitz's murrelet	
	Subtidal communities	Sea otter (in oiled w. PWS)	River otter	
			Rockfish	

Source: EVOSTC 1996a:23

Table VI-4. Resources and Services Injured by the *Exxon Valdez* Oil Spill, 1999

Injured Resources[1]				Lost or Reduced Services[2]
Recovered	Recovering	Not Recovered	Recovery Unknown	
Bald eagle	Archaeological resources	**Common loon**	Cutthroat trout	Commercial fishing
River otter	**Black oystercatcher**	Cormorants (3 species)	Designated wilderness areas	Passive uses
	Clams	Harbor seal	Dolly Varden	Recreation and Tourism (including sport fishing, sport hunting, and other recreational uses)
	Common murre	Harlequin duck	Kittlitz's murrelet	Subsistence
	Intertidal communities	Killer whale (AB pod)	Rockfish	
	Marbled murrelet	Pigeon guillemot		
	Mussels			
	Pacific herring			
	Pink Salmon			
	Sea otter			
	Sediments			
	Sockeye salmon			
	Subtidal communities			

[1] Resources in bold indicates change in status

[2] Human services are considered "recovering" until the resources they depend on are fully recovered.

Source: EVOSTC 1999:13

MANAGEMENT RESPONSES TO THE OIL SPILL

Resource management agency responses to the oil spill are perceived by many to have added to the sense of injury, disruption, and uncertainty. Agency responses are very much part of the context that informed public assessments of the immediate and lasting effects of the oil spill.

Effects on Commercial Fisheries: Prince William Sound Finfish[4]

The first commercial fisheries to be affected by the *Exxon Valdez* oil spill were the spring herring fisheries of Prince William Sound. On April 3, the ADF&G announced that the PWS spring herring seasons, including the spawn-on-kelp fishery, would not open. Among the factors taken into consideration were the oiling of major herring spawning areas such as the Naked Island group, Green Island, and Montague Island. At the time, considerable oil remained in the sound, making additional impacts on these and other beaches likely. Schools of herring returning to other portions of PWS such as Valdez Arm and Tatitlek Narrows were observed near the grounded tanker itself or near oil sheens. Evidence suggested that exposure of herring, herring eggs, and herring larvae to crude oil could result in mortalities, morphological abnormalities, and genetic defects (Rice et al. 1987, as cited in Brady et al. 1991:5). Consequently, "taking into account all the potential effects to Prince William Sound herring stocks, it was the conclusion of the Department [of Fish and Game] that a harvestable surplus could not be demonstrated for any of the spring herring fisheries" (Brady et al. 1991:4-5).

In 1989, the other commercial fisheries in the Prince William Sound Management Area and other areas were conducted in accordance with a memorandum of understanding (MOU) between ADF&G and the Alaska Department of Environmental Conservation (DEC). The MOU was developed in collaboration with fishermen and processors to reduce the likelihood of fishing gear and fish being fouled by oil and to prevent oil-adulterated fish from being delivered to processors (Brady et al. 1991:6-7). In part, the MOU (Brady et al. 1991:47-53) stated that:

> A fishing area will remain closed if there is an indication of oil in any quantity in the area or the proximity of the area (including beaches), such that there is an appreciable likelihood that gear will be fouled, fish harvest adulterated, or such that the conduct of an orderly fishery could not take place.

Consequently, ADF&G conducted test fisheries before allowing openings in each management district. DEC inspected catches from the test fisheries for signs of oil. If oil contamination of fish or gear was

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4 For an overview of effects of the spill on commercial fisheries, see Piper (1993:99-106). See also the draft *Exxon Valdez* Oil Spill Restoration Plan for a summary table depicting commercial fisheries closures in 1989 (EVOSTC 1993b:B-27 to B-29).

deemed likely to occur, these areas remained closed to commercial fishing. This procedure generally became known as the “zero tolerance policy” (Piper 1993:99-106).

On June 14, a revised management outlook issued by ADF&G announced that, consistent with the MOU, commercial salmon fishing in the Eshamy District (which had already been closed since May 19 due to the presence of oil), the Southwestern District, and the Montague District would be closed for the remainder of the 1989 season. Because of the major impacts to much of the shorelines in the latter two areas, and the continued presence of oil, sheen, and tar balls in PWS, "it was determined that through the course of the 1989 season continued oiling presented an appreciable likelihood that gear will be fouled or the fish harvest adulterated if fisheries were conducted in the Southwestern and Montague Districts" (Brady et al. 1991:7-8).

A pre-fishery evaluation took place in the Copper River and Bering River districts, to the east of the spill. Because these evaluations found that these districts were not impacted by oil, commercial fisheries proceeded as normal (Brady et al. 1991:9-10).

As noted above, due to the presence of oil, the Eshamy District was closed to commercial salmon fishing on May 19, 1989. The only part of the district generally open to commercial fishing that remained free of oil was a portion of Main Bay that was protected by oil booms to protect hatchery stocks. A limited commercial harvest of surplus chum salmon, utilizing a single purse seine, took place within this boomed-off area (Brady et al. 1991:17-18).

In the Coghill and Unakwik districts, test fisheries in mid-June detected no oil contamination. Subsequently, commercial openings for sockeye and chum salmon proceeded (Brady et al. 1991:15). Additional test fisheries conducted from June 15 to July 11 in the purse seine districts of Southeastern, Eastern, Northern, Coghill, Northwestern, and outside waters of the Montague district found no evidence of oil contamination. Commercial openings began in late June, although certain waters in the Northern District were closed to prevent fishing near oiled beaches on Naked and Perry islands. However, on July 28 and July 29, the department investigated reports of oil sheens and contaminated fishing gear in the Esther Subdistrict and at Payday Point in Unakwik Inlet. Consequently, on July 30, the open waters of the Unakwik Inlet were closed. An expanded seafood inspection program resulted for fisheries conducted in the rest of PWS. Delays in deliveries occurred and "the overall atmosphere among the fishing fleet at this time was one of distrust and anger stemming from the uncertainties that the oil spill had forced onto their livelihoods" (Brady et al. 1991:24). Efforts were increased to monitor water quality and detect sheens and tar balls. A total of 12 field-announced openings took place in August as surveillance by ADF&G and DEC continued. Although numerous reports of sheens were received, these were largely bilge oil and diesel from tenders and fishing boats. Generally, Unakwik Inlet, the Esther subdistrict, and the waters in-between were open to commercial fishing during this period (Brady et al. 1991:25-27).

Due to the presence of oil spilled from the *Exxon Valdez*, commercial fishing for bottomfish and smelt in the PWS Management Area was closed by emergency order on April 30, 1989. Bottomfish includes any marine fish except halibut, osmerids, herring, and salmonids (5 AAC 39.975[21]). The commercial sablefish (black cod) fishery in this area had been closed before its scheduled opening date of April 1 (ADF&G 1989b).

A statewide 24-hour halibut opening occurred on May 15, in Areas 2C, 3A, 3B, 4A, and 4B, including Prince William Sound. A longline survey found that the major halibut fishing grounds were free of oil. Halibut caught and tested as part of this survey, including fish taken in PWS, were determined to be uncontaminated. Nevertheless, fishermen were urged to use caution due to the presence of patches of oil. An intensive program to monitor the fishing areas and to inspect the catch was developed (U.S. Department of Commerce 1989; Varanasi 1989). No problems with oil contamination were encountered during this fishery (ADF&G 1989a:21).

Effects on Commercial Fisheries: Cook Inlet Finfish

With the exception of one minor opening in Chinitna Bay, the Cook Inlet draft gillnet commercial salmon fishery, the second-largest sockeye salmon fishery in Alaska after Bristol Bay, was closed in 1989 due to the EVOS. As noted by the area biologist, “For the first time in thirty years, the Upper Cook Inlet salmon fishery was conducted without the presence of a drift gill net fleet” (Ruesch 1990:3; see also EVOSTC 1993a:B-28). As described by Piper (1993:102),

> As oil streamed out of Prince William Sound and splattered the outer Kenai coast, tar balls, debris, and weathered oil swung up with the prevailing currents and were sucked into the tiderips of Cook Inlet. The oil was hard to locate and hard to track in the silty, swirling waters whose tides flood to 25 to 30 feet, and whose currents run as fast as many rivers.

Mousse and other oiled debris tended to concentrate in the tidal rips, which are the most important harvest areas for the drift gillnet fleet. EVOS oil had much less impact on the Upper Cook Inlet set gillnet fishery, with a single period closure due to the presence of oil patties on the beach from Cohoe to Clam Gulch in July (Ruesch 1990:3).

There were numerous commercial finfish closures in the Lower Cook Inlet Management Area in 1989 due to the presence of oil. These included groundfish, smelt, herring, and pink salmon (Schroeder and Morrison 1990; EVOSTC 1993a:B-28). The small fish processing plant in Port Graham, owned by the village Native corporation, shut down in 1989 because of these commercial closures (Piper 1993:102).

Effects on Commercial Fisheries: Kodiak Finfish

In the Kodiak Management Area, 34 of 56 management units were closed for the duration of the 1989 herring sac roe fishing season due to the presence of oil from the EVOS. Commercial salmon fishing was almost entirely eliminated. Initially, the opening date was postponed from June 9 to June 19, but then only the setnet fishery in the Alitak District was opened. This fishery operated for 114 days. The only other commercial salmon opening in the Kodiak Area in 1989 was a two-day seine opening in Karluk Lagoon in mid-September (EVOSTC 1993b:B-29; Piper 1993:105). As noted by Piper (1993:105),

> While Prince William Sound fisheries managers had to cope with an ocean of oil, in Kodiak the problem was smaller in volume but almost more difficult to deal with. The oil came in large slugs and isolated windrows; it hit some places hard while leaving other neighboring areas alone; the concept of micromanaging fisheries cove by cove was therefore even tougher to handle. Further, long distances, open ocean shorelines, and bad weather made any prospect of tight oil-fisheries management a logistical challenge and a question of safety.

Effects on Commercial Fisheries: Chignik Area Finfish

In accordance with the MOU with DEC, ADF&G developed an oil spill monitoring program for the Chignik Management Area that operated between June 11 and September 22, 1989 (Barrett and Monkiewicz 1989). In addition, ADEC staff maintained a fish inspection facility at Chignik Bay.

In the Chignik Management Area, the sockeye salmon commercial fishery opened on June 12, but in conformance with the MOU, portions of the management area remained closed because of oil contaminated waters and beaches near Kilokak rocks, about 75 miles northeast of Chignik Bay. Further observations of oil and sheen caused a closure of most of the management area except the western portion of the Chignik Bay District. On June 26, mousse was observed within Chignik Bay. Consequently, the commercial fishery was closed. When opened again by emergency order on June 30, the commercial fishery was restricted to Chignik Lagoon. With the exception of Anchorage Bay, which was open to commercial fishing for periods beginning on August 9, the remainder of the Chignik Bay District, as well as the other districts in the Chignik Management Area (Eastern, Central, Western, and Perryville) were closed to commercial salmon fishing for the rest of 1989 "due to the close proximity of oil contaminated waters or beaches" (Thompson and Fox 1990:7-11, 156-169). In the open areas, commercial fishing was restricted to hours of daylight only, rather than the usual 24 hour openings.

On June 26, ADF&G received a report from the Columbia Ward Fisheries (CWF) of a delivery of oil contaminated fish to a tender in Chignik Lagoon. ADF&G determined that the deck and net of a fishing vessel were contaminated "with a petroleum product" and there was "a very strong odor associated with the contamination" (Thompson and Fox 1990:162). Both vessels were directed to report to the ADEC for inspection. After ADF&G detected a heavy sheen within the lagoon, the commercial period scheduled for July 27 was canceled. Although the lagoon was reopened on August 2, another emergency closure occurred on August 5 when "oil contamination in the form of mousse" was detected within Chignik

Lagoon. According to the emergency order, "the presence of mousse in waters traditionally fished by local lagoon fishermen indicates that there is an appreciable likelihood of contaminating gear or product" (Thompson and Fox 1990:163). Additional closures of scheduled fishing periods in the lagoon occurred in August. Openings occurred in early August "to prevent potentially damaging over-escapement levels of sockeye salmon" (Thompson and Fox 1990:10). Again, on August 16, the fishery was closed when a minimum of 30 fresh mousse patties were detected on the ocean spit (Thompson and Fox 1990:166). Commercial openings in the lagoon began again on August 19 and continued until the end of September (Thompson and Fox 1990:11, 167-169).

Most of the pink and chum salmon in the Chignik Management Area are harvested in the Eastern, Central, Western, and Perryville districts. Because of oil contamination in these districts, they were closed in 1989 and consequently, commercial harvests of these species were extremely low (Thompson and Fox 1990:13). Commercial fishing for coho salmon was also confined to the Chignik Bay District, which generally produces the largest harvests of this species in the management area. Harvests of cohos were also below average in 1989 (Thompson and Fox 1990:15-16).

Overall, 1.26 million salmon were harvested in the Chignik Management Area in 1989, less than one-half of the 1980-88 average of 2.85 million fish. For the most part, this was due to the curtailment of commercial chum and pink harvests due to the presence of oil. Consequently, the ex-vessel value of the 1989 harvest was about 24 percent below the 1980-88 average (Thompson and Fox 1990:2-3).

Effects on Commercial Shellfish

Several commercial shellfish fisheries in Prince William Sound were closed or interrupted in 1989 because of concerns about oil contamination due to the *Exxon Valdez* spill. These included brown king crab, pot shrimp (on April 3), and trawl shrimp. The commercial Dungeness crab fishery in the Northern District was also closed due to the presence of oil (Donaldson 1990:7,16,26,34). In addition, the ADF&G issued a news release stating that no permits for commercial fishing of miscellaneous shellfish would be issued "until the oil danger has passed and fishing for these species is justified" (ADF&G 1989c). In Lower Cook Inlet, there were closures to the shrimp and miscellaneous shellfish fisheries (EVOSTC 1993b:B-28).

Effects on Subsistence Fisheries

In the PWS Management Area, regulations in effect in 1989 allowed the taking of herring spawn on kelp for subsistence purposes only during the open commercial herring spawn on kelp season (5 AAC 01.610[d]). As noted above, the commercial season was closed in 1989 due to oil spill concerns. Consequently, the subsistence fishery remained closed as well.

On May 9, 1989, ADF&G received two requests for emergency regulatory changes to the subsistence salmon fishing regulations of PWS. The first, from The North Pacific Rim, the regional Native non-profit organization, asked that several portions of the Southwestern District that had been boomed off or were otherwise free of oiling be opened to subsistence fishing. These areas, including Jack Pot Bay and Eshamy Bay, were normally closed to commercial and subsistence fishing to protect milling salmon. Second, the letter asked that villagers from Tatitlek be allowed to fish with 150 fathoms of gill net gear in the Copper River Flats District to allow efficient harvesting of salmon in an area unaffected by the spill (Vining 1989). Normally, subsistence gear was limited to 50 fathoms in this area and seasonal limits were only 15 fish for a one-person household and 30 fish for a two-person household, with 10 fish for each additional household member (5 AAC 01.645[b]; Stratton 1992:49). The village of Tatitlek also asked that the Copper River Flats be open to special regulations because,

> Normally, Tatitlek residents harvest red, pink and dog salmon off of the tip of Bligh Island. However, now that this area is contaminated with oil, we desperately need an alternative option (Kompkoff 1989a).

In response, ADF&G took two emergency actions. The first, an emergency order (ADF&G 1989d), opened Eshamy Lagoon, Jackpot Bay Lagoon, Sawmill Bay, and Crab Bay to subsistence salmon fishing as of June 6. At the same time, the remainder of the Southwest District and Green Island were closed to subsistence fishing through September 30 "due to oiling of beaches, the risk of harvesting adulterated subsistence fish, and possible gear fouling." Citing substantial oiling of the beaches in the areas normally fished by residents of Chenega Bay, the emergency order stated that,

> Conduct of normal subsistence salmon harvests in waters adjacent to oiled beaches, or with oil on the surface is likely to result in adulterated product. . . The oiling of beaches in the Southwest District and Green Island have resulted in a loss of subsistence fishing opportunities in the traditional subsistence fishing areas and the opening of alternative harvest areas is justified. The alternative areas opened to harvest, namely Eshamy Lagoon, Jackpot Bay lagoon, and Sawmill and Crab Bays have not been oiled and are safe for the taking of salmon for subsistence use (ADF&G 1989d).

The second emergency action involved a finding of emergency and adoption of an emergency regulation (ADF&G 1989e). These enabled residents of Tatitlek and Ellamar to use nets up to 150 fathoms in length in the Copper River District and to pool their household seasonal limits. In part, the justification for this finding of emergency stated that,

> Normal subsistence activities by the communities of Tatitlek and Ellamar in Prince William Sound have been seriously disrupted since the *Exxon Valdez* oil spill. For the last two months, residents have foregone harvest of most of their usual subsistence foods, including herring, herring spawn on kelp, clams, halibut, and seals due to their concerns about possible oil contamination of these resources (ADF&G 1989e).

There were no subsistence fishing regulatory actions in the other management areas. ADF&G considered a subsistence fishery closure for the Kodiak Management Area. However, managers rejected this action for several reasons. First, because of the patchy nature of the presence of EVOS oil around the Kodiak Archipelago, subsistence fishermen had the flexibility to shift their harvest efforts to clean areas. Second, subsistence fishermen were generally using smaller gear than is involved in the commercial fishery, allowing for more control and monitoring should oil be encountered. Third, it was known that some people were subsistence fishing and it was felt that this opportunity should not be taken away from those who chose to take advantage of it.

Effects on Hunting Opportunities

In 1989, no state hunting seasons were modified as a consequence of the oil spill,[5] although resource managers and resource users raised concerns about some wildlife populations. As stated above, deer are known to feed on kelp from beaches, and subsistence hunters raised concerns about the possibility that the meat might become contaminated as a consequence. There was also concern on the part of resource managers about mortality to the deer themselves from contact with the oil.

> Sitka black-tailed deer in the area traditionally winter on the forest beach fringe and are likely to ingest oiled kelp. It is known from studies of domestic cattle that cattle will ingest oil-contaminated food and die from toxic effects (ADF&G 1989a:30).

On July 27, the ADF&G issued a news bulletin that announced that deer seasons would open as normal in GMU 6 (Prince William Sound) on August 1. Quoting the state epidemiologist, the announcement stated, "Human health risks related to the oil spill from ingesting deer meat are negligible."[6] The announcement also noted that deep snow and high deer populations had caused significant winter deer mortality, and added, "People may choose to avoid hunting in the most heavily oiled areas of the spill." Named specifically were Naked, Knight, Eleanor, Ingot, Disc, Latouche, Elrington, and Evans islands (ADF&G 1989f). These were the major hunting areas of the people of Chenega Bay (Stratton and Chisum 1986:79) and some (such as Naked and Eleanor islands) were used by Tatitlek hunters as well (ADF&G 1990a).

In one of the first publications on the oil spill and its potential impacts, the ADF&G (1989a) expressed similar concerns about oil-induced mortalities and contamination regarding bears.

> Black bear in the Prince William Sound area and the Kenai Peninsula and brown bear on the Alaska Peninsula are opportunistic feeders. When they emerge from winter denning, they will eat beach grasses and sedge, which might be contaminated with oil. They will also dig for clams in the intertidal area and will scavenge for birds. Canadian studies have shown that the toxic effects of crude oil can kill polar bears (ADF&G 1989a:30).

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5 In August, 1991, the ADF&G, by emergency order, delayed the opening of the harlequin duck season in GMU 6 (Prince William Sound) for one month (opening October 1 instead of September 1). Reasons for the postponement included a significant failure of harlequin ducks of the western sound to reproduce, a marked reduction in harlequin duck numbers compared to historic levels, and the poor body condition of harlequins which had wintered in the western sound (ADF&G 1991a). Potential causes of the reproductive failure included oil exposure from contaminated intertidal foods such as blue mussels, and human disturbance during oil spill cleanup activities (Patten 1993:153).

6 It should be noted that no specific information about deer harvested in the oil spill area and possible contamination was available in the summer of 1989. As discussed below, the first results of tests on deer muscle and liver samples for oil contamination were not released until June 1990.

On April 24, 1989, the ADF&G issued a "Prince William Sound Black Bear Hunter Advisory" (ADF&G 1989g). The bulletin suggested that black bear hunters might consider hunting areas other than western PWS, in part because the large numbers of people and activities connected with the oil spill cleanup "will make bear hunting less enjoyable and much more difficult." Another reason cited by the ADF&G for not hunting bears in this part of PWS was that "there is a concern that black bears will ingest oil, harming themselves or affecting the palatability of the bear meat."[7] The advisory stated that biologists would investigate the effects of the oil on bears, including "whether their meat will be tainted" and communicate the findings to the public when they became available. However, as noted above, no studies of the effects of the spill on black bears were done.[8]

SUBSISTENCE FOOD CONTAMINATION AND FOOD SAFETY[9]

The residents of Tatitlek, the community closest to Bligh Reef, first learned about the *Exxon Valdez* oil spill on the morning of March 24 during a network newscast from New York City (Alaska Oil Spill Commission 1990:70). The next day, they were startled to see clouds of dark smoke rising from the other side of Bligh Island, the result of a test burn about which they had not been informed (Davidson 1990:283). For the people of Tatitlek, one of the first signs that something terrible and extremely unsettling might be happening to the fish and wildlife of Prince William Sound as a result of the spill was a report of a dead starfish that washed up on the beach near the village. Starfish are not eaten, but they, like other creatures, may act as signs of unseen danger. At Chenega Bay in June 1989, elders observed gray cod pooling up in shallow water at the boat harbor. The only other time they could recall such odd behavior was on Good Friday, 1964, the day a tidal wave destroyed their village and killed one-third of its population. This, too, they believed, was a sign of danger. As the effects of the spill spread, reports and sightings of dead and dying birds, sea otters, and other wildlife were commonplace. As the residents of the villages in the path of the oil traveled to traditional harvest areas or worked on the spill cleanup, they witnessed these damages first-hand. This led to many uncertainties and questions about the effects of the oil.

As noted above, the effects of the spill were discontinuous; some beaches were heavily oiled, others were not. Some animals, such as sea otters and sea ducks, were very vulnerable to oiling. On the other hand, salmon and deer showed no outer signs of exposure to oil. They did not appear to be dying, but were they safe to use? Were there linkages between the injuries that villagers observed and what

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[7] It is important to note that subsistence hunters from Chenega Bay and Tatitlek did not have any practical alternatives to hunting in the sound, because of economic and cultural reasons.

[8] Studies of coastal brown bears from the Katmai National Park (Alaska Peninsula) found evidence of the death of one yearling from ingesting oil; of a sample of 27 bears, four (15 percent) showed elevated hydrocarbon levels in their blood or bile. The study concluded that exposure to oil was not great in this population and survival of bears was not greatly affected by the spill (Lewis 1993b:8-9).

[9] An earlier version of much of this section appeared in Fall (1991b). The subsistence foods testing program is also discussed by Walker and Field (1991), Fall (1993), and Fall and Field (1996). The most comprehensive review appears in Field et al (1999).

they could not see? Further, if resources had been only moderately contaminated, what might be the long-term health effects for those people who use large quantities of such foods?

Thus, the major questions that subsistence harvesters raised following the spill became: Are subsistence foods harvested in the oil spill area safe to eat? If some beaches, waters, and animals were oiled and clearly inedible, were any safe to use? If there were no immediate effects of eating resources with very low levels of contamination, what might the health risks be for communities that use very large quantities of these foods every year? As a Chenega Bay resident explained in April 1990,

> We saw too much oil, and we didn't want nothing to do with [fish]. I guess if you didn't see the oil you wouldn't mind. We don't want to eat them until we find out what's really going on.

Another person from this village succinctly stated the general concern by saying, “It feels like the environment is unclean right now.”

When the people in Tatitlek first raised the subsistence food safety issue, the DEC responded that the best way to know if foods are free from oil is to smell and taste them. This "organoleptic" test is the primary method used by DEC's laboratory in Palmer for checking the quality of commercial seafoods. A health bulletin issued by the Alaska Department of Health and Social Services on May 5, 1989 (ADHSS 1989a) contained similar advice. In part, the message read as follows:

> Great concern exists about the potential impact of the oil upon fish and other seafood. The best tests available at this time are the smell and taste of the fish. If the fish smell or taste of petroleum, they should not be eaten. If they don't, it is almost certainly safe to eat. It is probable that living clams, mussels, and shellfish from intertidal areas are also safe, if the same standards are applied. . . We are unable to provide absolute assurances at this time and are working to have better information as our highest priority.

Residents of the villages responded to this advice with skepticism and disbelief. It contradicted what they were seeing -- animals dying after exposure to oil in their traditional subsistence use areas. Subsistence harvests in Tatitlek, Chenega Bay, Nanwalek (English Bay), Port Graham and Ouzinkie, virtually came to an end soon after the spill. And in every Alaska Native village as far as Perryville and Ivanof Bay, 500 miles away on the Alaska Peninsula, people noticed unusual behaviors in animals[10] or suspect conditions in some subsistence foods. Clearly, the oil spill had created conditions that were unfamiliar to the hunters and fishermen of these villages. They questioned their skills at understanding their environment and making informed decisions. Consequently, in many cases villagers discarded traditional foods or refrained from harvesting entirely for fear that the resources had been poisoned.

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[10] For example, hunters in Prince William Sound in 1989 noted unusual behaviors in harbor seals, such as certain animals not attempting to escape when hunted. The seals appeared sick and lethargic. It was later revealed (in 1991) that scientific studies found "debilitating lesions" in the brain tissues of many oiled harbor seals. As a result of exposure to aromatic hydrocarbons, nerve axons had swelled and degenerated, interfering with nerve transmissions. Such brain damage made it difficult for seals to perform such everyday behaviors as swimming, diving, feeding, and fleeing predators (including people). The researchers concluded that this "explains the unusual behavior of seals immediately after the spill. . . ." (Lowry and Frost 1993:20).

When the subsistence harvests stopped, pleas for assistance began. Spring is a particularly critical time for subsistence harvests in Tatitlek and Chenega Bay. Supplies of foods prepared the year before become scarce, and cash is in short supply. Normally, harvests of herring spawn on kelp, birds, marine mammals, and fish replenish stores of food in April. But normal harvests did not occur in 1989 and a potential shortage of subsistence foods was at hand. For example, Tatitlek contacted Alaska Native groups in Southeast Alaska. They said that because of concerns about the safety of subsistence resources and disruptions in normal work patterns caused by the spill, subsistence foods were in short supply. In the message, the village leaders (Tatitlek 1989) wrote:

> We have dead starfish, mussels, and shellfish under our community dock in the same vicinity as the herring spawn is taking place. . . Please help us. . . We need seal, sea lion, octopus, herring (spawn and roe), halibut, cockles, clams, bidarka [chitons], ducks, red snapper, shrimp, crab, and deer.

Subsequently, in programs in part facilitated by Exxon, supplies of subsistence foods were shipped to both villages from several other Alaska Native communities (see below).

The villages were not alone in raising questions about the immediate and long-term health effects of using subsistence foods from the oil spill area. During a conference call organized by the federal Centers for Disease Control on April 11, 1989, the Indian Health Service raised various health-related issues. The Food and Drug Administration (FDA), the Agency for Toxic Substances and Disease Registry, the Alcohol, Drug Abuse, and Mental Health Administration, and the Alaska Department of Health and Social Services participated in the discussion. The summary of this conference on "Food Safety/Health Effects" of the oil spill (Centers for Disease Control 1989) stated that:

> The Alaskan Oil Spill has the potential for causing acute and chronic health effects. Potential human health impacts include those associated with exposure to contaminants through the food chain, stress associated with loss of lifestyle, and possible economic impact, and hazards associated with cleanup operations.

Regarding food safety, this group identified several issues, including:

> Potential bioaccumulation of oil contaminants in food sources consumed by humans, particularly subsistence populations, and possible short- and long-term affects (sic) of these contaminants. . . [And the] need for a determination of when harvesting of seafood can safely be resumed.

The group recommended the development of a "system involving both organoleptic and chemical analytical testing to ensure food safety."

Little specific information was readily available to respond to any of these questions. A literature search conducted by the National Oceanic and Atmospheric Administration (NOAA) (the chief scientific advisors to the U.S. Coast Guard's federal on-scene coordinator during the spill response), found that "no information base has been developed on human health effects resulting from the consumption of oil-contaminated seafood" (Walker and Field 1991:443). A major summary of data on oil spills by the National Research Council in 1985 (quoted in Walker and Field 1991:443) concluded that:

> At present, there is no demonstrated relationship that chronic exposures through eating petroleum-derived PAH (polynuclear aromatic hydrocarbons) contaminated seafood are related to the incidence of cancer or other diseases in humans.

However, the summary went on to qualify this statement as follows:

> Exceptions to these conclusions may arise in localized areas, as in the case of isolated fishing villages where seafood constitutes a major portion of the annual diet. No data are available, however, for these cases.

Of course, communities such as Tatitlek and Chenega Bay (and the other Alaska Native communities of the spill area), whose residents consume hundreds of pounds of marine resources annually, are clearly examples of such villages where, at the time of the oil spill, the long-term health effects of eating oil-contaminated food were unknown, according to the best information available.

Subsequently, the primary response to the issue of subsistence foods contamination was directed by the federal Indian Health Service (IHS), which formed an "Oil Spill Health Task Force" (OSHTF) (Nighswander 1999). This ad hoc group began meeting biweekly at the Alaska Native Medical Center in Anchorage within a month of the spill. In addition to IHS, regular participants in the OSHTF included the Division of Subsistence of ADF&G, the ADHSS, DEC, NOAA, Exxon, and two regional Native service organizations, the North Pacific Rim[11] for the Chugach villages ("the Rim") and the Kodiak Area Native Association (KANA). The OSHTF coordinated and reviewed research on subsistence foods safety, developed a consensus on health issues, and communicated the findings of the studies to the villages.

In 1989, two studies of fish and shellfish were designed to address the question of subsistence food safety after the oil spill (Field 1999). The first to get underway was a "pilot study" developed by the Division of Subsistence. The field portion of this project took place in May 1989. The second was funded by Exxon and took place under the terms of an MOU with NOAA from July to September 1989. In both projects, samples of fish and marine invertebrates were taken from important subsistence harvest areas after consultation with village experts and Native organizations. In combination, the studies covered sites in Prince William Sound, Lower Cook Inlet, and the Kodiak Island area. Sampling sites were selected primarily because of their value as subsistence harvest areas, and no attempt was made to chose a representative sample of oiled and unoiled locations. Village assistants were usually part of the sampling crews. Division researchers and NOAA personnel also participated in the Exxon-funded project.

The samples were tested for signs of oil contamination. The tests were designed to measure levels of polycyclic aromatic hydrocarbons (PAHs) in the bile and edible tissues of the samples. PAHs are among the toxic components of petroleum and some are known carcinogens. The FDA performed the

[11] This organization adopted a new name, "Chugachmiut," in 1992.

tests for the pilot study, and NOAA's Northwest Fisheries Center analyzed samples from the Exxon-funded project.

No results were available from these projects until late August 1989, when the FDA's findings from the pilot study were released (USFDA 1989, OSHTF 1989a, ADHSS 1989b,c). The FDA found that 10 "organoleptically clean" samples of fish and shellfish had no PAHs or very low levels as measured in parts per billion. According to the FDA, eating foods containing PAHs at those levels did not represent a health risk. But two samples of shellfish taken at Windy Bay, a heavily oiled site at the southwestern tip of the Kenai Peninsula used by the villages of Port Graham and Nanwalek and deemed oiled by local assistants in the field, had higher PAH values than usually found in areas not contaminated by oil. Insufficient tissue from these samples was available to perform the more detailed tests required for a health risk assessment.

As part of the second study, the Northwest Fisheries Center conducted 365 tests to measure the levels of PAHs in the bile and edible tissues of the samples (Varanasi et al. 1990, Brown et al. 1999, Hom et al. 1999). These tests were highly sensitive, measuring PAH levels down to less than one part per billion. The results of the first round of tests were available by late August, shortly after the results of the division's pilot study. At the request of the state epidemiologist, NOAA then assembled an "expert panel of toxicologists" which met in Seattle on September 14 to review the findings (OSHTF 1989b; ADHSS 1989c,d). The panel concluded that the levels of PAHs found in fish were low and of no health concern. Most shellfish tested were also safe, but some, such as those collected from the contaminated beaches at Windy Bay, had unacceptably high levels of oil contamination and were unsafe to eat. The expert committee concluded that shellfish "should not be collected from obviously oil-contaminated areas."

After receiving the panel's report, the OSHTF reviewed the findings and developed plans to inform the villages of the results. Meetings took place in 10 communities in PWS (Chenega Bay and Tatitlek), Lower Cook Inlet (Nanwalek and Port Graham), and the Kodiak Island Borough (Ouzinkie, Port Lions, Kodiak, Old Harbor, Larsen Bay, and Karluk) in September and October 1989. Due to poor weather, the OSHTF team could not get to Akhiok and the meeting there was canceled.

Also, the state's Section of Epidemiology reported these findings in a health bulletin issued on September 22, 1989 (ADHSS 1989c). In part, the bulletin advised the public that:

> Results of studies to date, combined with available scientific knowledge, provide powerful evidence that Alaskan finfish are and will continue to be safe to eat. Levels of aromatic hydrocarbons found to date in finfish are very low and are similar to levels in uncontaminated fish.
>
> Because only a small number of crustaceans (crabs) and mollusks (clams and mussels) have been tested, our recommendations about their safety are more tentative and cautious. Specimens of mollusks taken from heavily oil-contaminated beaches have shown high levels of aromatic hydrocarbons. Shellfish tested from "clean beaches" have shown the presence of aromatic hydrocarbons in higher concentrations than found in uncontaminated areas but at levels that do not represent a serious health hazard. If mollusks are consumed, they should not be collected from areas that are obviously contaminated with oil.

Findings from a second and third round of tests performed at the NOAA laboratory on samples collected in August and September were consistent with those of the first round of tests, according to the conclusions of a second meeting of the expert panel in February 1990 (OSHTF 1990a, 1990b; Varanasi et al. 1990.)

While information of this nature was released by government agencies, many questions remained unanswered in the spill area villages. These concerns surfaced, for example, during the community meetings in September and October 1989 (see above). Villagers asked why more samples had not been tested from more areas, and posed the question of how users could be sure that resources were safe based upon the limited number of samples and sites examined so far. Oil was still present in substantial quantities in some subsistence use areas. Conditions on a beach that tested clean could change with the next tide. Also, little or no information was then available about other resources, such as deer, bears, waterfowl, and marine mammals. Village residents pointed out that health bulletins and news releases often did not reach families in their communities. People were still uninformed of agency recommendations. Many were afraid. Another issue was that the FDA had established no guideline thresholds regarding what levels of PAHs were safe to consume. As noted by Walker and Field (1991:445), for many villagers, "any level of contamination was considered to be unsafe."[12] Some community representatives wondered why a subsistence foods testing project was being funded by Exxon rather than the state government, suggesting a conflict of interest (Kompkoff 1989b).

Some village residents expressed dissatisfaction over perceived inconsistencies in subsistence food safety advice (U.S. Coast Guard 1993:419; Nighswander 1999:35; Fall et al. 1999:247). For example, some believed that more concern was being directed towards commercial seafood contamination through the state's "zero tolerance policy" (see above) than towards subsistence fisheries. If commercial finfish fisheries had been closed because of the threat of contaminated fish, why were the villagers being told that finfish were safe to eat?[13]

Another source of distrust about the safety of subsistence foods had to do with perceived changes in health advice. As noted above, early health bulletins had recommended the organoleptic test as a reliable means of detecting oil contamination. However, in the community meetings in September and October 1989, differences between PAHs with low and high molecular weights were discussed. The team from the OSHTF explained that "light" (i.e., low molecular weight) PAHs can be detected by smell and taste. These PAHs may cause acute effects such as nausea if ingested. They are highly volatile, meaning that they weather relatively rapidly and disappear from the environment. The "heavy" (high molecular weight) PAHs are more persistent and largely undetectable by human senses. It was revealed

[12] At the request of the IHS, the FDA prepared an advisory opinion on the safety of subsistence foods from the spill area, which was available in August 1990 (U.S. Food and Drug Administration 1990). The report concluded that the risks associated with using finfish and shellfish from the spill area, including the oil-contaminated marine invertebrates that had been tested as part of the OSHTF project, were low. The Task Force continued to advise that subsistence users avoid using shellfish from oiled areas because while the risk of getting cancer from eating shellfish from these beaches was low, it was an avoidable risk.

that long-term exposure to these components of the oil could have chronic health effects, including cancer. Consequently, as the oil weathered and the light PAHs dissipated, the heavy PAHs would be left behind, rendering the organoleptic test no longer at all useful for detecting exposure to oil (ADF&G 1990b, 1990c). This meant that subsistence users would need to be aware of the oiling and cleanup status of particular beaches in order to be confident of the safety of using marine invertebrates. For some villagers, this additional information was contradictory to earlier advice, and cast doubt on the effort to provide them with reliable information. Reports in the news media at the time also suggested that health advice had "changed" (Hulen 1989).

Subsequently, both Exxon and the State (through the Division of Subsistence) continued sampling and testing programs in 1990. The Northwest Fisheries Center agreed to conduct the hydrocarbon analyses for both programs. The division added collection sites near Alaska Peninsula communities. Generally, the purpose of these programs was to monitor conditions near each village to assess whether the earlier health advice remained valid. Results from these studies became available during the spring and summer of 1990. Findings continued to be consistent with those of the previous summer. Tests were also run on samples of marine mammals, ducks, and deer. Results for some of the marine mammals were available by June 1990, and the remainder by October 1990. Although indications of exposure to oil were found for some samples, PAH levels were well below those considered to represent a health risk (ADF&G 1990b, 1990d, 1991b). These findings were released primarily through a series of newsletters and a video tape produced for the OSHTF by the Division of Subsistence (ADF&G 1990b). A limited sampling program took place in 1991 as well, which focused on sites that had previously produced samples with elevated hydrocarbon levels. [14]

In summary, in the year following the grounding of the *Exxon Valdez*, subsistence resource users, government agencies, and scientists raised questions about the potential effects of the oil on fish and wildlife and the consequent implications of these effects on the health of those people who consume these resources. Site-specific and resource-specific information to answer these questions was in short supply. In 1989, the first limited information available to subsistence harvesters to respond to questions about possible oil contamination of wild foods was released in late August. More complete results of the studies of fish and shellfish did not appear until February 1990, and test results concerning marine mammals, birds, and deer were not available until June 1990 or later. Findings from these studies, and the corresponding health advice, were consistent: most resources taken from the oil spill area were safe to eat, but people should avoid harvesting at contaminated areas and carefully inspect their harvests for signs of oil. But into the second year after the spill, household interviews found that many respondents still had doubts about the safety of subsistence foods (cf. Smythe 1990). In response, as noted above, the food-testing program continued in 1990 and 1991. In FFY 1993 through FFY 1995, the EVOSTC funded

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[13] As Piper (1993:107) notes, the commercial fisheries closures primarily had to do with concerns about oiling fishing gear, which could subsequently oil the catch itself.

[14] The detailed findings of these subsequent studies will not be discussed here. They are reviewed in detail in a final report prepared by the Northwest Fisheries Center (Varanasi et al. 1993) and in Field et al. (1999).

subsistence restoration projects to continue to provide information to subsistence users to address the long-term impacts of the spill. This included limited collection and testing of subsistence resources, including fish, marine invertebrates, ducks, and harbor seals. The study results were consistent with earlier findings (Miraglia 1995, Miraglia and Chartrand 1997, Shemet and Miraglia 1998).

In 1989, the prevailing uncertainties and fears about the safety of using subsistence foods from the oil spill area were based on a number of factors, as noted below.

- Thousands of miles of coastline, much of which had been used for subsistence harvesting, had been oiled.
- Deaths of marine mammals, birds, and other wildlife due to the direct effects of the oil were observed or reported.
- Unusual behaviors and other abnormalities in wildlife, which subsistence users suspected were caused by sub-lethal effects of exposure to oil, were observed or reported.
- Subsistence users were dubious that resources that exhibited no obvious signs of oiling through inspection, smell, or taste were free from hydrocarbon contamination and safe to eat.
- Local commercial fisheries were closed due to the concerns of resource managers that fish and fishing gear would be contaminated by oil.
- Advisory bulletins from state health officials advised caution in using seafood with obvious signs of oiling or that were taken from oiled areas.
- Advisory bulletins issued by ADF&G suggested that hunters might choose to avoid hunting deer and black bear in the Prince William Sound area due to the potential effects of oiling on these animals, their populations, and their habitats.
- Health officials provided no firm assurances that consuming resources from the spill area in the large quantities traditionally used in these communities would result in no adverse long-term health affects, because of the lack of government standards concerning the safe levels of hydrocarbons in foods.
- Health officials discussed potential effects of eating seafoods from the oil spill areas in terms of degrees of increased levels of risk. The view in the villages was that any increased level of risk to health was unacceptable. Before the spill, subsistence foods were viewed as safe and clean. After the spill, a risk had been added to what for village residents had been formerly an unquestionably reliable and safe source of food.
- No studies were provided in 1989 showing the potential long-term effects of exposure to low levels of hydrocarbons in foods in human populations heavily dependent upon seafoods.
- Specific laboratory findings about oil contamination levels in subsistence resources from traditional harvest areas in the spill area were not available until late summer and early fall of 1989.
- Laboratory tests provided limited coverage in terms of the number of samples tested, harvest areas sampled, and types of resources sampled.

- The involvement of Exxon in the foods sampling and testing program raised questions about potential conflicts of interest and the reliability of the findings and health advisories.
- The legal embargo on the results of scientific damage assessment projects, which were deemed "litigation sensitive," raised questions about whether subsistence users were being informed of the full picture of resource injuries and health risks.

These points were also stressed in an overview of "lessons learned" prepared by former members of the OSHTF ten years after the spill (Fall et al. 1999). In summing up the experiences of the OSHTF, participants stressed, among other things, the need to develop a risk communication process that builds trust and credibility (Nighswander and Peacock 1999). Further,

> From the perspective of risk communication, two key themes stand out. The first is the importance of a collaborative, multidisciplinary approach from the earliest stages of response. The second is the necessity of an effective, interactive communication process that develops a credible message and delivers it well and is flexible and reflexive enough to adapt as its audience responds. Crosscutting both of these themes is the importance of sound science, local knowledge and observations, a public process above suspicion, and sensitivity to the cultural context in which the issues are defined and the message is received. These lessons must be applied to each stage of the process, from contingency planning, to spill response, to long-term restoration (Fall et al. 1999:267).

In retrospect, the former chairman of the OSHTF (Nighswander 1999:49) noted that:

> For state and federal agencies, nonprofit groups, and private industry with vested interests in the safety of the subsistence food and the commercial values of seafood in general, the favorable food analyses were a relief. This information was also reassuring to many villagers. But for the outspoken few and the many with lingering doubts, only time will tell. Perhaps only when the environment looks safe to them, and the beaches, birds and fish appear as they did before the spill, will they conclude that their food is safe to eat.

The persistence of concerns about subsistence food safety and the effects of these concerns on subsistence uses are discussed in Chapter Seven.

EMERGENCY FOOD PROGRAMS

<u>Wild Resources: Prince William Sound</u>

Soon after the spill, several emergency food relief programs developed to try to supply residents of certain oil spill communities with subsistence foods. Table VI-5 reports the percentage of households in 10 Alaska Native villages that received emergency foods. (These programs did not operate on the Alaska Peninsula.) The first program began in May at Tyonek, a Dena'ina Athabaskan Indian community on the western shore of upper Cook Inlet. The people of Tyonek volunteered to provide king salmon from their subsistence harvests to Nanwalek (English Bay), Port Graham, Chenega Bay, and Tatitlek. The Russian Orthodox Church facilitated this program, and funds for supplies and transportation were provided by the

Alaska Department of Community and Regional Affairs and Exxon (Ramage 1989, Taylor 1991). According to a summary provided by Exxon (Taylor 1991), approximately 7,000 pounds of king salmon from Tyonek's subsistence harvest were sent to the four communities. According to division survey results, 88.8 percent of Chenega Bay households and 77.2 percent in Tatitlek received chinook salmon through this program, and the estimated total received and kept was about 2,550 pounds (Fall et al. 1996:122-123).

A second offer of assistance came from the Southeast Alaska community of Angoon, the majority of whose residents are Tlingit Indians. The City of Angoon had received a Summer Youth Employment Grant from the Alaska Department of Community and Regional Affairs to help the young people of the community to learn subsistence harvesting and processing skills. The program operated from June through August 1989. The community offered to share some of the harvests from this program with families in oil spill-impacted communities. As with the Tyonek program, Exxon provided funds for supplies and for shipping the foods to Nanwalek, Port Graham, Chenega Bay, and Tatitlek (Adams 1989). Exxon estimated that 16,000 pounds of halibut, seaweed, harbor seal, and deer were distributed as part of this program (Taylor 1991). Eleven percent of households in Chenega Bay and 40.9 percent in Tatitlek reported that they received and kept foods through the Angoon program. The estimated total received from Angoon was 95 pounds for Chenega Bay and Tatitlek combined. This estimate does not include halibut, for which respondents were unable to provide estimates (Fall et al. 1996:122-123).

Chugach Alaska Corporation, the regional Native corporation, through its Chugach Fisheries fish processing facility in Cordova, initiated a third program. Again with financial assistance from Exxon, 40,000 pounds of sockeye, chum, and coho salmon harvested from the Copper River District (which was outside the spill area) reportedly were distributed to the villages of Tatitlek, Chenega Bay, Nanwalek, and Port Graham (Ramage 1989, Taylor 1991). According to survey results, most households in Chenega Bay (83.3 percent) and Tatitlek (86.3 percent) received salmon through this program. By their report, an estimated total of about 4,200 pounds of fish was received and kept in the two communities (Table 40). There was some dissatisfaction among Tatitlek households about the distribution of the Copper River salmon, with some households reporting that they did not receive a fair share while other households had been “greedy” and taken more than they needed.

A fourth food-sharing program was organized by the Eyak Village Council in Cordova. This program provided king salmon heads donated from local fish processors; 16.6 percent of households in Chenega Bay and 27.2 percent in Tatitlek reported receiving the product through this program (Fall et al. 1996:122-123).

Table VI-5. Participation in Emergency Food Relief Programs, Alaska Native Communities of the EVOS Region, 1989[1]

Community[2]	Percentage of Households Receiving Any Wild Food	Mean Pounds Received per HH	Total Pounds Received, Community
Chenega Bay	94.4%	110.2	2,315
Tatitlek	90.9%	176.6	4,945
Nanwalek	91.2%	80.8	3,153
Port Graham	93.8%	132.4	8,078
Akhiok	100.0%	70.6	918
Karluk	97.0%	285.5	11,704
Larsen Bay	100.0%	77.1	1,312
Old Harbor	93.8%	60.6	5,635
Ouzinkie	80.0%	76.7	5,291
Port Lions	91.7%	61.8	4,141

[1] Includes wild foods only. Totals include amounts housesholds reported they received and kept.
[2] Alaska Peninsula villages were not included in any emergency food programs.
Chenega Bay had 13, Tatitlek 19, Nanwalek 5, and Port Graham 25 instances where the pounds of a resource received were not available. Numbers presented therefore represent minimums.

Source: Alaska Department of Fish and Game, Division of Subsistence Household Surveys, 1990.

In summary, most households in Chenega Bay (94.4 percent) and Tatitlek (90.9 percent) received some subsistence foods in 1989 as part of the emergency food relief programs (Fall et al. 1996:122-123). On average, Chenega Bay households reported that they received and kept about 105 pounds of subsistence foods from food relief programs. Most of this was chum, coho, and sockeye salmon received through the Chugach Fisheries program, and king salmon received from Tyonek. Smaller amounts of king salmon were received from the Eyak program, and halibut and harbor seal were received from Angoon.

There are marked differences between estimates of the amount of food shipped through food relief programs and the amounts reported as actually used by Chenega Bay and Tatitlek households. An incident occurring in October 1989 cast doubt on the safety of using the foods and led to households' discarding imported subsistence foods. While in Chenega Bay, one of the co-authors of this report learned that about two days earlier, a boat from Valdez had unloaded boxes of seafood on the dock, including pollock, Dungeness crab, razor clams, and shrimp. Believing this to be another shipment of food from Exxon, several village residents removed seafood from the boxes, and then distributed it to others.

Several people reported having discarded the crab and clams they had received from this shipment, saying the food did not appear usable. The crab had been frozen raw. When the ADF&G researcher inspected the shipping boxes, she noted that they were marked with the warning “Not for human consumption.” One of the Chenega Bay men accompanying her stated that he had heard that sea otters at the rescue center in Valdez were being fed uncooked crab. Upon learning that a similar shipment had arrived at Tatitlek, a Chenega Bay village council member called the Tatitlek council president to warn him about the crab. The few people interviewed in Chenega Bay who had eaten the crab did not report getting sick. Upon phoning the seafood company, which had packaged the shipment, the division researcher confirmed that the crab had been special ordered by Exxon to feed sea otters at the Valdez rescue center.

When interviewed later in the month by the same researcher, some people in Tatitlek reported that they had become ill from eating food from the similar shipment sent to their village. As in Chenega Bay, few people had seen the boxes with the warning because the food had been divided among households almost as soon as it arrived. Symptoms reported after eating the crab and pollock included diarrhea, nausea, headaches, and a rash. In late October, the Tatitlek council president tried to contact Exxon about his concern that people were getting ill from eating foods from these shipments, but got no replies. He reported the following to the Oil Spill Heath Task Force:

> . . . [D]uring the second week of October, a shipment of seafoods was sent to Tatitlek by Exxon. In this shipment were various amounts of geoduck, prawns, Dungeness crab, pollock and razor clams. After the food was distributed, and some of it eaten, it was noticed that the boxes containing Dungeness crab were marked “Unsafe for Human Consumption.” The people who had eaten some of the crab reported that they had gotten sick or had suffered some allergic reactions to eating the crab. People who had eaten some of the other food have reported diarrea [sic] and headaches. I have attempted to contact Exxon for an explanation, but have been unsuccessful so far (Kompkoff 1989c).

Later, the former village health aid received a call from a Russian Orthodox priest, who had contacted Exxon on the village’s behalf. Exxon had told him that they would pick up what was remaining of recent shipments of seafoods even though the food was of “top quality.” It was uncertain whether the priest was aware of the uncooked crab, the warning label, and the purpose of particular shipments as feed for sea otters, or whether he had informed Exxon of the nature of the concern.[15]

As a result of this incident, people in both communities were worried about eating resources from the shipments associated with the sea otter food, and discarded them. The word had gotten around that all the seafood coming in was “animal food.” When interviewed in April 1990, just a few households in the two villages reported receiving and keeping any resources from the shipments of “sea otter food.” The sea otter food incident compounded distrust of wild resource safety. Wild foods received from other emergency food programs were discarded, and some people became suspicious of marine invertebrates in general. For others, the incident confirmed their distrust of any subsistence foods.

[15] A brief summary of this incident also appears in Wheelwright (1994:249).

In addition to the sea otter food incident, other factors account for the differences between Exxon's estimates of the amount of wild foods provided through emergency programs and village respondent's own estimates. Recipients of foods from these programs reported extensive freezer burn on some fish; much had to be cut away before they could be used. Because the fish had been frozen, villagers found it difficult to process the fish in traditional ways, such as smoking and drying. Because much of the fish was received late in the year, the weather was not favorable for using these traditional methods of preservation. It is possible that portions of these shipments that were deemed usable were redistributed by Chenega Bay and Tatitlek residents to friends and relatives in Cordova and elsewhere. Exxon did not acknowledge a spill impact in Cordova and did not include the community in the food relief program.

Wild Resources: Kodiak Island Borough[16]

Following the EVOS, the Kodiak Island Borough "oiled mayors" asserted that given concerns about contamination and time spent in oil spill cleanup, subsistence users would not be able to put up enough salmon for the coming winter. After a variety of negotiations between the mayors, Exxon, the Borough, KANA, and ADF&G, an emergency subsistence salmon fishery at Karluk was opened. In September, a resident of Karluk organized a traditional beach seining operation for Karluk Lagoon. Volunteers were recruited by KANA and flown in from Port Lions and Larsen Bay to assist the Karluk crew. Observers from both DEC and ADF&G monitored the fishery and no visible signs of oil were found on the fish.

The mayors had requested that 90,000 pounds of subsistence fish be caught, but 68,000 pounds was actually harvested. About 30,357 pounds was delivered to Eagle Fisheries, where it was frozen. The rest, 37,936 pounds, was delivered to Alaska Pacific Seafoods where it was processed and canned.

After processing, it took a month for Exxon, the Borough, and KANA to decide on a distribution system. Eventually it was decided that elderly residents of the villages would be given priority in the distribution process. Within the Kodiak City area, subsistence permit holders (by family size) would be given priority, followed by other individuals in need. Distribution began on October 17, 1989, and fish were delivered to the communities frozen in 50-pound boxes and in 24-pound cases (48 half-pound cans).

During the first round, fish were delivered via an Exxon-chartered vessel. Some distribution mistakes were made and in a few cases the boat had to go back to communities to pass out more fish. Only Ouzinkie was equipped with a community freezer facility capable of handling the frozen fish deliveries.

In Port Lions, where the entire village council was out of town, the distribution task fell to the senior citizen cook. With no community freezer and many seniors lacking freezers, the fish were

[16] This account is based on a more detailed overview that appears in Mishler and Cohen (forthcoming).

distributed to any household with the freezer capacity to store them. This turned what was intended to be exclusively a senior citizen distribution into a general distribution in the village.

Another round of Exxon's fish distribution program took place during the third week in October and, according to the local Exxon representative, was to be a general distribution to the villages, based on size. During the third and final round, the remainder of the fish was distributed to Kodiak City residents using a Borough sign-up list that included subsistence permit holders. Some were given as charity to the Kodiak Women's Resource and Crisis Center and to the Salvation Army.

In the Kodiak communities, the formal distribution programs replaced some of the salmon that people would normally have harvested themselves, offsetting the potential scarcity of protein for people who count on their summer salmon harvest to get them through the winter. However, the programs did not address the variety of ways in which people usually put up their salmon, including smoking and drying. Nor were any other foods distributed to make up for the other fish, shellfish, and game that people were afraid to harvest after seeing the oil on the beaches and in the water. These programs also could not accommodate the cultural significance of traditional subsistence harvesting, processing, exchange, and distribution activities.

The 1989 harvest survey questionnaire administered by the division included questions about the amounts of fish households received and kept through the formal sharing programs (Table VI-5). As in the Prince William Sound communities, the quantities reported through the survey were lower than those reported by Exxon. Discarding of fish due to poor preservation may account for some of this difference.

In Ouzinkie, residents received fish through two separate formal distribution programs; the Exxon Subsistence Fish program and an Alaska Department of Community and Regional Affairs (DCRA) grant. Village leaders in Ouzinkie were suspicious of the fish caught in Karluk through Exxon's program, fearing they might be contaminated. They applied for and received a grant from DCRA and through that grant received frozen coho and sockeye salmon caught in Washington State.

<u>Groceries: Prince William Sound</u>

Beginning in April 1989, Exxon made several deliveries of grocery items to Chenega Bay and Tatitlek (Fall et al. 1996:69-72; Meidinger 1999:106-107). According to the company's community liaison manager,

> These deliveries were initiated because Exxon's cleanup efforts disrupted the normal supply system to these villages. In addition, of course, most of the able-bodied residents were working on the spill and may not have had time to do their normal subsistence gathering (Taylor 1991).

By Exxon's calculations, about 70,000 pounds of groceries (including food and other household supplies; this appears to be total weight, including packaging) were delivered to 20 Chenega Bay households, for an average of 3,500 pounds per household and 800 pounds per person. About 70,100 pounds were delivered to 29 Tatitlek households, for an average of 2,200 pounds per household and 670 pounds per person (Taylor 1991).[17] During a visit to Tatitlek in August 1989, division staff learned that at least three households in Tatitlek were sending portions of these groceries to needy friends and relatives in Cordova, since, according to Reynolds (1993:207-208), Exxon had declined to provide groceries to residents of Cordova, alleging that Cordova Alaska Native residents had not been affected by the oil spill.

Exxon reported that it also provided groceries periodically to Nanwalek and Port Graham from supply boats. No records are available concerning these deliveries (Taylor 1991).

LITIGATION OF THE OIL SPILL

Litigation has been a fundamental part of the aftermath of the *Exxon Valdez* oil spill. According to some research, litigation has been a major source of stress for persons attempting to recover from damages inflicted by the spill (e.g., Picou and Gill 1996). Other researchers maintain that litigation "mania" clouded or obstructed objective assessment of the effects of the spill and subsequent recovery (e.g., Davis 1996, Wooley 1995). Besides creating stress and affecting research, litigation has underscored the legal vulnerability of Alaska Natives in claiming compensation for damages to subsistence inflicted by the spill. Litigation highlighted the opinion that, although Alaska Native people may use natural resources for subsistence, ANCSA terminated their right to act as legal trustee for those resources.

Two kinds of law addressed the oil spill: federal statutes enacted to govern such events and maritime torts under which compensation may be available after statutory remedies have been exhausted. Of the three federal statutes addressed in this paper only the Trans-Alaska Pipeline Authorization Act (TAPAA) was enacted especially for oil spills occurring in the vicinity of the pipeline. As written, TAPAA provided strict liability for injuries resulting from accidents associated with the construction of the Trans-Alaska Pipeline and the transportation of oil once the pipeline was completed. TAPAA authorized recovery for three classes of damages: 1) cleanup costs, which go to state and federal agencies involved in cleanup, 2) damages sustained by private persons for property damage and economic loss and, 3) natural resource damages which include compensation to the public for non-reparable damages such as permanent loss of wildlife and fisheries.

At its inception TAPAA was organized into two sections: the Right-of-Way section that covers oil spills which happen along the pipeline right-of-way, an

d the Transport section that covers spills once the oil has left the pipeline and is being transported by ship. While it was obvious that all claims for private and ecological damages would be brought under the Transportation section it was unclear as to what damages were compensable. Unlike the Right-of-Way section, which recognized and provided for damages to subsistence resources, the Transport

[17] In a later estimate, Exxon's Native liaison reported that "in total, Exxon provided over 114,000 pounds of commercial food to Chenega and Tatitlek and distributed about 115,000 pounds of subsistence foods to all of the villages affected by the spill" (Meidinger 1999:107).

Section made no mention of compensation for damages to subsistence resources used by Alaska Natives. And, while TAPAA provided compensation for damages inflicted on the ecosystem, it was open as to who had the authority to assert such a claim. Almost immediately this authority was assumed by State and Federal agencies.

In January 1990, Judge Holland, the presiding judge in the case, directed the TAPAA administrator to solicit, receive and independently evaluate submitted claims for damages compensable under the TAPAA fund. In January of 1992 the TAPAA administrator denied Native subsistence claims to the fund arguing that the fund was limited to making awards for tangible economic losses only. To assess such damages it was necessary for plaintiffs to supply "individual filings and individual substantiation of claimed damage" and not aggregate data based on community harvests. In rejecting this approach the fund's administrator wrote, "While subsistence certainly has communal aspects, as argued by the appellants, it also has individual components. The approach argued by the appellants may be good sociology, but the approach is merely one approach and more importantly, the approach is contrary to binding law." Also rejected were claims made by Native community and regional organizations that they sustained economic loss because of the spill.

In addition to TAPAA, two other federal statues covered spilled oil. These were the Federal Water Pollution Control Act, more commonly known as the Clean Water Act, and the Comprehensive Environmental Response, Compensation and Liability Act, or CERCLA. The Clean Water Act aims primarily at reimbursing the federal government for removal and cleanup of oil spills exceeding ship owner or operator liability. The act established a maximum liability on the part of the owner or operator of the vessel at $150 per gross ton of vessel, which was 31 million dollars in the case of the *Exxon Valdez*. This liability cap could be lifted upon proof of gross negligence or willful misconduct on the part of the owners or operators. Compensation to private parties is not covered in this act.

CERCLA provides that in addition to cost recovery for response and cleanup actions, natural resource trustees may recover damages for injury to natural resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the federal government, any state or local government, any foreign government, or any Indian Tribe. Alaska Natives, however, did not fall within this group because they were considered to have relinquished their right to act as a trustee through ANCSA. It should be noted that the Oil Pollution Act (OPA) of 1990 altered this situation by permitting "recovery by an Indian tribe trustee for the loss of natural resources or the use of such resources and for damages for loss of subsistence use of natural resources without regard of ownership."

In March of 1991 Federal and State governments filed a natural resource damage suit against Exxon Corporation and the owner companies of the pipeline. Both the State and the Federal governments stipulated that only they were entitled to act on behalf of the public as trustees of natural resources and to sue under the Clean Water Act and CERCLA. Almost immediately plaintiffs and defendants reached a one billion dollar settlement that hinged, in part, on a criminal plea bargain for Exxon. A Federal judge threw out the plea bargain and the Alaska legislature rejected the settlement. Alaska Native plaintiffs sued to block the settlement claiming they were excluded from negotiations.

Alaska Natives had brought suit against the state and federal governments asserting their right to act as trustee for the purposes of "claiming, recovering, and using natural damage recoveries for the benefit of natural resources used by Natives for subsistence." But in September of 1991 the Natives, along with commercial fishermen, private landowners, cannery workers and other claimants dropped their suits against the State and Federal governments. For their part, Alaska Natives withdrew and waived any claim, right, or obligation to act as a trustee regarding natural resource damages. Native claimants reserved the right to pursue private claims other than claims for natural resource damage.

On September 30, 1992, Governor Hickel announced that the State of Alaska and the Federal Government had settled with Exxon and the owner companies of the Trans-Alaska pipeline. The agreement stipulated that any money collected from Exxon for natural resource damages would be collected exclusively by the governments, but private third parties could pursue claims for all damages. The State agreed to share research on damages inflicted by the oil spill with third party plaintiffs and to restore the natural resources injured by the oil spill, including those resources used for subsistence.

Eliminated from statutory solutions, Alaska Native plaintiffs turned to common law. In the case of the *Exxon Valdez* remedies for damages were brought under maritime tort, which fall under the Admiralty Extension Act, and thus lie within federal jurisdiction. Private claims are limited by established case law and in this instance that was *Robins Dry Dock & Repair Co. v. Flint.* This is the most prohibitive case for private parties attempting to recover for loss of subsistence resources or business profits without showing physical damage to property interests. In *Robins Dry Dock* the court held that there could be no recovery for private individuals who have suffered indirect economic loss. Exceptions to this rule are *Oppen v. Aetna Ins. Co*. and *Burgess v. M/V Tomano.* In both cases commercial fishermen were allowed indirect damages because they could demonstrate a special relationship with marine resources and consequently suffered "damages different in kind…from that sustained by the public generally."

Extensive litigation began in the weeks after the spill when 150 individual and class action lawsuits were filed against Exxon Corp. A sample of the cases filed in federal court included *North Pacific Rim v. Exxon Corp*. (a class action filed on the behalf of Native villagers in the Chugach region), *Thome v. Exxon Corp*. (class action by commercial fishermen), *McCudden v. Exxon Shipping* (class action on behalf of herring fisheries), and *Cesari v. Exxon Corp*. (class action on behalf of all persons "adversely affected"). Cordova District Fishermen United, longshoremen, and fish processing companies brought suit in State court. Eventually nearly all 150 lawsuits were consolidated into two class action suits, one covering commercial fishermen and the other covering Alaska Natives. Only the Alaska Native lawsuit is discussed here.

Initially, Alaska Natives pursued claims against Exxon for damages to their subsistence lifestyle or culture. These were eventually separated into claims for non-economic and economic damages. We will discuss the economic damages first.

Exxon attempted to obtain a summary judgment against the Native economic claims based on two points. First, it was argued that the Native class did not, nor intend to provide individualized proof of any loss. Exxon argued that because individuals within the class differed in terms of their harvest and consumption of wild resources it was impossible to fairly assess damages based on community harvest data. Plaintiff's attorneys argued that any claims relating to the damage of subsistence foods are communal in nature and can only be understood as such. Second, Exxon argued that plaintiffs looked to recover economic damages, which were unrelated to any physical injury or to property, which was a requirement of *Robins Dry Dock*. In this regard Exxon pointed out that plaintiff's allegations of injury were not tied to an injury of property that they owned but to a way of life.

Judge Holland refused Exxon's request for summary judgment. On the matter of individual proof of claim, Holland concurred that individuals must provide an account of their losses "because only those who suffered loses may share in the recovery." However, he noted that the law provides that proof of individual loss does not have to be provided immediately but only at the appropriate time. On the matter of whether the Native economic claim fit under the rules of *Robins Dry Dock*, Holland disagreed with Exxon. He wrote that while the court has refused to expand *Oppen* to include any group other than commercial fishermen, it need not expand it to include subsistence harvesters because Native subsistence harvesters fit within the *Oppen* exception. The court concluded, "whereas the spill reduced the commercial fishermen's profits because they could not sell the resource to a third party, it directly reduced the subsistence harvesters' immediate ability to consume that resource." As a result, Exxon settled the Native economic claim out of court for $20 million. The money was not distributed to the plaintiffs but used to maintain the Native's stake within the general class action against Exxon.

In regard to their non-economic claims, the Native class faired less well. Exxon asked and was granted summary judgment against the Native claim for compensatory damages for injury to "culture" or the "subsistence way of life." Exxon argued, and Holland agreed, that such "non-economic claims" are precluded by the rule of *Robins Dry Dock*. Exxon contended that the law allows claims only for private individuals who have suffered a direct physical harm, and also asserted that in this case *Oppen* did not apply because Native subsistence harvesters were not commercial fishermen but more "closely analogous to sports fishermen or others deprived of a non-commercial right to fish as a result of the oil spill."

Plaintiffs asserted that the oil spill caused damages to Alaska Native culture or the subsistence way of life "going beyond the economic losses resulting from the loss of the subsistence harvest." They argued that Alaska Native claims are recognizable under maritime nuisance law where a private individual can show a special injury, different in kind from that suffered by the general public. In essence, Alaska Natives argued that their subsistence culture was different in kind from that of non-Native Alaskans who practiced subsistence. Holland disagreed. He stated that while cultural differences do indeed exist between Alaska Natives and non-Natives this difference does not mean that Alaska Natives suffered damages different than non-Natives under the law. Judge Holland wrote (US District Court 1994:6):

> All Alaskan's have the right to lead subsistence lifestyles, not just Alaska Natives. All Alaskans, and not just Alaska Natives, have the right to obtain and share wild food, enjoy uncontaminated nature, and cultivate traditional, cultural, spiritual, and psychological benefits in pristine natural surroundings. Neither length of time in which Alaska Natives have practiced a subsistence

> lifestyle nor the manner in which it is practiced makes the Alaska Native subsistence lifestyle unique. These attributes of the Alaska Native lifestyle only make it different in degree from the same subsistence lifestyle available to all Alaskans.

In sum, Holland ruled that Natives could not sue on the basis of nuisance theory and could not claim a subsistence injury because this injury was not unique to the Native class.[18]

Holland went on to say that Exxon has already paid and will likely pay more and these funds are in trust arrangements designed to restore, augment and rehabilitate the natural resources damaged by the spill, and that Alaska Natives “should derive direct benefit from this effort.” Furthermore, Alaska Native culture has changed and, if the Alaska Native subsistence lifestyle was lost, it was lost before the grounding of the *Exxon Valdez*. In conclusion Holland noted, “[d]evelopment of the Prudhoe Bay oil fields…” were “in all probability, a much greater and certainly longer lasting incursion into Native Culture than the *Exxon Valdez* oil spill, yet the Inupiat have thrived.”

The trial for the class action suit pursued by commercial fishermen, Native people, businesses, and landowners moved in three phases. Decisions resulting from phase one determined that Exxon and Captain Hazelwood were liable for punitive damages because they had acted recklessly. Phase two decisions determined the actual damages, in this case for the 10,000 commercial fishermen who were awarded $287 million, a sum substantially lower than the $895 million claimed. Of the award, $58.8 million went to fishermen from Prince William Sound; $48.8 million was awarded to Cook Inlet fishermen; $45.1 million went to Kodiak fishermen; and fishermen from the Chignik Area received $5 million. The jury also made a $9.4 million award to cover the decline in the price of commercial fishing permits. At the conclusion of phase three of the trial, on September 16, 1994, the jury awarded $5 billion in punitive damages. If distributed, the award would equal approximately $357,000 per person. Lawyers involved in the suit will receive between 15 and 33 percent of the award.

Two years after the award Judge Holland filed the judgment that, in addition to approving the punitive award, $19.6 million in compensatory damages should be awarded beyond the amount already paid to commercial fishermen. Filing the judgment meant that the appeals process, which was expected to take about five years, could begin, and Exxon had to post a bond for the amount of the punitive damages, including interest (5.9% per annum) totaling 6.75 billion dollars.

As Wooley (1995:143) remarks, the presence of lawyers may have served to intensify impacts of the spill and masked uniquely Native responses. However, without litigation it is unlikely that Exxon would have done many of the things it did to compensate people. Litigation also led to changes in oil spill legislation so that in the event of another oil spill Native people will be more adequately represented. But, as Fall and Utermohle (1995) point out, the view persisted that “the cultural importance of subsistence to

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18 Jorgensen (1995a:6) observes that Judge Holland’s findings about Alaska Native culture in the EVOS area were likely influenced by submissions to the court and depositions by anthropological experts employed by Exxon (e.g., Bohannan 1993a, 1993b). (See also Chapter One.) Two of these experts summarized their perspective in a submission to an anthropological journal (Wooley and Bohannan 1994) that also was part of the court record, and was later modified for publication (Wooley 1995). In a summary of findings of the Social Indicators research undertaken for MMS, Jorgensen (1995a) describes significant differences in responses by Natives and non-Natives to the EVOS that he attributes to cultural differences.

the Alaska Native communities of the spill area and injury that these cultures suffered had not yet been acknowledged by the judicial process." In September of 1996 the Native Class appealed Holland's ruling to the federal 9th Circuit Court of Appeals. In 1997, the Court rejected the appeal, agreeing with Holland that the Natives' economic claim had been settled and that there was no basis in law for awarding damages for cultural claims. Like Holland, the appeals court concluded that the non-economic injury suffered by Alaska Natives was perhaps different in degree from that suffered by other Alaskans, but it was not different in kind.

The 9th Circuit Court of Appeals heard arguments in Exxon's appeal of the $5 billion punitive damage award in Seattle on May 4, 1999. Exxon argued that the damage award was excessive, served no public purpose, and "cannot be justified because punitive damages are not intended to make private plaintiffs rich" (Phillips 1999). In October 2000, the US Supreme Court rejected Exxon's argument that the punitive award should be set aside due to alleged irregularities during jury deliberations. Because Exxon was pursuing appeals on other grounds as well, a company spokesman said that the company was "not even close" to paying anything to plaintiffs (Associated Press 2000).

RESTORATION AND THE OIL SPILL TRUSTEE COUNCIL[19]

In October 1991, the United States District Court approved a settlement of the civil claims of the State of Alaska and the United States against Exxon for natural resource damages caused by the spill. Under this agreement, Exxon agreed to pay $900 million over a ten-year period. Most of these funds were deposited in a restoration fund administered by a six-member Trustee Council. The Trustee Council is composed of three federal and three state representatives. Under the terms of the court approved Memorandum of Agreement, these restoration funds, called "civil settlement funds" in this report, must be used,

> For the purposes of restoring, replacing, enhancing, or acquiring the equivalent of ***natural resources*** injured as a result of the Oil Spill and the reduced or lost ***services*** provided by such resources (EVOSTC 1994:3-4; emphasis in the original).

A "service" is defined in this context as a human use of natural resources. Subsistence is one of several reduced or lost services for which restoration projects may be funded by the Trustee Council.

In 1994, the Trustee Council adopted a Restoration Plan to guide its restoration program. The plan is organized by an "ecosystem approach" defined by two policies (p.12):

1. Restoration should contribute to a healthy, productive and biologically diverse ecosystem within the spill area that supports the services necessary for the people who live in the area, and,

[19] The section on the subsistence restoration planning process is based largely on Fall (1995b).

2. Restoration will take an ecosystem approach to better understand what factors control the populations of injured resources.

The Restoration Plan also describes five categories of restoration activities. These are:

1. General Restoration, such as "manipulation of the environment," "management of human use," or "reduction of marine pollution,"
2. Habitat Protection and Acquisition, including purchase of private land or interests in land such as conservation easements, mineral rights, or timber rights (see below for a review of the status of this program),
3. Monitoring and Research, such as gathering information about the recovery status and conditions of resources and services,
4. Restoration Reserve, annual payments into an account to fund restoration actions past 2001, when the final Exxon payment takes place, and
5. Public Information, Science Management, and Administration, such as preparing work plans, providing scientific review, public involvement, and operating the restoration program.

The Restoration Plan contains the following "recovery objective" for subsistence uses:

> Subsistence will have recovered when injured resources used for subsistence are healthy and productive and exist at prespill levels, and when people are confident that the resources are safe to eat. One indication that recovery has occurred is when the cultural values provided by gathering, preparing, and sharing food are reintegrated into community life (EVOSTC 1994:55).

The Restoration Plan also notes that,

> Subsistence users say that maintaining their subsistence culture depends on uninterrupted use of resources used for subsistence. The more time users spend away from subsistence activities, the less likely they will return to the activities. Continuing injury to natural resources used for subsistence may affect the way of life of entire communities (EVOSTC 1994:54).

In 1994, the Trustee Council funded a Subsistence Restoration Planning and Implementation Project to design a coordinated approach to subsistence resource restoration and to implement a planning process to develop subsistence restoration project proposals for the Trustee Council work plans for federal Fiscal Year 95 (FY 95), FY 96, and beyond. A further goal was to ensure the participation of subsistence users in these and other planning efforts. Such projects could propose to directly restore resources used for subsistence, provide alternative natural resources, or restore access or people's use of the resource. The project was to develop guidelines for project content, solicit project ideas and priorities through a public process, evaluate project proposals, and present a set of project proposals to the Trustee Council for funding consideration from the Restoration Fund.

The planning team's efforts to develop a "comprehensive approach" to subsistence restoration encountered obstacles. A comprehensive approach would have fully and openly addressed spill issues and effects as they relate to the resource base, technology, and the sociocultural context which supports subsistence activities, including resource exchange, enculturation of the young, traditional knowledge, and cultural values. As the planning effort was getting underway, the Trustee Council was developing its draft Restoration Plan (EVOSTC 1993b). The draft plan (p.12) listed the following policies to guide projects designed to restore or enhance an injured service:

1. must have a sufficient relationship to an injured resource,
2. must benefit the same user group that was injured, and
3. should be compatible with the character and public uses of the area.

Requirement (1) proved to be a primary guide as well as a limiting factor in the subsistence restoration planning project. Following several meetings with Trustee Council staff and attorneys, the planning team concluded that a comprehensive approach to subsistence restoration that addressed the environmental, social, and cultural dimensions of the subsistence way of life would not be possible. Consequently, the team decided to emphasize to communities the need to link project proposals to natural resource recovery. The planning team strove to demonstrate connections between subsistence restoration project ideas and natural resource recovery that might not be readily apparent. For example, the Trustee Council funded an elders/youth conference because one goal of the conference was to discuss ways in which subsistence users could support natural resource restoration and conservation. As a result, projects such as the elders/youth conference, a harbor seal hunting documentary, and a harbor seal/sea otter restoration project received funding support from the civil settlement money.

As illustrated in Figure VI-2, the concentrated subsistence restoration planning effort had a measurable impact on funding for subsistence restoration. Funding for subsistence restoration projects increased from nothing in Fiscal Year [FY] 92 and $300,000 in FY 93, to about $1 million in FY 95 and peaked at over $1.4 million in FY98. Additionally, the portion of these funds going to projects or portions of projects directed by or proposed by local communities or Alaska Native organizations jumped substantially; about $1 million of the $1.2 million allocated in FY 96 went to such projects, as did about $1.15 million of $1.32 million in FY97 and $1.16 million of $1.45 million in FY97. Table VI-6 lists the projects that were funded in the Trustee Council's "subsistence restoration category" from FY92 through FY01, and projected to be funded through the duration of the restoration program in FY02.

As depicted in Figure VI-3, the percentage of funds awarded by the Trustee Council targeted towards subsistence restoration grew from nothing in FY92 to about 13.2 percent in FY00, but remained relatively small part of the overall restoration program. Of all funds allocated by the Trustee Council for monitoring, research, and general restoration from FY92 through FY02, 7.3 percent were in the subsistence restoration category, ranking fifth among the 18 categories used by the Trustee Council to track and report uses of the Restoration Fund (Fig. VI-4).

Additional aspects of the subsistence restoration process that were long-term consequences of the spill were a community involvement project and a traditional ecological knowledge (TEK) project. As part of the former, "community facilitators" were hired through a contract with the Chugach Regional Resources Commission (CRRC), an Alaska Native regional organization, to assist communities in participating in the restoration process. Facilitators were hired to represent the communities of Cordova, Valdez, Tatitlek, Chenega Bay, Seward, Seldovia, Nanwalek, and Port Graham. In addition, there was one facilitator for the Kodiak Island Borough communities and another for the five Alaska Peninsula villages in the spill area.

The TEK project was designed to encourage the use of TEK in restoration science. The Trustee Council adopted "Protocols for Including Indigenous Knowledge in the *Exxon Valdez* Oil Spill Restoration Process" (EVOSTC 2000:Appendix C) and hired a "TEK specialist" through CRRC to assist researchers in developing a TEK component to their projects. The Division prepared a "TEK Handbook" (Miraglia 1998) as part of this effort. Most restoration projects did not develop a TEK component, but there were some notable exceptions. Project 009 included interviews with local residents as part of an effort to understand the effects of the oil spill on octopus. Project 247 collected substantial indigenous knowledge about coho salmon in an effort to restore runs in the Kametolook River.

Figure VI-2. Allocations to Subsistence Restoration Projects, Oil Spill Restoration Work Plans (Civil Settlement Funds)

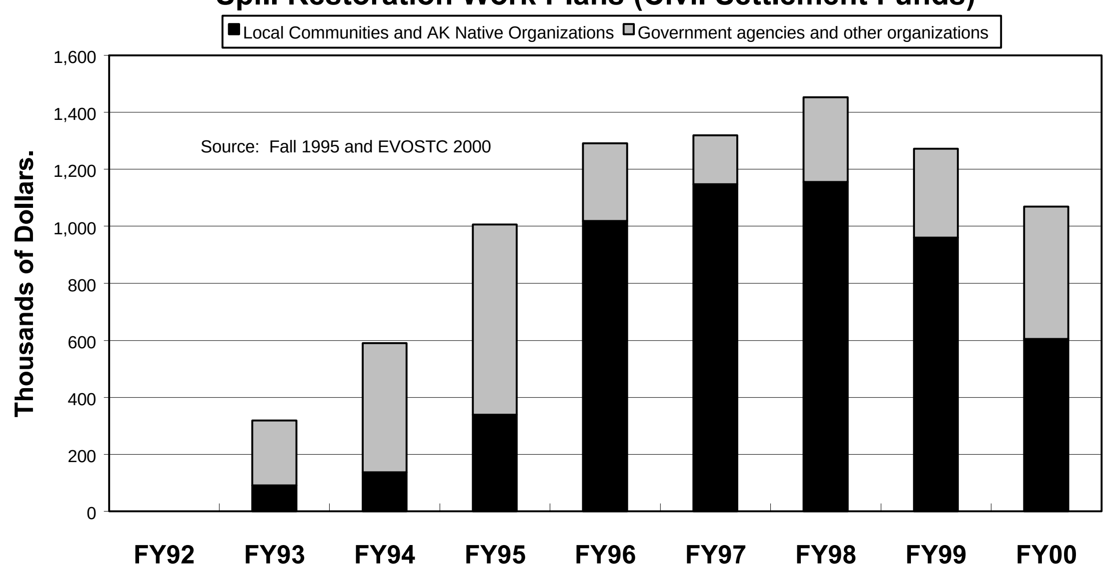


Table VI-6. Civil Settlement Subsistence Restoration Projects

#	Name[1]	Communities	Total Allocation	Fiscal Years (federal) FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02
009D	Survey of Octopuses in Intertidal Habitats	PWS & LCI	$314.2				X	X	X					
052	Community Involvement and Use of Traditional Knowledge	All	$930.2				X	X				X	X	X
052A	Community Involvement	All	$722.8						X	X	X			
052B	Traditional Knowledge	All	$192.1						X	X	X			
127	Tatitlek Coho Salmon Release	Tatitlek	$68.0				X	X	X	X	X	X		
131	Clam Restoration	PWS & LCI	$1,439.9				X	X	X	X	X			
138	Elders/Youth Conference	All	$75.1				X							
210	Area Youth Watch	PWS & LCI	$876.1					X	X	X	X	X	X	X
214	Harbor Seal Documentary	Tatitlek	$80.5					X	X					
220	Eastern PWS Salmon Habitat Restoration	Cordova	$118.6					X	X	X				
222	Chenega Bay Salmon Habitat Enhancement	Chenega Bay	$3.8					X						
225	Port Graham Pink Salmon Project	Port Graham	$385.7						X	X	X	X		
244	Community Harbor Seal Sampling/Management	All	$437.6			X	X	X	X	X				
245	Community-Based Harbor Seal Biosampling	All	$127.2								X	X	X	
247	Kametolook River Coho Salmon	Perryville	$126.8						X	X	X	X	X	X
256B	Solf Lake Salmon Stocking	Chenega Bay	$497.8					X	X	X	X	X	X	X
263	Port Graham Salmon Stream Enhancement	Port Graham	$230.4						X	X	X	X		
272	Chenega Chinook Release Program	Chenega Bay	$202.6		X	X	X	X	X					
273	Surf Scoter Life History and Ecology	PWS	$567.2							X	X	X		
274	Herring/Nearshore Documentary	Tatitlek	$87.8							X				
279	Food Safety Testing	All	$676.8		X	X	X							
286	Elders/Youth Conference	All	$100.1						X	X				
401	Spot Shrimp Population	Valdez	$255.0								X	X	X	X
428	Subsistence Restoration Planning	All	$151.4			X	X							
481	Documentary on Intertidal Resources	Chenega Bay, Ouzinkie	$120.4									X	X	
482	Optimization of Test Kits for PSP and ASP	Kodiak Island	$55.6									X		
610	Kodiak Island Youth Area Watch	Kodiak Island	$185.4									X	X	X
471	Updating the Status of Services	PWS, LCI, Kodiak	$203.7							X	X			

[1] All included in the Subsisence Restoration category except 471, which was included in Public Information/Science Management/Administration

Source: EVOS TC 2000:B16-B21

Figure VI-3. Percentage of EVOS Trustee Council Restoration Workplan Allocated to Subsistence Restoration Projects and Other Projects

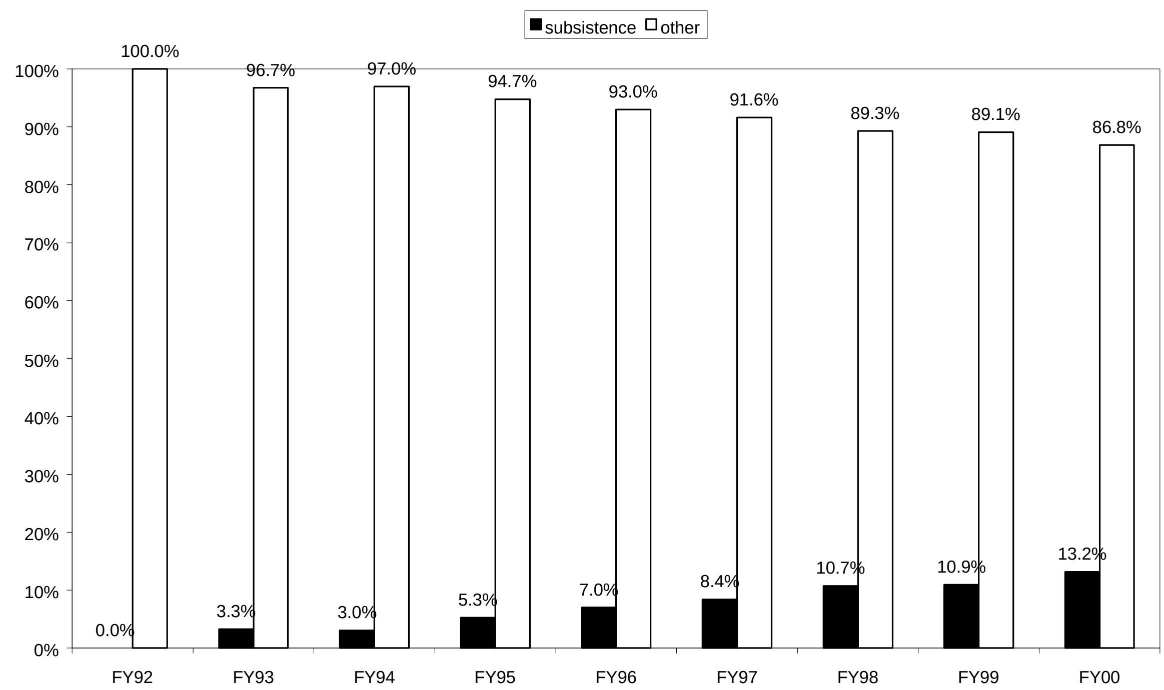
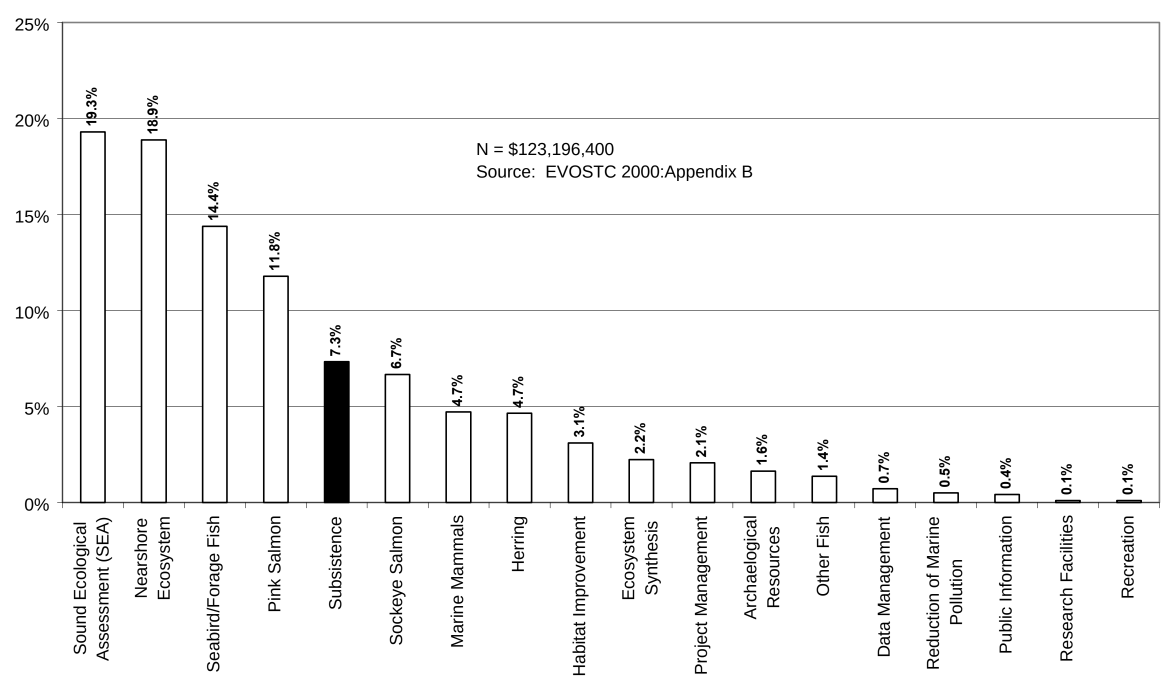


Figure VI-4. Percentage of Restoration Funds Allocated for Monitoring, Research, and General Restoration by Category, FY92 to FY02



Understanding the restoration process as part of the long-term consequences of the spill is important for several reasons. The Trustee Council is a prime example of a powerful new bureaucracy that emerged after the spill, which competes with community residents, among others, to define the meaning of the event. For the Trustee Council, the spill was, primarily, a "natural disaster," in the sense that it defines the spill's effects in terms of the natural environment and injured populations of plants and animals. The effects on human communities and to people can only be approached through restoration of the natural environment. Residents of the spill area view the spill effects more broadly, more "ecologically," with social, cultural, and psychological impacts that are not being directly addressed by the restoration process, or by the courts. Residents have therefore proposed funding for projects that test the boundaries of what the Trustee Council considers acceptable under the settlement agreement between Exxon and the state and federal governments. Thus, the restoration process is essentially a process of negotiating two interpretations of the spill, and as such has been both a source of frustration and a source of support for people concerned with the sociocultural consequences of the spill. Projects funded through this process also provided a source of cash to communities that may be used to support the cash sectors of local economies and provide technology and infrastructure for the subsistence sector (see Chapter 9).

THE CRIMINAL SETTLEMENT SUBSISTENCE RESTORATION PROGRAM

In 1991, under a criminal plea agreement, Exxon agreed to pay restitution of $50 million to the United States and $50 million to the State of Alaska. These funds are managed separately by the respective governments and are not under the authority of the Trustee Council. The Alaska Legislature authorized DCRA to award grants from a $5 million appropriation from these criminal settlement funds to unincorporated rural communities in the oil spill area in order to restore, replace, or enhance subsistence resources or services damaged or lost as a result of the spill (Section 11, Chapter 79, SLA 1993). There are nine such communities: Tatitlek, Chenega Bay, Port Graham, Nanwalek, Karluk, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay. The legislation requires that selection of grant recipients shall be made after consultation with the state members of the Trustee Council. Project ideas developed through the Trustee Council-funded subsistence restoration planning process (see above) but not incorporated in the Trustee Council's FY 95 Work Plan could be eligible for funding through the grants. State of Alaska attorneys advised the planning team that while a link to injured natural resources was still necessary for projects funded from the criminal settlement, this link did not need to be as direct as for civil settlement funding. Consequently, projects that addressed aspects of subsistence activities such as disruption of the transmission of traditional knowledge and skills, and development of alternative resources or harvest areas, had a better chance of funding from the criminal settlement money. The Alaska Legislature made an additional appropriation of $1,219,611 to this program in January 1999..

Through July 2000, 32 projects from all nine eligible communities had been funded with a total commitment of $5,628,325 (Table VI-7). These projects covered most of the spill area. They also supported a diversity of projects, including natural resource enhancement and management, mariculture, cultural education, cultural preservation, and fish processing facilities.

THE HABITAT PROTECTION PROGRAM

As noted above, “habitat protection” is one of the components of the Trustee Council’s “ecological approach” to oil spill restoration. This entails purchasing land or development rights to that land from private land owners. Much of the privately-owned land in the spill area belongs to Alaska Native regional and village corporations formed under the Alaska Native Claims Settlement Act (ANCSA). Lands acquired through this program are managed by state or federal agencies as part of conservation system units, such as the Chugach National Forest and the Kodiak National Wildlife Refuge.

Table VI-8 summarizes land acquisitions under the habitat protection program through early 1999. The large majority of lands acquired through this program have been obtained from Native corporations.

The habitat protection program is not without controversy. For some, sale of Native lands simply means the irrevocable loss of control of the traditional territory of their communities. Some fear that access to these lands for subsistence activities is at stake, while others see these agreements as acceptable ways to obtain revenues for shareholders while protecting natural resources used for subsistence. Disagreements within corporations and communities about the wisdom of these sales have resulted in factionalism and stress in some communities, and could result in long-term demographic change. Other issues pertain to how the money obtained from these sales is distributed and managed. Options include individual dividends, development of community facilities and infrastructure, group investments for long-term cash income, or a combination of these alternatives. These choices could shape the balance of the mixed subsistence/cash economies of the Native communities of the spill area. These topics are discussed in Chapters Seven and Eight.

A major facet of the EVOS Trustee Council’s restoration program is habitat protection. This program has a larger share of the civil settlement dollars allocated to it than any other part of the restoration effort. According to the EVOS Trustee Council Status Report, $392 million is committed to habitat protection, including “large parcel and small parcel habitat protection programs (past expenditures, outstanding offers, estimated future commitments and parcel evaluation costs)” (EVOSTC 1998b: 28). In addition, the Trustees have decided to commit $55 million of the estimated $170 million that will be in the restoration reserve (a fund set aside from the civil fund to pay for restoration actions needed after Exxon makes its final payment in 2001) to be spent on additional habitat protection beginning in 2002 (EVOSTC 1999: 1, 10).

Table VI-7. Subsistence Restoration Projects Supported with Criminal Settlement Funds

Project and Project Type	Community	Approved[1]	Awarded[2]	Award
Fish Stock Enhancement				
Chignik River Weir (supplement)	Chignik Lagoon	5/10/96	5/10/96	$28,000
Chignik River Weir (supplement)	Chignik Lagoon	8/13/99	9/15/99	$154,844
Chignik River Weir Operation Extension	Chignik Lagoon	8/2/95	8/8/95	$120,750
English Bay River Sockeye Rehabilitation	Nanwalek	11/3/94	11/29/94	$424,200
English Bay River Sockeye Salmon	Nanwalek	8/13/99	9/15/99	$145,000
Sockeye Salmon Rearing Pens	Nanwalek	5/16/98	7/10/98	$109,500
Kametolook River Coho Enhancement[5]	Perryville	4/3/96	5/2/96	$16,763
Pink Salmon Enhancement	Port Graham	8/13/99	9/15/99	$145,000
Port Graham River Coho Rehabilitation	Port Graham	8/2/95	8/8/95	$438,800
Salmon Incubation Facility	Port Graham	5/16/98	7/14/98	$139,600
Subsistence Facilities (Infrastructure)				
Chenega Bay Subsistence Support[7]	Chenega Bay	11/3/94	11/29/94	$85,000
Fish and Game Processing Building	Chenega Bay	8/13/99	9/15/99	$260,000
Education and Processing Center	Chignik Lagoon	4/3/96	4/17/96	$500,000
Education and Processing Center	Chignik Lake	4/3/96	4/17/96	$500,000
Processing Center	Ivanof Bay	4/3/96	4/17/96	$150,000
Processing Center	Perryville	4/3/96	4/17/96	$150,000
Floating Skiff Dock	Port Graham	5/16/98	7/14/98	$82,500
Floating Skiff Dock (supplement)	Port Graham	8/13/99	9/6/99	$20,000
Fish and Game Processing Equipment	Tatitlek	8/13/99	9/15/99	$10,000
Fish and Game Processing Facility	Tatitlek	11/3/94	11/23/94	$187,000
Cultural Education				
Subsistence Education Program	AKP Villages[4]	4/3/96	4/17/96	$50,000
Archaeology Display Equipment	Chignik Lake	11/23/99	11/24/99	$71,000
Kodiak Youth Spirit Camp	Karluk[6]	4/3/96	5/2/96	$250,000
Spirit Camp[9]	Nanwalek	8/13/99	9/15/99	$24,000
Subsistence Education Center	Perryville	3/31/95	4/20/95	$125,000
Sub. Stewardship & OS Recovery Gathering	Tatitlek	3/22/00	3/22/00	$20,000
Nuchek Spirit Camp	Tatitlek[3]	11/3/94	3/7/95	$228,000
Subsistence Management Education Program	Tatitlek		4/29/99	$12,000
Local Mariculture Development				
Chenega Mariculture	Chenega Bay	11/3/94	6/7/95	$337,300
Tatitlek Mariculture	Tatitlek	11/3/94	11/23/94	$387,600
Tatitlek Mariculture, Capital Outlay	Tatitlek	11/3/94	11/23/94	$606,000
Complete Mariculture Facility	Tatitlek	6/1/99	6/24/99	$51,987
Total Awarded, as of 7/00				**$5,628,325**
Balance of $6,219,611 Available, 7/00[8]				**$591,286**

1 Date of State Trustee Council members' consultation and endorsement.

2 Date of award of grant by commissioner of the Department of Community and Regional Affairs.

3 Grant administered by Chugach Heritage Foundation. Participation by all Chugach Region communities.

4 To be developed by the Lake and Peninsula Borough for the five Chignik Area communities.

5 Preliminary award, pending Trustee Council decision to fund remainder from the civil award; estimated total cost of $78,226.

6 Grant administered by the Kodiak Area Native Association. Participation by all Kodiak Island Borough communities.

7 Original award of $100,000 later reduced to $85,000

8 Original appropriation was $5,000,000. In January 1999, the Alaska Legislature made an additional appropriation of $1,219,611 to the program.

9 At the request of the Nanwalek Village Council, the State Trustrees approved reassigning these funds to a Sugtestun Language Immersion Program on August 8, 2000.

Source: Gliva 2000

Table VI-8. *Exxon Valdez* Oil Spill Trustee Council Habitat Protection Program, July 2000

				Price	
Program	Date	Size (acres)	Type of Sale	Trustee Council	Total
Large Parcel Program (acquisitions complete)					
Afognak Joint Venture[6]	Apr-98	41,350	surface title	$74,133,824	$74,133,824
		400	conservation easements		
Akhiok-Kaguyak	May-95	73,525	surface title	$36,000,000	$46,000,000
		42,448	conservation easements		
Chenega	Jun-97	37,236	surface title	$24,000,000	$34,000,000
		22,284	conservation easements		
English Bay[1]	Feb-97	32,537	surface title	$14,128,074	$15,371,420
Eyak[2]	Jul-97	55,357	surface title	$45,100,000	$45,100,000
		6,667	conservation easements		
		13,401	timber easements		
Kachemak Bay State Park inholdings[3]	Aug-93	23,800	surface title	$7,500,000	$22,000,000
Koniag[4]	Nov-95	59,674	surface title	$19,500,000	$26,500,000
		55,402	conservation easements thru 2001	$2,000,000	$2,000,000
Old Harbor	May-95	28,609	surface title	$11,250,000	$14,500,000
		3,000	conservation easements		
		65,000	preserved as "private wildlife refuge"		
Orca Narrows (Eyak Corp.)	Jan-95	2,052	timber rights	$3,450,000	$3,450,000
Seal Bay/Tonki Cape	Nov-93	41,549	surface title	$39,549,333	$39,549,333
Shuyak Island[5]	Dec-95	26,665	surface title	$42,000,000	$42,000,000
Tatitlek	1996&97	32,284	surface title	$24,550,000	$34,550,000
		37,530	conservation easements		
Totals		700,770		343,161,231	399,154,577
Small Parcel Program	01/01/99	8,257	fee simple purchase	$21,700,000	
45 parcels (completed acquisition or offers pending)					

1 2,901 acres of English Bay package still waiting to close
2 Approximate acreage. Closing completed but transfer pending approval by shareholders on parts of package.
3 Acquired "private inholdings" from the Seldovia Native Corporation.
4 Continuing negotiations with Koniag concern fee title to 55,402 acres along the Karluk and Sturgeon rivers protected under temporary easement which expires in December 2001. Under negotiation was an extention of the easement until December 2011,after which Koniag could choose to sell the land or extend the easement for another ten years (EVOSTC 2000:1,7).
5 Purchased from the Kodiak Island Borough; $6 million of the sale was committed to expand the Fishery Industrial Technology Center.
6 Made up of several Native corporations with holdings on Afognak Island.

Source: EVOSTC 1996b:23-24; 1996c:1-2; 1999; 2000; and web site (EVOSTC n.d.)

The goal of the habitat protection program is to protect the habitat of resources injured in the spill from further degradation by development, including logging and mining. There are two components of the habitat protection program; the large parcel program involving blocks of land in excess of 1,000 acres, and the small parcel program involving blocks of land smaller than 1,000 acres (EVOSTC 1998b:19).

In practice, the large parcel program has involved the transfer of lands from Native ownership to federal or state ownership. Lands purchased in fee simple with funds from the civil and criminal Exxon settlements are conveyed to the state or federal agency managing adjacent lands. Negotiations have been conducted with the regional and village corporations in the oil spill impact area. The Trustee Council has a policy of considering large parcel land packages only if they include a significant proportion of fee simple land sales (Barnes 1999). The village corporations of both Chenega Bay and Tatitlek have enacted land deals with the Trustee Council.

In February 1997, Chenega Corporation signed an agreement with the Trustee Council covering 59,520 acres. Chenega Corporation sold about half of its land holdings in fee simple. They sold conservation easements in perpetuity on much of the remaining land, including nearly all of Chenega Island. In compensation, the corporation received $34 million, $10 million of which came from Exxon's criminal settlement with the federal government, with the balance coming from the civil settlement funds (EVOS Trustee Council 1997). Some of the money was distributed to shareholders in an initial disbursement in January 1997, rumored to be between $30,000 and $47,000 per 100 shares (Miraglia 1997). Some $14 million of the proceeds were placed in an irrevocable trust that will provide shareholder dividends in perpetuity (Chenega Corporation Board of Directors 1999: G-4). Chenega Corporation retained the northern third of LaTouche Island, its holdings on Evans Island, and the site of the former village on Chenega Island, with no easements or restrictions.

In the spring of 1998, Tatitlek Corporation and the EVOS Trustee Council reached agreement on a habitat protection package. The corporation received $34,550,000, with $10 million from Exxon's criminal settlement with the federal government, the balance from the civil settlement, in exchange for a combination of conservation easements, timber easements, and fee simple land transfer on 68,914 acres. Roughly half of the acreage was transferred in fee simple (EVOS Trustee Council 1998a: 7).

Each of these land agreements contains a clause reserving subsistence rights for community residents on the lands sold in fee simple to the United States. The clause from the Chenega agreement is summarized as follows:

> Reserved for the residents of Chenega Bay is a subsistence access easement, which authorizes the residents to enter upon and travel across the land conveyed for the purposes of engaging in subsistence. The reservation of this right does NOT [emphasis in original] mean that Chenega Bay residents have exclusive rights to use the land for subsistence; it DOES mean that, if Congress amends Title VIII of ANILCA, the residents of Chenega Bay have the right in perpetuity to use the land for subsistence in the manner that currently exists under Title VIII (Lisowski 1998: 2).

The habitat acquisition process has its critics within the Alaska Native community. Among them are most of the EVOS "community facilitators." The community facilitators expressed their concerns in a letter addressed to the Trustee Council Executive Director in January 1997:

> As you know, many of us are opposed to the Habitat Acquisition Program. The reasons for this are many, but the main concerns are: a) Tribal Governments are not consulted in this process. The creation of for-profit corporations who are tasked with making a profit for their shareholders has created this belief that Tribal Government[s] have no say in this process since the contract is negotiated between the Trustee Council and the corporations. The philosophies of tribal governments and for profit corporations are at odds due to the profit making nature of the corporations. The Trustee Council must take this "tribal philosophy" into consideration when negotiating land sales through the habitat acquisition program; b) the land sales are based upon a vote by the corporation shareholders, many of whom do not live in the villages or have any ties to the village, so are more readily apt to vote for such a proposal [than] those of us who live here and depend on these resources for our livelihood; c) many of the village councils in the oil spill affected area are establishing traditional natural resource management programs to manage the resources utilizing traditional knowledge and western science. We feel that the habitat acquisition program is a slap in the face of these efforts in that this is a statement that we do not have the knowledge or capability to manage these resources wisely, so the federal/state government must purchase these lands back so that they can managed properly. It seems to be quite ironic, since we, as traditional managers, were not the ones who created the oil spill. The real tie to restoration, in our opinion, is ensuring that these natural resources upon which we depend are managed at the local level, thus providing meaningful employment opportunities in the communities and providing a sense of contributing to the restoration process (Community Involvement Facilitators, et al. 1997)

As is pointed out in the letter (b), shareholders in the village corporations are not all community residents and conversely, not all community residents are shareholders. Under ANCSA, each eligible Alaska Native who was living in 1971 was issued one hundred shares in the regional and village corporation in which they enrolled. Shares were not issued to anyone born after December 18, 1971, the day Congress passed ANCSA (Berger 1985: 25). Individuals born since 1971 can only obtain shares through inheritance, or pursuant to a court decree of separation, divorce or child support (ANCSA 1971). These limitations on transfer of stock were extended in 1991. Therefore, unless he or she had inherited stock in the village corporation, an Alaska Native resident of a village born after 1971 would not have any shares, and would not have a say in village corporation transactions. This also means that proceeds from the land sales are unequally distributed. For example, less than half of Chenega Corporation shareholders were residents of Chenega Bay at the time of the Chenega land sale, and not all residents of Chenega Bay were shareholders. This issue divided those who wanted to keep the land from those who wanted to sell. It also divided shareholders from the younger members of their own families who do not own shares because they were born after 1971.

In Chenega Bay, the land sale was a particularly contentious issue. For example, community members reported that some people were fired from their jobs because of their vocal opposition to the land sale (Miraglia 1996).

Some Chenega Bay residents have asserted that the land sale was carried out without proper consultation with the tribal government, the Chenega Bay IRA Council (Miraglia 1997). This assertion is based, in part on ANSCA section 3.(j), which defines a "Village Corporation" as:

> …an Alaska Native Village Corporation organized under the laws of the State of Alaska as a business for profit or nonprofit corporation to hold, invest, manage and/or distribute lands, property, funds, and other rights and assets for and on behalf of a Native Village in accordance with the terms of this act (ANCSA 1971: 3).

These residents contend that the phrase "for and on behalf of" indicates the intention of Congress that the village corporation be responsive and responsible to the village government, and therefore should not have sold village lands without the approval of the village government. They also point to the 1991 amendments to ANCSA, in which Alaska Land Bank provisions are automatically extended to include lands conveyed under ANCSA. Section (d)(3) states that:

> Action by a trustee: (A) Except as provided in this paragraph and in <u>section 14(c)(3)</u> of the Alaska Native Claims Settlement Act no trustee, receiver, or custodian vested pursuant to applicable Federal or <u>State</u> law with a right, title or interest of a <u>Native</u> individual or <u>Native Corporation</u> shall; (I) assign or lease to a third party; (ii) commence development or use of, or; (iii) convey to a third party, and right, title, or interests in land, subject to the exemptions described in paragraph (1) (United States 1990:2-3).

Chenega Bay residents who opposed the land sale asserted that the trust role of the Federal government in relation to Native lands did not end with ANCSA. They charged that the Federal government's pursuit of the purchase of lands conveyed under ANCSA was a violation of their trust responsibilities and was prohibited under Alaska Land Bank provisions (Miraglia 1999).

A community leader in Chenega Bay who was opposed to the land sale said the primary reason so many shareholders were for the land sale was that their finances were in bad shape and they were being told they would still have use of the land after selling it. She said they seemed to think they would get a lot of money and not really lose anything. She said the land deal was being sold to shareholders with the line, "You will never need money again." According to this respondent, the corporation was told that the Trustee Council would fund a Chenega Bay Cultural Center if they agreed to the land sale, and funding for additional beach cleanup was also made contingent on support for the land sale (Miraglia 1996).

This individual was concerned that once the land was gone, Chenega would become part of a new "Valdez-Cordova borough," in the process losing much of its power to make decisions affecting the daily lives of community residents. She feared, for example, the Chenega Bay School and its budget could fall under the control of the borough government. In her opinion, the only reason Chenega had a voice at all in the oil spill and its aftermath was because of the residents' status as land owners. She saw a landless Chenega as voiceless and powerless. She feared a future in which the U.S. Forest Service could change the rules with regard to subsistence uses of the National Forests (much of the land sold by Chenega Corporation in fee simple has been made part of the Chugach National Forest). If this happened, in her view, Chenega would have no say. This person was of the opinion that some recent immigrants to Chenega came to take advantage of the post-spill boom and to take part in any settlement. She partly blamed this group of people for the land sale (Miraglia 1996).

A resident who supported the land sale stated that it was done to preserve the land and stop the logging. In his view, logging would have been detrimental to tourism, and would have had an adverse effect on wildlife. This person felt that the opening of the road to Whittier would open the western side of the Sound to tourism, and he wanted the community to be in a position to take advantage of related opportunities. By selling the land rather than logging it, he stated, the value of the land for tourism is preserved, and shareholders obtain the capital needed to get a start in the tourism industry. He pointed out that under the terms of the land deal, community residents retain the right to subsistence hunt and fish on the lands they sold. He said that preservation of subsistence is better with the lands sold than it would have been if those lands had been logged. He believed that regardless of land ownership, the voice of the village would still be heard, saying, “Even if we had a million acres of land, if what we were saying went against the rest of society would they listen to us then? If what we have to say is pertinent, we will be heard, whether we own land or not” (Miraglia 1996).

A third resident said he believed that the sale of Chenega Corporation lands, and the “invasion” of the community by outsiders will have more of an effect on the community than the spilled oil. In his view, the full impact of the land sale cannot yet be fully understood. He thought that the younger generation, the children of the shareholders who do not themselves own shares in the corporation, will return to the village because they will not have the free income their parents are receiving. He pointed out that the money Chenega Corporation received from the EVOS Trustee Council and the federal government in exchange for the land deal, $34 million, amounted to roughly $0.5 million per shareholder. He said, “The government offered so much money, shareholders felt they couldn’t refuse the offer.” This respondent said that the influx of cash will have a significant impact on the community, but he did not think the loss of ownership of the land is significant. He said, “They [the land managers] are too far away to make a difference. I’ll still do whatever I would have done anyway” (Miraglia 1998b).

As of May 1999, the population of Chenega Bay was down roughly one-third from what it was prior to the oil spill. Following the tsunami, the diaspora, the re-establishment of the village, the oil spill, and all the subsequent uncertainties, the land sale further reduced residents’ connection to the land and community. It also provided disaffected residents with the money they needed to move away. None of these factors can be viewed in isolation; the effect is cumulative.

Tatitlek has been established at the present location for a much longer period of time, and the Chief and Village Council have worked hard to provide local employment and economic development. So far, most residents have remained in Tatitlek.

It is asserted by some that a shareholder in one of the village corporations died shortly after receiving the initial dividend resulting from the sale of land by his corporation. He reportedly died following a protracted spending and drinking binge. One community resident referred to this as “the first corporation murder” (Miraglia 1997).

In the mid-1990s, the EVOSTC offered to buy many Native-owned lands within the boundaries of the Kenai Fjords National Park as part of a habitat protection program (Stanek 2000). In deciding what to do with their park inholdings, the communities of Nanwalek and Port Graham took very different actions. Many residents of both villages whose ancestors once lived along the outer Kenai Peninsula coast maintained a strong affiliation with these areas, and some people were interested in using and perhaps occupying their traditional homelands. Others thought the area too remote and preferred money to spend as they wished. The expressed policy of the Port Graham Corporation, for example, was to allow settlement of many of its lands along the outer coast in Windy Bay and Rocky Bay (Norman 1997). This would enable people who once lived in those areas to have either permanent or seasonal habitations and to pursue subsistence activities. According to Norman, many people in Port Graham still remember the days and ways of living in Windy Bay, Port Chatham, and Dogfish Bay, and wish to pass on knowledge of those areas to their children. In addition, by opening a logging road from Port Graham to Windy Bay and Rocky Bay, easier access would be gained to an outer coast harbor for people who wish to travel by boat to more distant locations such as Nuka Bay, Yalik Bay, and other former settlement locations. As of mid-2000, the Port Graham Corporation had not sold its lands to the EVOS habitat program, and no negotiations were in progress.

Exactly how the lands still owned by Port Graham will be used remains to be seen. However, in the words of the late Walter Meganack Sr. (1982), "we always considered that area (the fjords) as a reserve for our future subsistence needs." For many residents of the study communities, the concept of land ownership and selling the lands used for subsistence purposes runs contrary of traditional beliefs. Mary Malchoff (1997) noted that, "people never needed to own the land they lived on, they moved about and settled in areas they needed to use. Today young people need land as collateral to get going." However, there persists the concept of "the land being there for the harvest of resources," that the Kenai Fjords lands will be there for future generations, and young people will have to learn what to do with it.

In contrast, the English Bay Corporation Board decided to sell over 32,000 acres of its park inholdings for $15 million as part of the EVOS program. In the Board's estimation, the park in-holdings were too distant and remote for any reasonable access by their shareholders, and the area should remain pristine and undeveloped (J. Kvasnikoff 1998). In addition, Corporation president Don Emmal (1997:3) stated that, "Our lands must provide for our people forever," and the step taken to do so was the placement of $500,000 from the sale in a cultural and archeological trust fund. The fund's purpose is to establish and operate a cultural resource program with the National Park Service to promote cultural resource protection, studies and interpretation of the history and artifacts within the park, and to train and employ Nanwalek youth in these activities. The remainder of the funds were to be distributed to corporation shareholders.

Although all the English Bay Corporation lands were sold fee simple, shareholders maintained subsistence rights to 6,068 acres in the vicinity of Beauty Bay and the North Arm of Nuka Bay. Rights of access to archaeological sites and artifacts have been retained for all English Bay in-holdings (U.S. Department of the Interior 1997). The Kenai Fjords National Park itself is closed to subsistence hunting and fishing, however private lands are subject to state regulations. Unique in this agreement is the reservation of trespass rights for shareholders, as noted in the following:

> …a shareholder of EBC [sic; English Bay Corporation] and such shareholder's immediate family which shareholder or immediate family maintains a primary, permanent abode on the Kenai Peninsula and such elsewhere and has permission of EBC to engage in subsistence uses on the granted lands to assist his or her immediate family meeting their nutritional and other essential needs or for the teaching or cultural knowledge to or by their immediate family;…(DOI 1997:Warranty Deed page 3)

Mishler (2001:200-204) contrasts the impacts of the "buyback" program in two Kodiak Island villages, Old Harbor and Akhiok. In May 1995 the Trustee Council purchased 31,609 acres of land from the Old Harbor Corporation for $14.5 million. These lands became part of the Kodiak National Wildlife Refuge. Mishler (2001:201) notes that:

> The urgency of this settlement was undoubtedly prompted by the downturn of commercial fish prices in the early 1990s. Old Harbor's economy is focused on commercial and subsistence fishing, and the board of directors of the Old Harbor Native Corporation is controlled by active and retired commercial fishing captains. The settlement and the subsequent distribution of corporation dividend has cushioned the loss of fishing income and has allowed boat owners to continue making payments on their vessels.
>
> The Old Harbor Native Corporation has kept most of its large buyback monies in Seattle real estate investments, paying out modest dividends to its shareholders (under $10,000/year).

According to Mishler (2001:201), the Old Harbor Corporation's decision about how to invest and distribute the proceeds from the land sales encountered little dissension among shareholders, in direct contrast to what happened at Akhiok. The Akhiok-Kaguyak Corporation sold 118,674 acres and received $42 million. The corporation president favored investing in a trust fund of stocks and bonds, but other shareholders wanted large dividend payments instead. They voted out the corporation president and went to court to win a large payout. The suit was settled out of court. Before being forced out of office, the president managed to create a trust fund with a portion of the sale funds. Mishler (2001:201) notes:

> This trust fund now pays shareholders about $500/month and the corporation also pays them about $500/month. Akhiok-Kaguyak shareholders have improved their standard of living by investing in new satellite dishes, 4-wheelers, boats, and outboard motors, but they are still feuding. As a result of these payouts, one Akhiok family has moved to Anchorage and its members have become seasonal residents, returning in the summers.

The Trustee Council's small parcel program also has had important economic effects in some villages. Case VI-1 describes these effects in Old Harbor.

Case VI-1. The Small Parcel Program in Old Harbor

The Trustee Council's small parcel buyback program was targeted at individual Native allotments, many of which are also in the Refuge. Between March 1996 and 1998, the U.S. Fish and Wildlife Service purchased 28 Native allotments, mostly from elders, and it has plans to buy several more. The funding for the small parcel program has come from a variety of sources, including the *Exxon Valdez* Oil Spill criminal restitution funds, the *Exxon Valdez* Oil Spill civil restoration funds, and Congressional appropriations from the Land and Water Conservation Fund. The parcels are largely located along the coasts of Kiliuda Bay, Sitkalidak Strait, and Three Saints Bay.

The total acreage purchased for these 28 parcels is 2,923 acres, for an average size of 104.4 acres each, and the total amount paid to allotment holders is $3.49 million, an average of $124,704 per parcel (Jerry 1998). According to an earlier estimate (Davis 1986:193), this is still only a fraction of the 215 parcels and 13,316 acres originally filed for by Old Harbor residents. This means that the majority of those with allotment parcels are still holding on to them.

The impact of this much cash, all tax free, has been quite noticeable. . . Some people have purchased new cars (referred to as "allotment cars"), new trucks, new boats, and new houses with their allotment money, while others have invested in large satellite dishes that bring in hundreds of TV channels. All of these acquisitions are an indirect result of the oil spill. . .

Unlike the situation in Akhiok, this flow of cash into Old Harbor has not created much additional tension and conflict because most of the sold allotments belonged to elders, people who were used to getting by all of their lives on very low incomes, and everyone is happy to see the elders treated well. Some allotments were jointly held by the heirs of the original allotment holders and accordingly subdivided the money within the family. And, very importantly, some of the allotment money has stayed in the community. Several villagers now benefit from jobs installing and maintaining satellite dishes and cable TV.

Source: Mishler 2001:205

SUMMARY: CONDITIONS CAUSED BY THE SPILL

Over its three phases of response, cleanup, and restoration, the EVOS created new environmental, economic, and political conditions. Some of these were, in retrospect, short-lived, while others have persisted and appear to have become part of the natural and sociopolitical landscape.

As described above, the spill initially created an atmosphere of confusion, crisis, and uncertainty. No one could say what the long-term effects of the 11 million gallons of oil would be on the natural environment. Studies to determine these effects were cloaked in secrecy and clouded by litigation. The result was competing claims that were still not resolved ten years after the event.

The combination of natural resource injuries and uncertainty created doubt and distrust for the many families whose food supply and way of life depend upon subsistence fishing, hunting, and gathering. Both industry and government were unprepared to provide answers to those whose observations and traditional knowledge urged caution about the safety of eating subsistence foods. Thus confidence in subsistence resources and the ability to enact associated social and cultural processes were undermined.

The spill also brought short and long-term changes to the local economies of Pacific Gulf communities. The future of commercial fishing was threatened. But large amounts of cash entered the local economy in 1989 through cleanup jobs. Of more lasting consequence, the restoration phase brought money into communities through research and enhancement programs, and projects to enhance community infrastructure and educational and cultural institutions. The habitat protection program also resulted in Native corporations receiving large restoration fund payments.

Additionally, the political environment changed. The restoration program created a powerful new entity, the EVOS Trustee Council, with which local communities interacted and negotiated. One consequence was pressure to sell Native land. This led to social disruptions and the potential loss of political and economic influence. Another consequence was opportunity to tap into restoration funds for a variety of natural resource and sociocultural programs. This was difficult once the court rejected the Native claim against Exxon for cultural damages. Alaska Native communities needed to convince state and federal bureaucracies that they should be part of the “ecological approach” to restoration within their own homelands. The next two chapters will describe how the communities and households of the spill region adapted to these conditions and uncertainties.

Chapter Seven: Economic and Sociocultural Effects of the *Exxon Valdez* Oil Spill on Resident Human Groups - I

The *Exxon Valdez Oil Spill* set in motion the wheels of industry and government at the highest levels. Huge and costly programs were instituted for cleanup, restoration, and damage settlement, as described in Chapter Six. At the same time, the oil spill set in motion activities at a local, more personal level. Resident human groups near the spill area were compelled to action by the industrial failure. It was near the spill area itself that human groups were most directly and immediately affected by the drifting oil, oiled coastlines, disrupted fisheries, and contaminated foods.

In the next two chapters, the responses of resident human groups in the spill area are described. The primary focus of this chapter is on how household-level groups adapted to events and conditions triggered by the oil spill. Caught in an unfolding disaster, families nearest the spill area had to make quick, personal decisions regarding where to be, what to do, and what to eat. These decisions potentially held long-lasting consequences for the health and well-being of family members. No one was specifically prepared for these decisions. There had been no preparatory training in how families and villages should respond to an oil spill. Forced by circumstance, families and local governments made hard choices about how to deal with unforeseen and difficult events. As will be shown in the next two chapters, overall, residents actively responded to the industrial disaster in ways that protected the well-being of family members and that preserved traditional social and cultural elements of community life.

Chapters Seven and Eight examine responses related to several important spheres of community life – wild food harvests, commercial-wage employment, sharing of wild foods, child socialization, and roles of elders. Responses are described over the course of events, from the first frantic spill year through ten successive post-spill years of uncertainty, litigation, recovery, and restoration. The magnitude and kind of response relate to the proximity of communities to the spill center. While some comparative information on towns and cities are provided, the chapter focuses on households in the Alutiiq villages of the Pacific Gulf. Information in this chapter is generally presented at the community level. That is, the measured effects are averaged across all households in a community. In the next chapter, more details about certain effects are provided by type of households and type of communities. Certain findings on changes in wild food harvests and uses have been discussed in detail elsewhere (Fall and Field 1996; Fall and Utermohle 1995; Fall and Utermohle 1999; Fall 1999a, 1999c). Because of this, this chapter synthesizes key findings, primarily with a series of figures and tables. As discussed in Chapter One, systematic interviewing took place in a sample of communities for the first five post-spill years (1989 through 1993), summarized in Fall and Utermohle (1995). Another round of interviews occurred in eight communities in September 1998 for what we have called in this report “the tenth post-spill year” (Fall and Utermohle 1999).

WILD FOOD HARVEST AND USE PATTERNS, THE FIRST POST-SPILL YEAR

“No one’s eating anything out of the ocean anymore”
-- Ouzinkie, June 1989

The production, distribution, and consumption of wild foods by household-level groups were defining characteristics of the mixed subsistence-cash economy of Alutiiq villages prior to the oil spill (see Chapter Five). Wild foods provided a major portion of the nutritional requirements of Pacific Gulf communities. The annual mean harvest in villages (about 316 pounds per person) supplied about 204 percent of protein requirements and 29 percent of energy (kcal) requirements. As described in Chapter Five, this part of the village economy (the “subsistence sector”) exists alongside of and is integrated with the production of goods and services for income (the “commercial-wage sector”). Production and distribution of wild foods for local consumption were the domain of households and extended household groups (called a “domestic mode” of economic organization, because household groups are the main economic firms). Through impacts on the economic activities of household-level groups, the oil spill had direct effects on the subsistence sector of the village economy.

The *Exxon Valdez* oil spill had profound impacts on how households produced, distributed, and shared wild foods in Alutiiq villages nearest the spill (Fall and Field 1996; Fall and Utermohle 1995; Fall and Utermohle 1999; Fall 1999a). During the year following the spill, the volume of wild food harvests in ten Alutiiq villages of Prince William Sound, Lower Cook Inlet, and Kodiak Island declined substantially. Counting all wild foods, subsistence harvests declined 56.9 percent in Prince William Sound, 48.3 percent in Lower Cook Inlet, and 49.9 percent on Kodiak Island (Fig. VII-1, Table VII-1). By community, harvests declined from 77 percent (Ouzinkie) to 9 percent (Akhiok) (Fig. VII-2). In the spill area excluding the Alaska Peninsula, subsistence harvest quantities declined by more than half (51.1 percent) compared with pre-spill levels. The magnitude of effects on wild food harvests was related to the distance of the village from the spill center. By virtue of distance and timing over the course of 1989, wild food production was not measurably affected in Alutiiq villages of the Alaska Peninsula more distant from the spill center. During the first post-spill year, subsistence harvests were relatively stable in four of the five Alaska Peninsula villages and increased in the fifth village (Chignik Lake) because of an increased caribou harvest. Overall, wild food harvests were 20.7 percent greater over pre-spill levels in Alaska Peninsula villages. Even here, however, there were disruptions to particular activities such as marine invertebrate gathering, salmon fishing, and bird hunting. Resources suspected of contamination were discarded (Fall et al. 1995:213).

Changes in the average number of subsistence resources used, harvested, received, and shared mirrored those of harvest quantities in the first post-spill year both at the community level and the subregional level (Tables VII-2 through VII-5; Figures VII-3 through VII-12). During the year after the spill, a more narrow range of resources was used by households (Fig. VII-3 and VII-4). Households attempted to harvest a smaller set of species (Fig. VII-5 and VII-6). The numbers of different kinds of wild foods

Table VII-1. Changes in Characteristics of Subsistence Uses by Subregion, Spill Year (1989) Compared to Pre-Spill Averages

Characteristic Region	Pre-Spill Average	Post-Spill Year	Change
Per Capita harvests (pounds)			
Prince William Sound	436.5	188.3	-56.9%
Lower Cook Inlet	254.3	131.4	-48.3%
Kodiak Island Borough	392.1	196.3	-49.9%
Alaska Peninsula (AKP)	287.0	346.4	20.7%
All Regions	352.0	218.2	-38.0%
All Regions, except AKP	370.5	181.1	-51.1%
Average number of resources used per household			
Prince William Sound	19.0	9.0	-52.6%
Lower Cook Inlet	22.9	12.2	-46.7%
Kodiak Island Borough	15.4	11.2	-27.3%
Alaska Peninsula (AKP)	15.7	17.6	12.1%
All Regions	16.9	12.5	-26.0%
All Regions, except AKP	17.2	11.2	-34.9%
Average number of resources attempted to harvest per household			
Prince William Sound	12.5	5.7	-54.4%
Lower Cook Inlet	16.1	9.2	-42.9%
Kodiak Island Borough	11.8	7.9	-33.1%
Alaska Peninsula (AKP)	10.3	12.3	19.4%
All Regions	12.3	8.9	-27.6%
All Regions, except AKP	12.7	8.0	-37.0%
Average number of resources harvested per household			
Prince William Sound	11.5	5.2	-55.0%
Lower Cook Inlet	15.4	8.6	-44.2%
Kodiak Island Borough	11.5	7.6	-33.7%
Alaska Peninsula (AKP)	9.8	11.4	16.9%
All Regions	11.8	8.4	-29.0%
All Regions, except AKP	12.3	7.6	-38.3%
Average number of resources received per household			
Prince William Sound	11.3	4.8	-57.5%
Lower Cook Inlet	12.3	6.6	-46.3%
Kodiak Island Borough	6.6	5.5	-16.7%
Alaska Peninsula (AKP)	9.1	9.8	7.7%
All Regions	8.3	6.5	-21.7%
All Regions, except AKP	8.1	5.6	-30.9%
Average number of resources given away per household			
Prince William Sound	9.1	4.0	-56.2%
Lower Cook Inlet	8.1	5.5	-31.8%
Kodiak Island Borough	4.5	4.3	-4.2%
Alaska Peninsula (AKP)	5.8	6.7	17.0%
All Regions	5.6	5.0	-10.8%
All Regions, except AKP	5.6	4.6	-18.6%

Source: ADF&G 2001 and Division of Subsistence, ADF&G, Household Surveys

Figure VII-1. Changes in Subsistence Harvests, Spill Year (1989) Compared to Pre-spill Averages, by Sub-Region

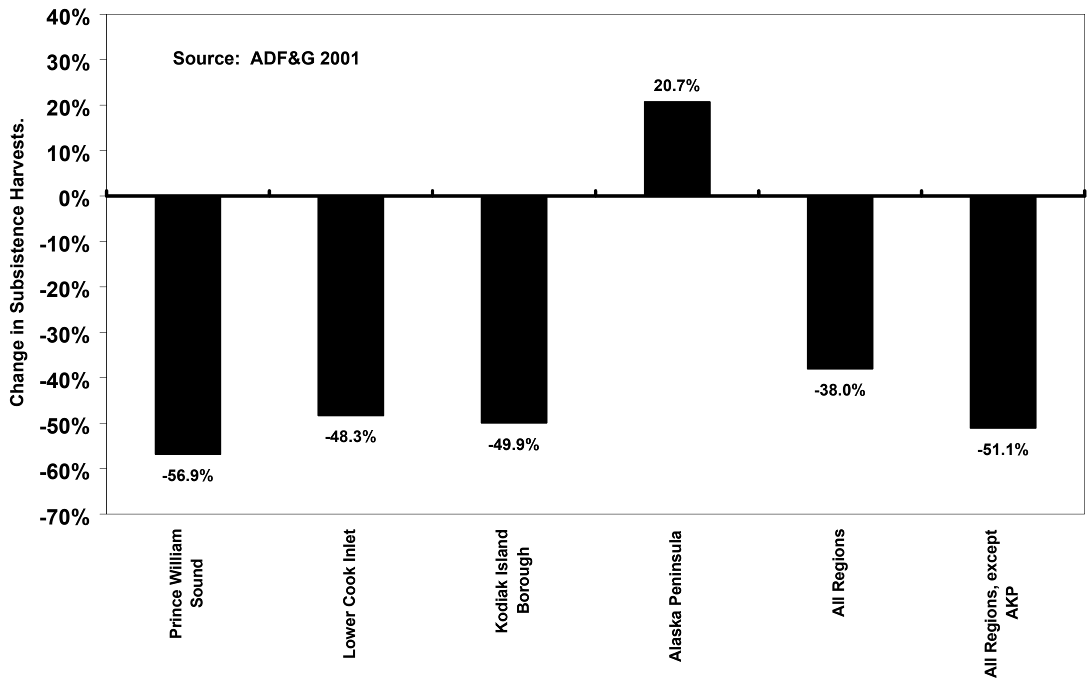


Figure VII-2. Changes in Subsistence Harvests after the *Exxon Valdez* Oil Spill, 15 Study Communities of the Oil Spill Area

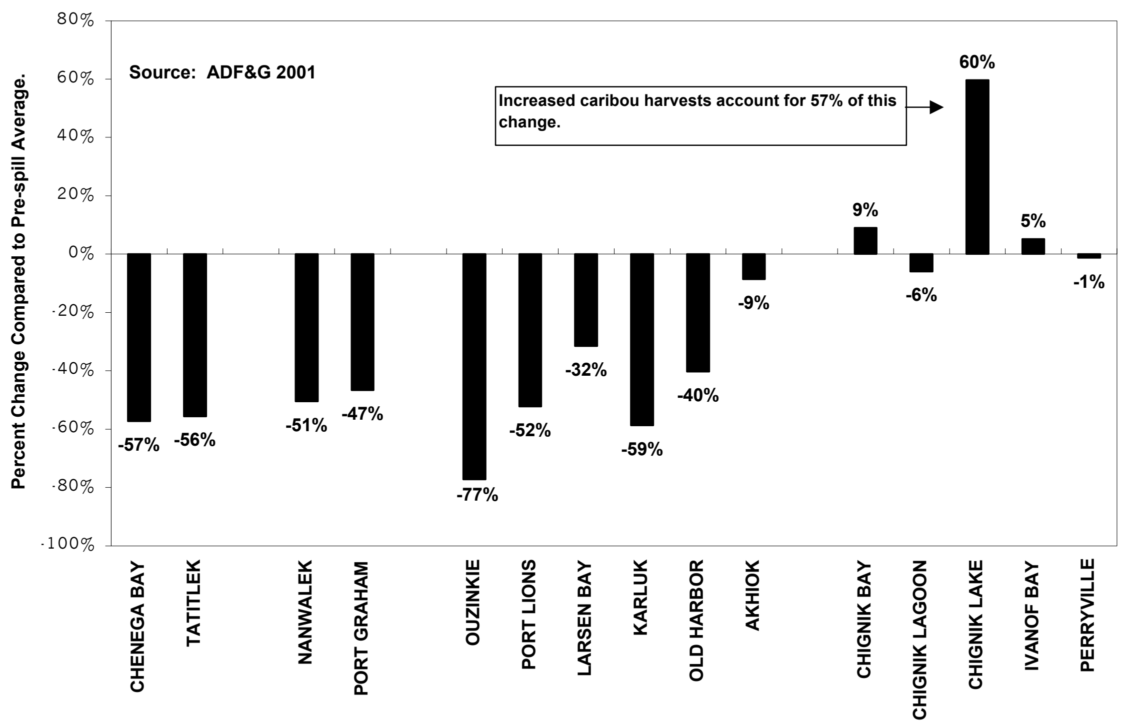


Table VII-2. Subsistence Harvests in Pounds Usable Weight per Person, Oil Spill Area Alaska Native Villages[1]

	Pre-spill Harvests, Lbs. per Capita			Post-spill Harvests, Lbs. per Capita					
Community	Year One[2]	Year Two[3]	Prespill Value[4]	1989 (Spill Year)	1990	1991	1992	1993	1998
Chenega Bay	316.4	375.1	346.6	148.3	139.2	343.9	412.5	274.8	576.9
Tatitlek	352.5	643.5	483.4	214.8	152.7	346.0	308.0	270.1	406.4
Prince William Sound	341.2	543.1	436.5	188.3	147.5	345.1	357.1	272.5	478.1
Nanwalek	284.7		284.7	140.9	181.3	258.8	279.0	304.9	253.9
Port Graham	228.8		228.8	122.2	214.0	280.4	272.8	212.1	253.4
Lower Cook Inlet	254.3		254.3	131.4	196.7	269.6	275.9	253.6	253.7
Akhiok	519.5	162.4	325.9	297.7	305.5	313.3	321.1	321.1	321.1
Karluk	863.1	385.2	618.1	254.9	401.5	268.7	268.7	268.7	268.7
Larsen Bay	403.5	210.7	309.5	212.0	344.5	294.6	353.2	451.0	370.5
Old Harbor	489.4	425.4	456.3	272.3	331.6	390.9			300.4
Ouzinkie	376.1	404.8	389.3	88.9	205.2	209.4	347.1	218.2	264.0
Port Lions	279.8	333.9	307.2	146.7	192.9	239.1	285.3	331.5	331.5
Kodiak Island Borough	441.2	343.5	392.1	196.3	280.8	285.7	328.7	315.4	308.3
Chignik Bay	187.9		187.9	208.9	281.1	353.4			
Chignik Lagoon	220.3		220.3	211.4	211.4	211.4			
Chignik Lake	279.0		279.0	453.0	447.6	442.3			
Ivanof Bay	455.7		455.7	489.9	489.9	489.9			
Perryville	391.1		391.1	394.4	394.4	394.4			
Alaska Peninsula	287.0		287.0	346.4	366.5	386.6			
All Communities	371.8	332.1	352.0	218.2	271.1	312.9			
All Communities, w/o Alaska Peninsula[5]	395.9	345.0	370.5	181.1	243.4	289.9	320.3	297.1	312.4

1 Because not all communities were surveyed in every study year, missing values were interpolated based upon the trend for known values and held constant for years subsequent to the final study year.

2 Equals 1984/85 for Chenega Bay, 1987/88 for Tatitlek, 1982/83 for Kodiak Island Borough, and 1984 for Alaska Peninsula.

3 Equals 1985/86 for Chenega Bay, 1988/89 for Tatitlek, and 1986 for Kodiak Island Borough. Otherwise, Year One values used to calculate regional average.

4 Equals average of previous estimates if two pre-spill study years available; otherwise, equals single pre-spill estimate.

5 Because post-spill changes were small in Alaska Peninsula villages and no surveys were done there after 1991, this row may best depict spill effects.

Table VII-3. Average Number of Resources Used per Household, Oil Spill Region Study Communities[1]

Community	Pre-spill Average No. Used per HH: Year One[2]	Year Two[3]	Prespill Value[4]	Post-spill: Average Number of Resources Used per Household: 1989 (Spill Year)	1990	1991	1992	1993	1998
Chenega Bay	16.9	20.6	18.8	7.2	9.8	13.2	17.7	15.0	21.3
Tatitlek	17.9	20.5	19.1	10.3	12.5	17.3	17.2	17.1	16.9
Prince William Sound	17.6	20.5	19.0	9.0	11.3	15.5	17.4	16.0	18.8
Nanwalek	25.0		25.0	13.7	22.4	21.2	22.9	22.7	21.5
Port Graham	21.5		21.5	11.2	17.4	22.0	22.1	19.4	16.5
Lower Cook Inlet	22.9		22.9	12.2	19.5	21.6	22.4	20.6	18.3
Akhiok	18.5	7.9	12.6	18.0	17.3	16.7	16.0	16.0	16.0
Karluk	20.9	13.2	17.0	10.9	13.2	13.5	13.5	13.5	13.5
Larsen Bay	18.1	13.2	15.4	12.7	16.5	15.4	14.1	14.7	8.6
Old Harbor	18.3	12.8	15.2	13.6	15.2	16.7	17.1	17.4	17.7
Ouzinkie	20.4	16.0	18.3	7.6	13.9	15.2	15.8	12.7	15.1
Port Lions	15.7	12.3	14.0	9.4	11.0	12.5	14.1	15.6	15.6
Kodiak Island Borough	18.2	12.8	15.4	11.2	14.1	14.9	15.3	15.2	15.0
Chignik Bay	12.5		12.5	14.6	14.7	14.7			
Chignik Lagoon	10.7		10.7	13.6	13.6	13.6			
Chignik Lake	16.0		16.0	19.0	20.2	21.4			
Ivanof Bay	18.8		18.8	26.9	26.9	26.9			
Perryville	21.6		21.6	19.9	19.9	19.9			
Alaska Peninsula	15.7		15.7	17.6	17.9	18.2			
All Communities	18.5		16.9	12.5	15.6	16.9			
All Communities, w/o Alaska Peninsula[5]	19.1	15.4	17.2	11.2	15.0	16.5	17.2	16.4	16.2

[1] Because not all communities were surveyed in every study year, missing values were interpolated based upon the trend for known values and held constant for years subsequent to the final study year.
[2] Equals 1984/85 for Chenega Bay, 1987/88 for Tatitlek, 1982/83 for Kodiak Island Borough, and 1984 for Alaska Peninsula.
[3] Equals 1985/86 for Chenega Bay, 1988/89 for Tatitlek, and 1986 for Kodiak Island Borough. Otherwise, Year One values used to calculate regional average.
[4] Equals average of previous estimates if two pre-spill study years available; otherwise, equals single pre-spill estimate.
[5] Because post-spill changes were small in Alaska Peninsula villages and no surveys were done there after 1991, this row may best depict spill effects.

Table VII-4. Average Number of Resources Attempted to Harvest per Household, Oil Spill Region Communities[1]

Community	Pre-Spill Average No. Attempted per HH			Post-spill: Average Number of Resources Attempted per Household					
	Year One[2]	Year Two[3]	Prespill Value[4]	1989 (Spill Year)	1990	1991	1992	1993	1998
Chenega Bay	12.6	15.4	14.1	5.1	6.2	9.6	10.4	10.2	18.2
Tatitlek	11.1	12.3	11.7	6.2	8.4	13.1	12.6	12.2	13.3
Prince William Sound	11.6	13.5	12.5	5.7	7.5	11.5	11.5	11.2	15.5
Nanwalek	18.0	18.0	18.0	10.5	15.4	14.9	17.7	16.8	16.0
Port Graham	14.9	14.9	14.9	8.3	12.1	14.7	14.8	11.6	10.1
Lower Cook Inlet	16.1	16.1	16.1	9.2	13.5	14.8	15.6	13.5	12.3
Akhiok	18.0	6.8	11.8	14.2	13.4	12.6	11.8	11.8	11.8
Karluk	15.3	8.0	11.6	8.3	9.2	10.5	10.5	10.5	10.5
Larsen Bay	11.9	7.3	9.4	7.9	10.4	9.8	10.1	9.4	6.8
Old Harbor	16.3	9.8	12.7	9.5	10.0	10.6	10.9	11.1	11.3
Ouzinkie	15.3	12.7	14.0	5.7	9.5	11.1	11.1	8.8	11.6
Port Lions	11.4	9.6	10.5	6.8	7.6	8.3	8.9	9.6	9.6
Kodiak Island Borough	14.3	9.5	11.8	7.9	9.5	10.1	10.4	10.0	10.3
Chignik Bay	8.4	8.4	8.4	10.9	10.1	9.4			
Chignik Lagoon	6.9	6.9	6.9	7.8	7.8	7.8			
Chignik Lake	9.4	9.4	9.4	13.1	12.8	12.7			
Ivanof Bay	15.2	15.2	15.2	22.3	22.3	22.3			
Perryville	14.1	14.1	14.1	13.4	13.4	13.4			
Alaska Peninsula	10.3	10.3	10.3	12.3	12.0	11.7			
All Communities	13.7	11.0	12.3	8.9	10.6	11.4			
All Communities, w/o Alaska Peninsula	14.5	11.1	12.7	8.0	10.2	11.4	11.7	10.9	11.3

[1] Because not all communities were surveyed in every study year, missing values were interpolated based upon the trend for known values and held constant for years subsequent to the final study year.
[2] Equals 1984/85 for Chenega Bay, 1987/88 for Tatitlek, 1982/83 for Kodiak Island Borough, and 1984 for Alaska Peninsula.
[3] Equals 1985/86 for Chenega Bay, 1988/89 for Tatitlek, and 1986 for Kodiak Island Borough. Otherwise, Year One values used to calculate regional average.
[4] Equals average of previous estimates if two pre-spill study years available; otherwise, equals single pre-spill estimate.
[5] Because post-spill changes were small in Alaska Peninsula villages and no surveys were done there after 1991, this row may best depict spill effects.

Table VII-5. Average Number of Resources Received per Household, Oil Spill Region Study Comunnities[1]

Community	Pre-Spill Average No. Received per HH: Year One[2]	Year Two[3]	Prespill Value[4]	Post-spill: Average Number of Resources Received per Household: 1989 (Spill Year)	1990	1991	1992	1993	1998
Chenega Bay	10.4	9.2	9.8	3.5	5.4	8.0	13.0	10.3	15.1
Tatitlek	11.7	12.7	12.2	5.8	7.1	11.9	12.0	12.1	9.8
Prince William Sound	11.2	11.4	11.3	4.8	6.4	10.1	12.5	11.2	12.1
Nanwalek	15.1	15.1	15.1	6.9	13.1	12.8	14.1	13.5	14.3
Port Graham	10.6	10.6	10.6	6.4	9.3	13.4	14.0	13.0	10.3
Lower Cook Inlet	12.3	12.3	12.3	6.6	10.9	13.1	14.0	13.2	11.8
Akhiok	1.7	1.7	1.7	8.6	8.3	8.0	7.8	7.8	7.8
Karluk	6.6	6.6	6.6	5.4	8.4	8.7	8.7	8.7	8.7
Larsen Bay	8.4	8.4	8.4	6.6	10.5	8.8	7.0	8.9	4.0
Old Harbor	7.3	7.3	7.3	7.4	9.1	10.7	9.8	9.0	8.3
Ouzinkie	7.9	7.9	7.9	3.2	6.7	7.4	7.9	6.8	7.3
Port Lions	5.6	5.6	5.6	3.8	4.2	4.5	4.8	5.1	5.1
Kodiak Island Borough	6.6	6.6	6.6	5.5	7.5	7.8	7.5	7.4	6.6
Chignik Bay	7.1	7.1	7.1	6.8	7.8	8.7			
Chignik Lagoon	5.2	5.2	5.2	8.2	8.2	8.2			
Chignik Lake	10.1	10.1	10.1	10.6	12.3	14.1			
Ivanof Bay	9.0	9.0	9.0	16.0	16.0	16.0			
Perryville	13.4	13.4	13.4	12.1	12.1	12.1			
Alaska Peninsula	9.1	9.1	9.1	9.8	10.5	11.2			
All Communities	8.3	8.3	8.3	6.5	8.7	9.8			
All Communities, w/o Alaska Peninsula[5]	8.1	8.1	8.1	5.6	8.1	9.3	9.6	9.1	8.4

[1] Because not all communities were surveyed in every study year, missing values were interpolated based upon the trend for known values and held constant for years subsequent to the final study year.
[2] Equals 1984/85 for Chenega Bay, 1987/88 for Tatitlek, and 1984 for Alaska Peninsula. Data not collected for Kodiak Island Borough for Year One (1982/83).
[3] Equals 1985/86 for Chenega Bay, 1988/89 for Tatitlek, and 1986 for Kodiak Island Borough. Otherwise, Year One values used to calculate regional average.
[4] Equals average of previous estimates if two pre-spill study years available; otherwise, equals single pre-spill estimate.
[5] Because post-spill changes were small in Alaska Peninsula villages and no surveys were done there after 1991, this row may best depict spill effects.

Figure VII-3. Changes in Average Number of Resources Used per Household, Post-Spill Year (1989) Compared to Pre-Spill Averages

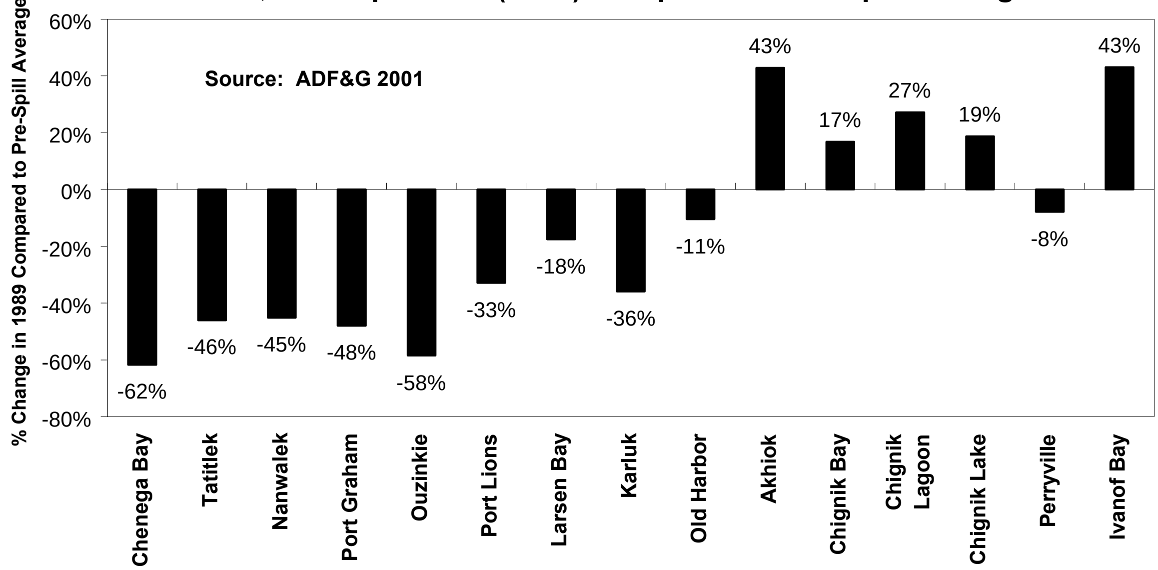


Figure VII- 4. Changes in Average Number of Subsistence Resources Used per Household, Spill Year (1989) Compared to Pre-spill Averages, by Subregion

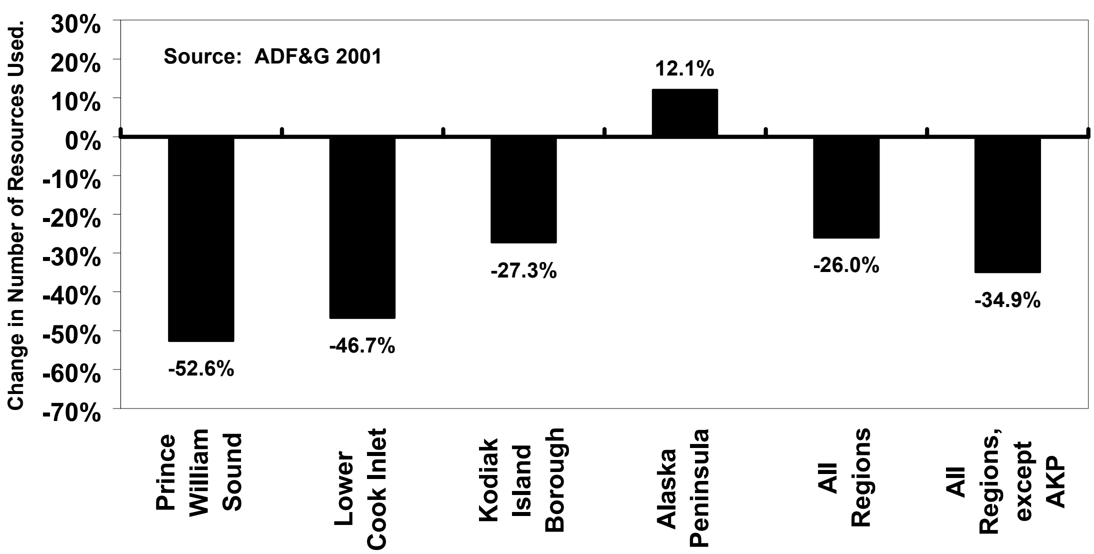


Figure VII-5. Changes in Average Number of Resources Attempted to Harvest per Household, Post-Spill Year (1989) Compared to Pre-Spill Averages

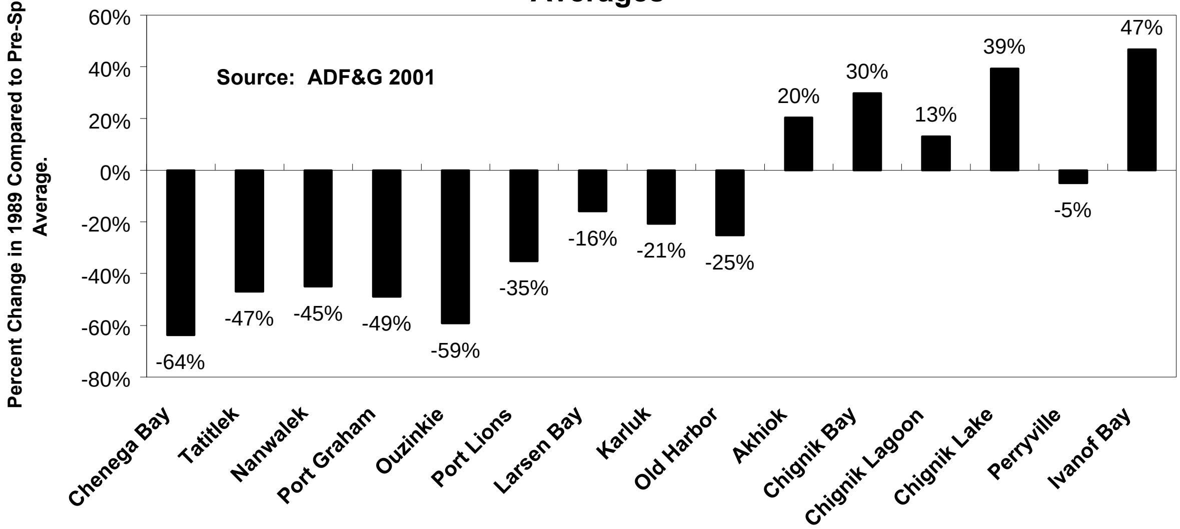


Figure VII-6. Changes in Average Number of Subsistence Resources Attempted to Harvest per Household, Spill Year (1989) Compared to Pre-spill Averages, by Subregion

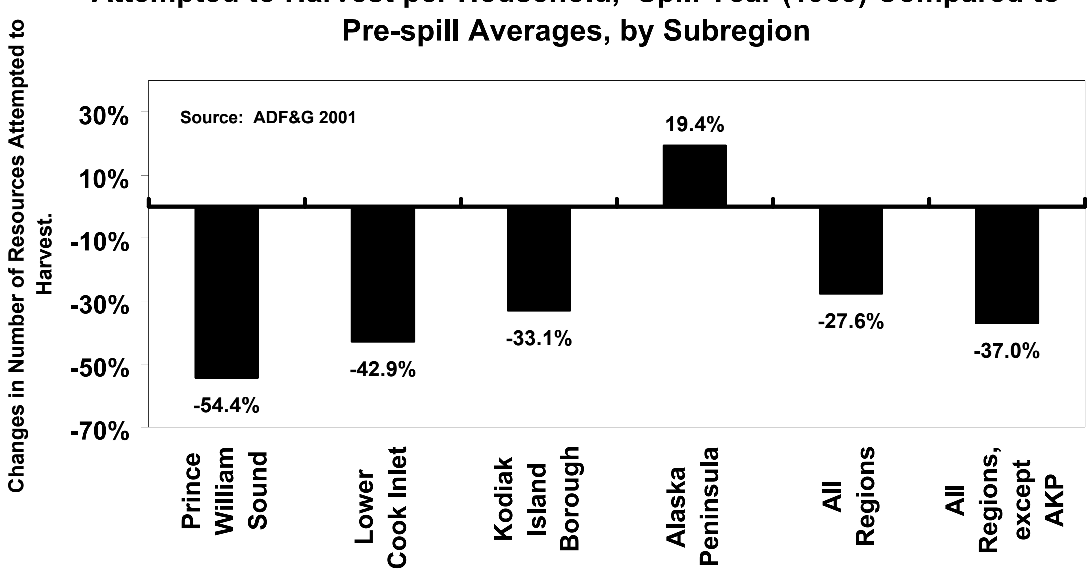


Figure VII-7. Changes in Average Number of Resources Harvested per Household, Post-Spill Year (1989) Compared to Pre-Spill Averages

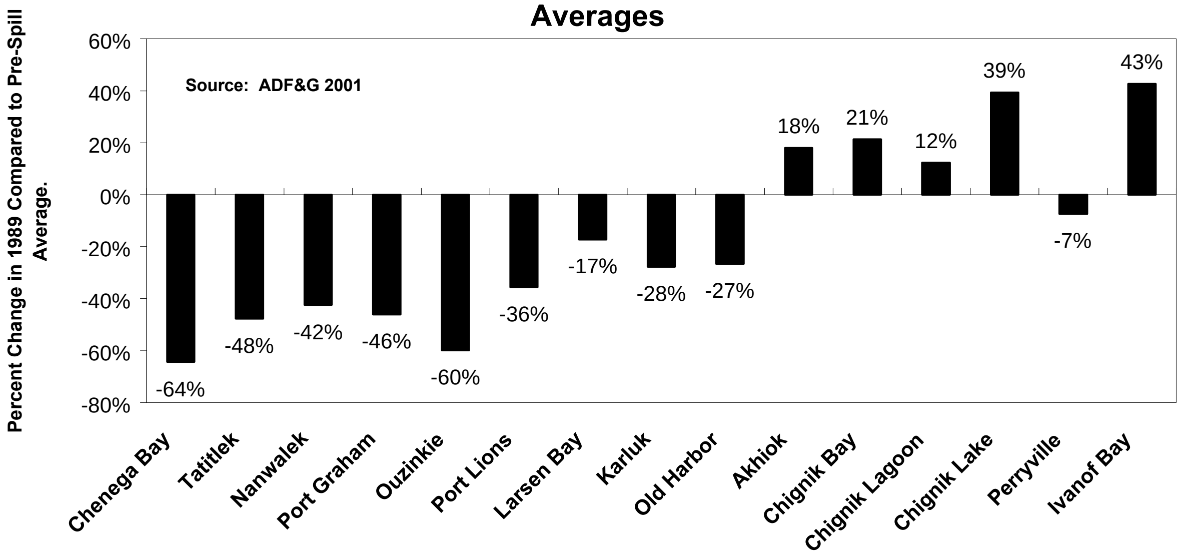


Figure VII-8. Changes in Average Number of Subsistence Resources Harvested per Household, Spill Year (1989) Compared to Pre-spill Averages, by Subregion

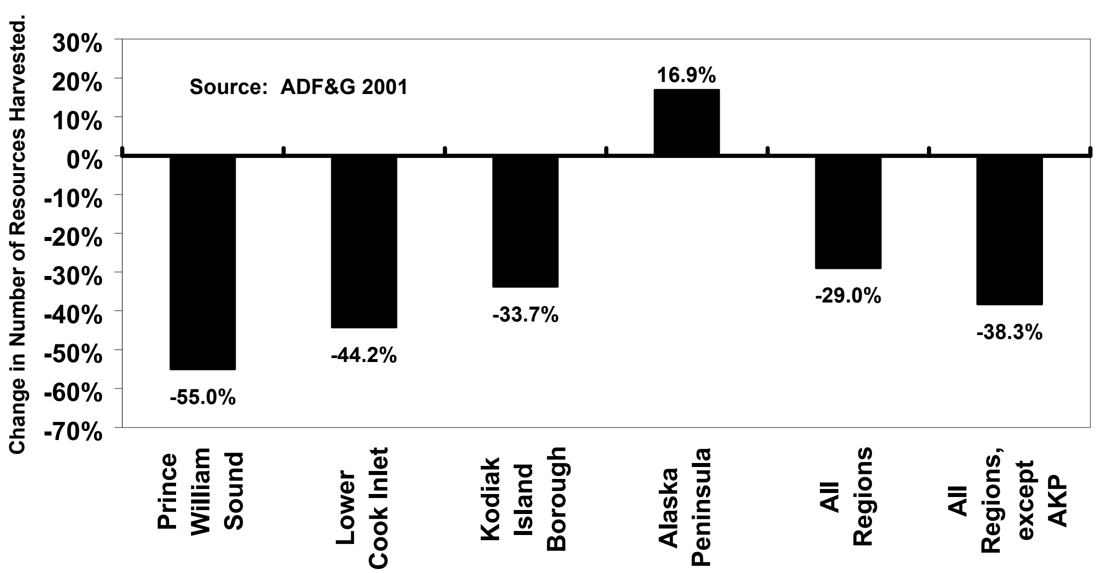


Figure VII-9. Changes in Average Number of Resources Received per Household, Post-Spill Year (1989) Compared to Pre-Spill Averages

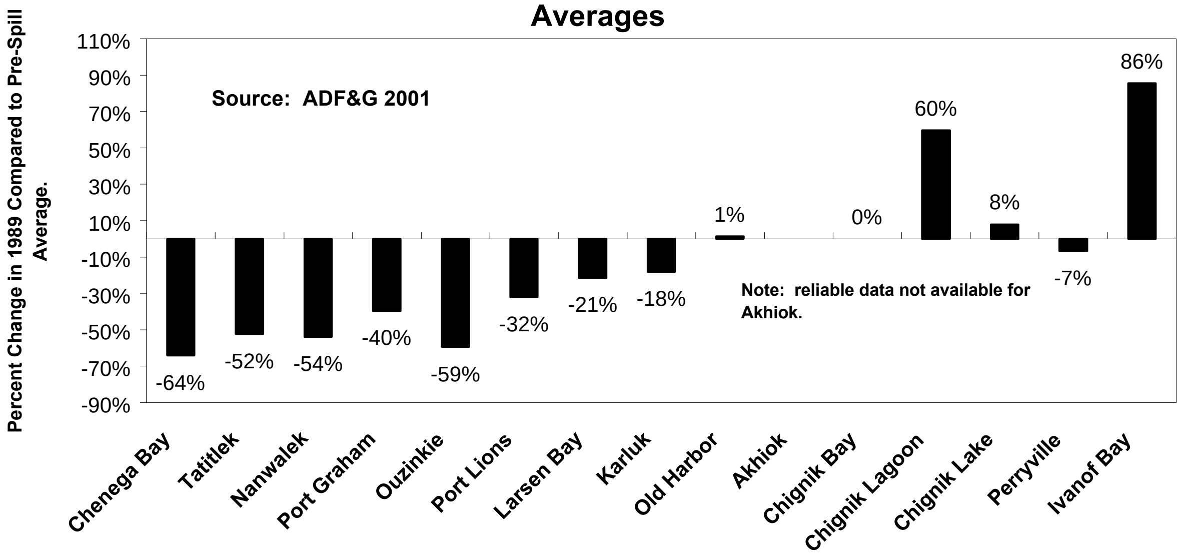


Figure VII-10. Changes in Average Number of Subsistence Resources Received per Household, Spill Year (1989) Compared to Pre-spill Averages, by Subregion

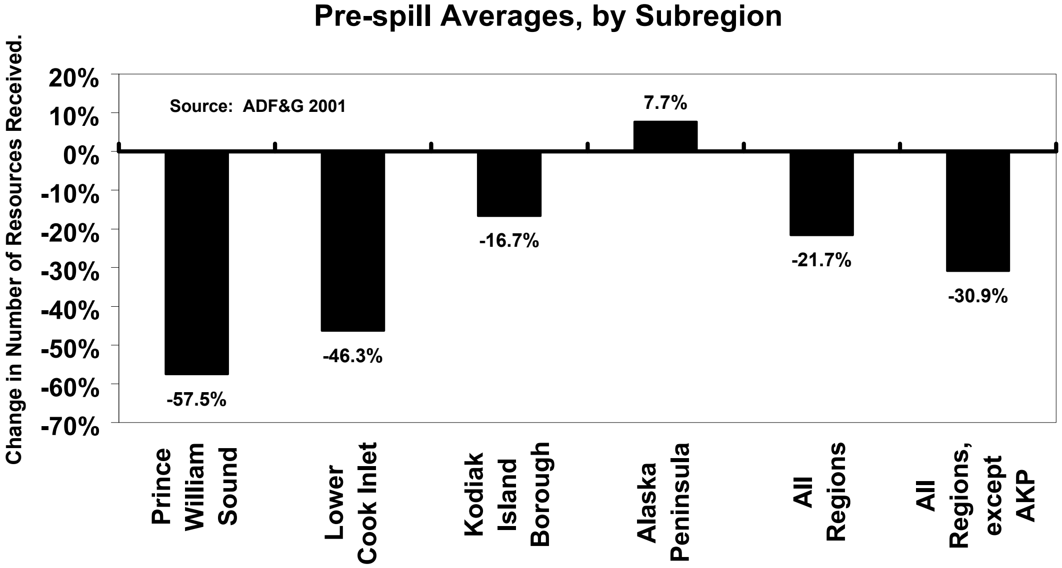


Figure VII-11. Changes in Average Number of Resources Gave Away per Household, Post-Spill Year (1989) Compared to Pre-Spill Averages

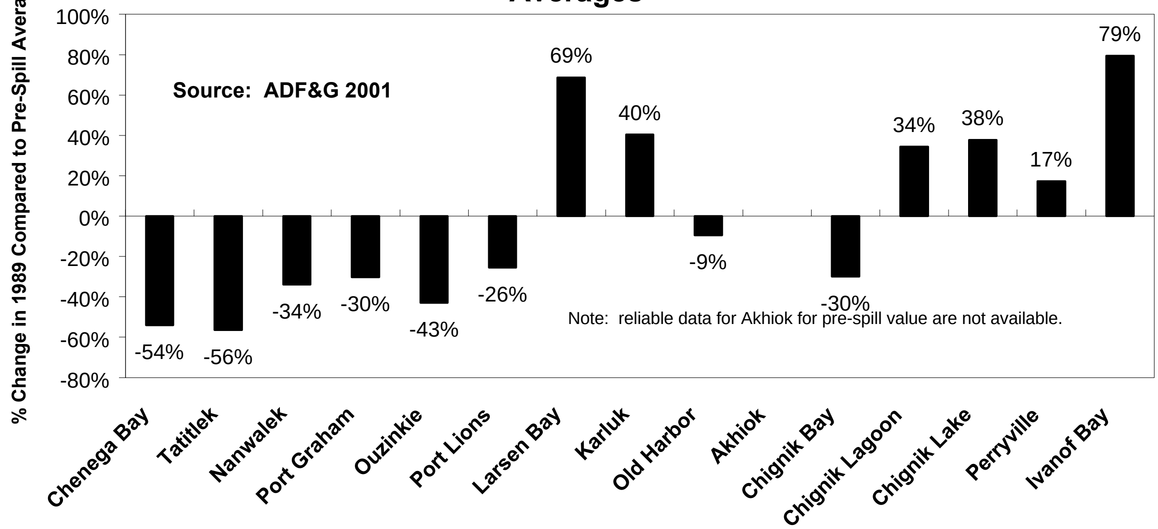
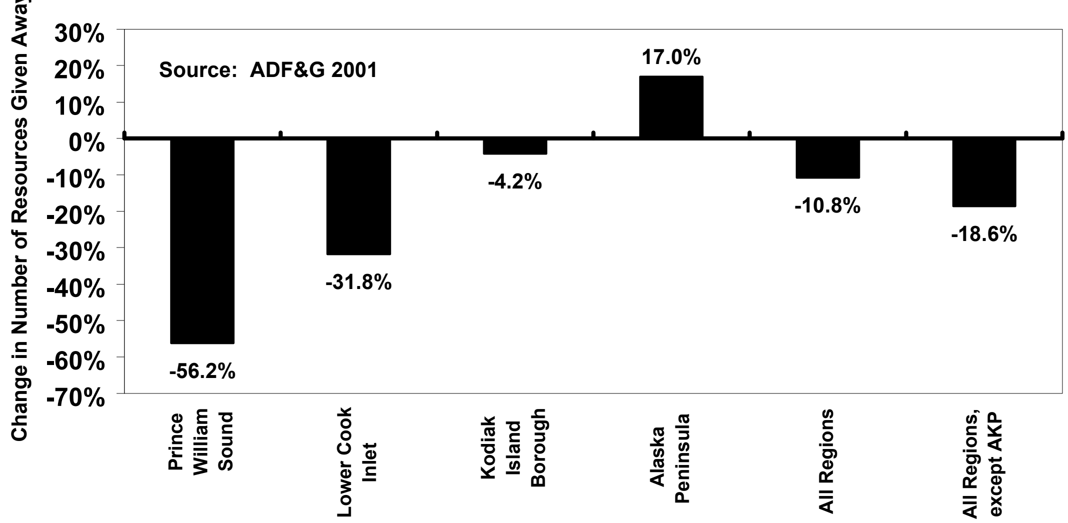


Figure VII-12. Changes in Average Number of Subsistence Resources Given Away per Household, Spill Year (1989) Compared to Pre-spill Averages, by Subregion



harvested by households was substantially less (Fig. VII-7 and VII-8). And the giving and receiving of wild foods among households were markedly reduced (Figs. VII-9 through VII-12).

EXPLANATIONS FOR SUBSISTENCE DECLINES, FIRST POST-SPILL YEAR

The marked declines in production, distribution, and consumption of wild foods were primarily due to oil spill factors. As shown in Figure VII-13, a large majority of households (over 60 percent) in Chenega Bay, Tatitlek, Nanwalek, Port Graham, and Ouzinkie said their subsistence food harvests fell because of the oil spill. About half the households in Port Lions, Larsen Bay, Karluk, Chignik Lagoon, and Ivanof Bay provided this same assessment. Figure VII-14 provides household assessments of whether there was a decline in any subsistence use in 1989 and whether the cause was spill-related. Notable again is the strong attribution of cause, especially in communities close to the spill.

In Alutiiq villages nearest the spill, concern about wild food contamination by oil was by far the most prevalent explanation given by surveyed households for the marked declines in subsistence activities. This was also true for all subregions. Figure VII-15 illustrates the frequency of various explanations offered for changes in overall subsistence resource harvests in 1989. In Lower Cook Inlet, many households also identified oil spill cleanup work as a reason for lower subsistence harvests and uses during 1989. Some households also voiced concerns about reduced populations of wildlife due to oil-induced mortality and reported that they did not hunt as a conservation measure. Case VII-1 provides a sampling of statements made by village residents regarding their concerns about subsistence food contamination and damages to resource populations in 1989.

Figure VII-16 displays the geographic pattern of subsistence resource contamination concerns in 1989. For both subsistence harvests overall and any particular resource, contamination concerns in 1989 were expressed most frequently in the Prince William Sound and Lower Cook Inlet villages nearest the spill. About two-thirds of all households in these areas reportedly had lower overall subsistence uses, and over three-quarters of all households reduced uses of at least one wild food resource due to food safety issues. The level of concern about food safety was intermediate for households in Alutiiq villages on Kodiak Island, located farther from the spill. Households in Alutiiq villages of the Alaska Peninsula reported the lowest level of food safety concerns, as well as the fewest negative effects on wild food uses.

These findings are consistent with findings from other studies that documented qualitative reports of declines in subsistence uses in the year after the oil spill. The “Oiled Mayors” study, for instance, found that declines in subsistence activities were related to the degree of exposure of the respondent to the spill and cleanup activities, supporting the dose-response hypothesis (Impact Assessment, Inc. 1990d: 17,50-60). As shown in Figure VII-17, respondents in the “high-exposed” group reported substantial reductions in time spent in subsistence activities, sharing of resources, the number of people involved in subsistence, and involvement of children in subsistence. Respondents in the “low-exposed”

Figure VII-13. Percentage of Households Reporting Lower Overall Subsistence Harvests in the Year Following the *Exxon Valdez* Oil Spill

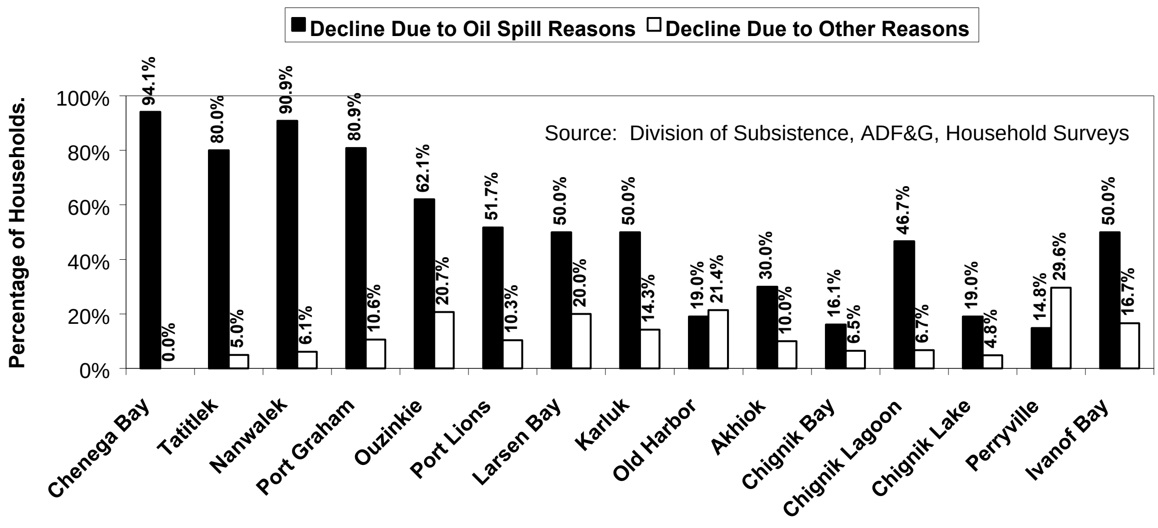
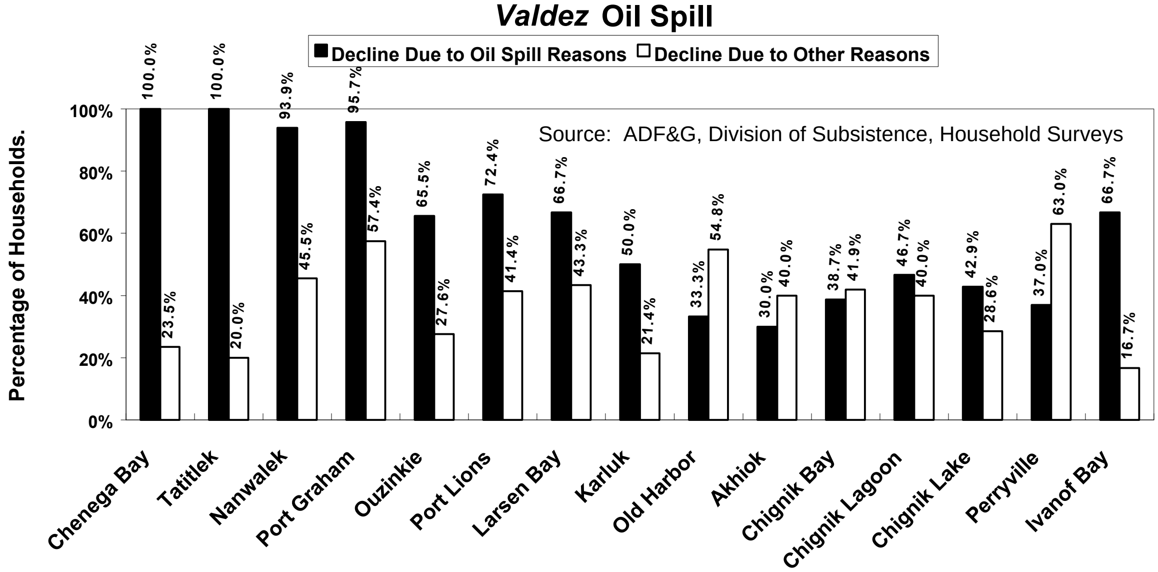


Figure VII-14. Percentage of Households Reporting a Decline in Any Subsistence Resource Harvest in the Year Following the *Exxon Valdez* Oil Spill



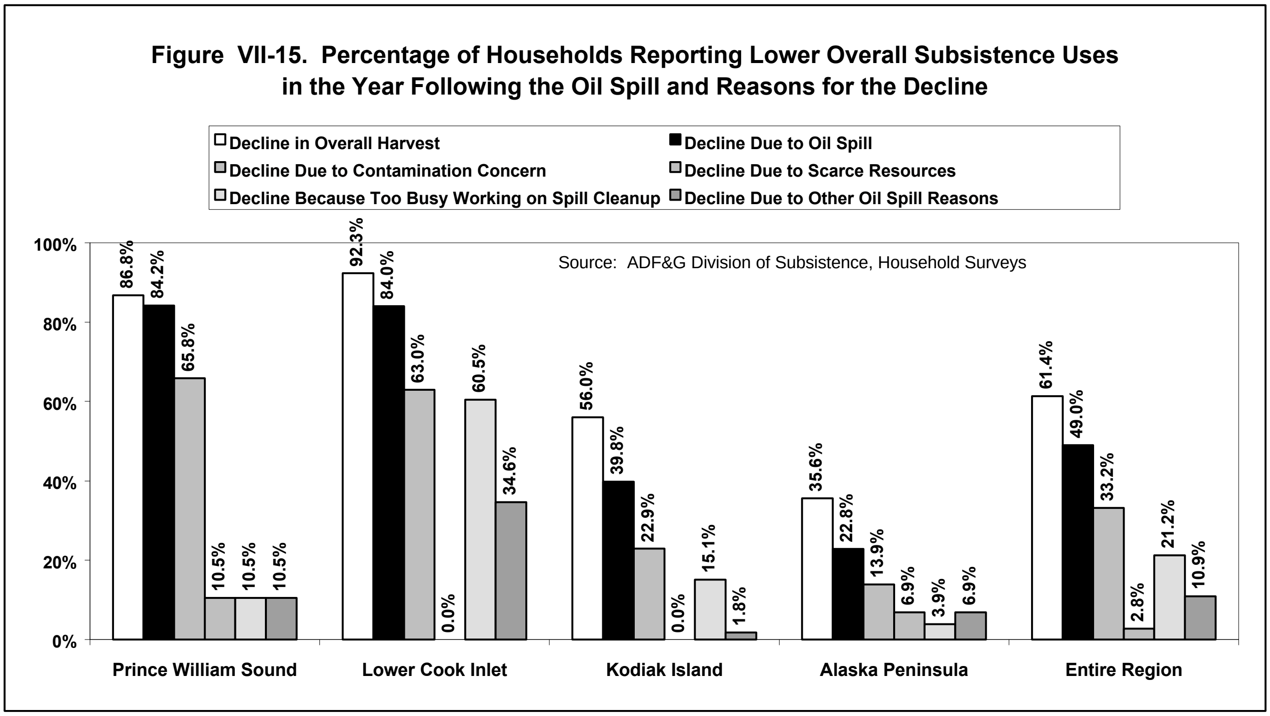


Figure VII-15. Percentage of Households Reporting Lower Overall Subsistence Uses in the Year Following the Oil Spill and Reasons for the Decline
Decline in Overall Harvest
Decline Due to Oil Spill
Decline Due to Contamination Concern
Decline Due to Scarce Resources
Decline Because Too Busy Working on Spill Cleanup
Decline Due to Other Oil Spill Reasons
Source: ADF&G Division of Subsistence, Household Surveys
100%
80%
60%
40%
20%
0%
86.8%
84.2%
65.8%
10.5%
10.5%
10.5%
92.3%
84.0%
63.0%
0.0%
60.5%
34.6%
56.0%
39.8%
22.9%
0.0%
15.1%
1.8%
35.6%
22.8%
13.9%
6.9%
3.9%
6.9%
61.4%
49.0%
33.2%
2.8%
21.2%
10.9%
Prince William Sound
Lower Cook Inlet
Kodiak Island
Alaska Peninsula
Entire Region

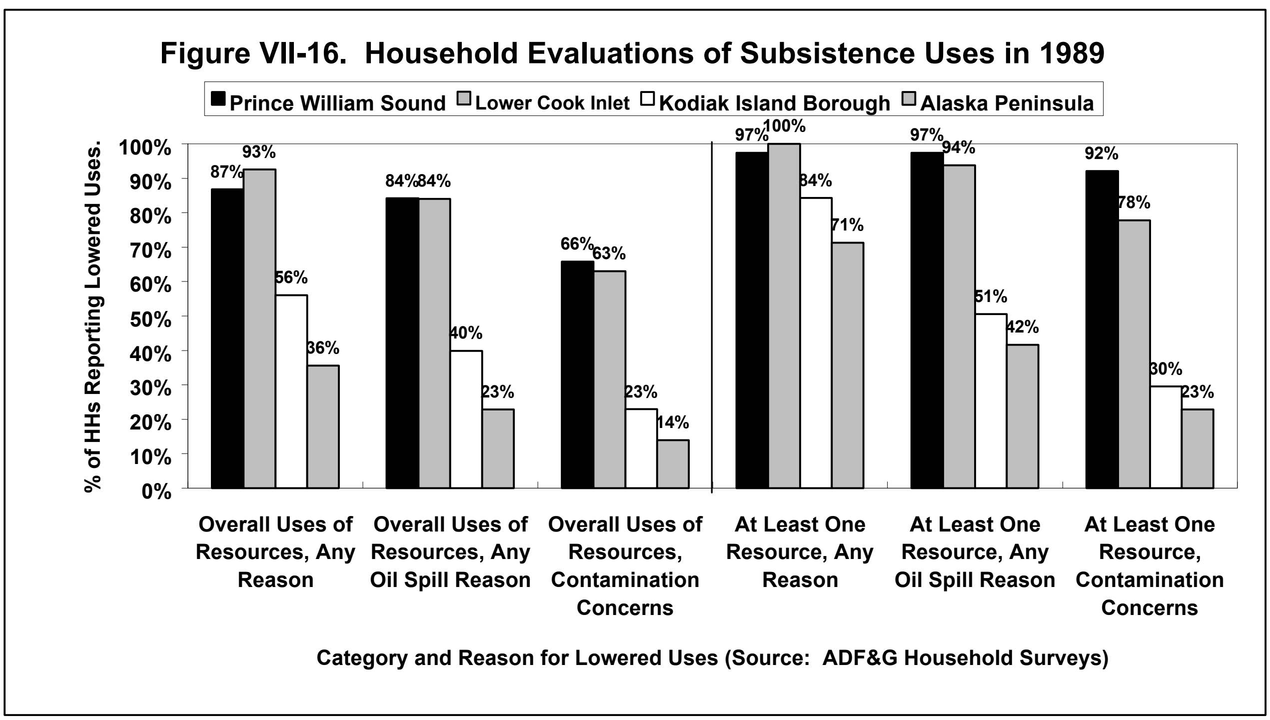


Figure VII-16. Household Evaluations of Subsistence Uses in 1989
Prince William Sound
Lower Cook Inlet
Kodiak Island Borough
Alaska Peninsula
% of HHs Reporting Lowered Uses.
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
87%
93%
56%
36%
84%
84%
40%
23%
66%
63%
23%
14%
97%
100%
84%
71%
97%
94%
51%
42%
92%
78%
30%
23%
Overall Uses of Resources, Any Reason
Overall Uses of Resources, Any Oil Spill Reason
Overall Uses of Resources, Contamination Concerns
At Least One Resource, Any Reason
At Least One Resource, Any Oil Spill Reason
At Least One Resource, Contamination Concerns
Category and Reason for Lowered Uses (Source: ADF&G Household Surveys)

Case VII-1. Some Explanations for Lower Subsistence Uses in 1989

Oil Contamination

This winter there was a lot of fish we caught that we were leery of, mainly because of oil contamination. The fish were looking different. Sometimes we threw them away or didn't eat them. Some red rockfish looked like they had oil on them. Some smelled like oil. Others looked odd inside. [Chenega Bay]

We usually put up more fish than this year [but] we were afraid that if the fish hadn't been tested, we could be harmed by the fish. . . We were totally against people eating stuff that hadn't been tested. [Tatitlek]

Normally at Ivanof Bay I would put up silvers for smoked fish and pinks for dried fish. [It was] a depressing year! People seemed scared of the ocean and people had a way below normal interest in seafood. My kids were deprived of their local seafood diet because [we had a] lack of trust in the ocean. [Ivanof Bay]

I usually get butter clams but I stopped after the spill. They say shellfish are the most dangerous because of the spill. [Chenega Bay]

I can't go out and get what I want off my beach just to eat without worrying if it is contaminated or I'll get poisoned. . . That's why I don't eat nothing off the beach. I don't eat clams no more. [Ouzinkie]

We won't touch clams after that oil was floating around. Not our family anyway. [Chignik Lake]

I didn't go to the same places [as usual] to hunt because of oil on the beach. I've seen deer eating kelp. I don't want to shoot [a] deer and find out it has been eating oil. [Tatitlek]

I didn't eat no ducks this year. I didn't want to take a chance on the oil, until they find if it is safe to eat. Then I'll go duck hunting. [Chenega Bay]

It was bad. From my personal experience on the oil spill clean up, I saw so many marine mammals swimming in the oil, with their noses and eyes sticking out of the oil. Their eyes didn't look right. . . I saw a sea lion trapped in oil. It made me so sad to see that. And out here, the sea lions crowded on the Bligh Reef buoy. I saw too much of oiled marine mammals to hunt them. [Tatitlek]

I was offered sea lion, but I didn't accept it because I was leery of the place it was taken from. I just didn't feel comfortable eating it because of the high impact of oil in the harvest area. [Chenega Bay]

Scarcities, Immediate and Potential

People thought there were fewer birds, so we shouldn't harvest to protect the population. We saw lots of birds wiped out by the spill. . . There are areas around here like that. People know they are around, but not in great numbers, so they are left alone. [Chenega Bay]

I didn't hunt this year as much as last year. I was worried about contamination. Many deer died last summer. Deer not as plentiful as before. Fishermen saw deer swimming from island to island. My heart wasn't in hunting them. I didn't want to hunt them out. [Chenega Bay]

Baby salmon fry that will soon leave the rivers will be the ones most affected. The true test will be when they return to the rivers in a few years to spawn. I fear for the future of my people. [Perryville] group reported moderate levels of decline. Respondents in the “control” communities (Petersburg and Angoon) reported relatively little change. The Oiled Mayors study also found differences between communities that generally corresponded with the geographic relationships found in this report. For example, a higher percentage of respondents in Chenega Bay, Nanwalek, Tatitlek, Larsen Bay, and Karluk reported less time involved with subsistence than in Chignik Bay or Akhiok (Impact Assessment Inc. 1990d:54).

In summary, the experiences of the first year following the spill left the people of the Pacific Gulf villages with serious questions about the future of subsistence resources and their way of life. The following three quotations from a community near the spill, mid-distant from it, and at the periphery of the extent of oiling reveal the extent and the depth of the injury that people suffered.

> We're hungry for Native food. I never thought I would be craving for octopus. But I got a liking for it and now when I want it there isn't any. [Chenega Bay]

> The other years at least we had no worries about contamination from oil spills and such. We were able to rely on our seafoods and other resources. How are our seafoods [now]? I've only heard rumors that they may be OK, and yet our monitors are still finding oil tarballs on our beaches. [Nanwalek]

> If everything went dead as a result of this oil spill or others, it would greatly affect the way we live here since we primarily live off the land. The worst part about the spill is it makes me uncertain as to how it will affect the resources in the next few years, like whether the salmon that were fry [in 1989] will return as adults either diseased, in fewer numbers, or if they'll come back at all. [Ivanof Bay]

SUBSISTENCE HARVESTS AND USES, RECOVERY AFTER THE FIRST POST-SPILL YEAR

During the second through tenth post-spill years, subsistence harvests and uses recovered gradually in terms of volume, diversity of foods, household participation, and sharing. This is illustrated in Fig. VII-18, showing harvests in ten Alutiiq villages in Prince William Sound, Lower Cook Inlet, and Kodiak Island. In these communities, wild food harvests had dropped by about half in 1989, the spill year. From 1989 to 1992, wild food harvests gradually increased from 181 pounds to 320 pounds per person. This has remained the approximate harvest level to date; the wild food harvest was 312 pounds per person in 1998, almost ten years after the spill.

Compared with pre-spill harvest levels, wild food harvests are lower on average for the ten Alutiiq villages as a whole. As shown in Figure VII-19, this is due largely to lower harvest levels in the Kodiak villages – 308 pounds per person in 1998 compared with 392 pounds per person in the pre-spill year. By 1998, estimated wild food harvest volumes in Prince William Sound and Lower Cook Inlet were very close to pre-spill estimates.

Fig. VII-19 illustrates that wild food harvests diminished for two years in Prince William Sound villages (Chenega Bay and Tatitlek). Harvest volumes in the second post-spill year (1990) were even lower than the spill year (1989). Recovery has been slower in the two Prince William Sound villages as

Figure VII-17. Changes in Subsistence Activities by Exposure Status, 1988 and 1989 Compared

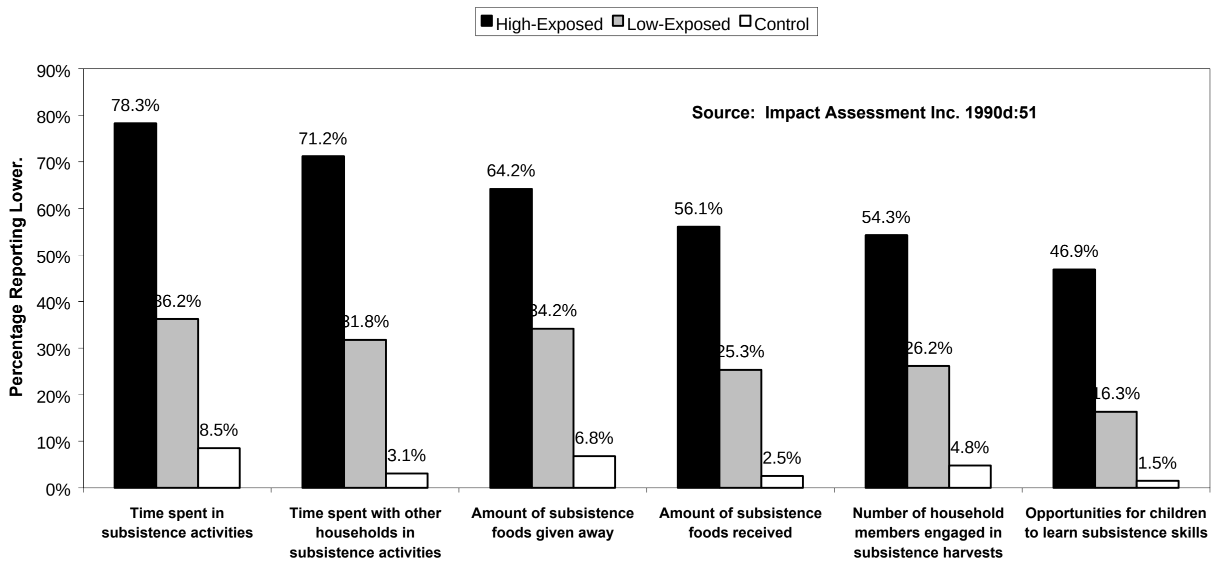
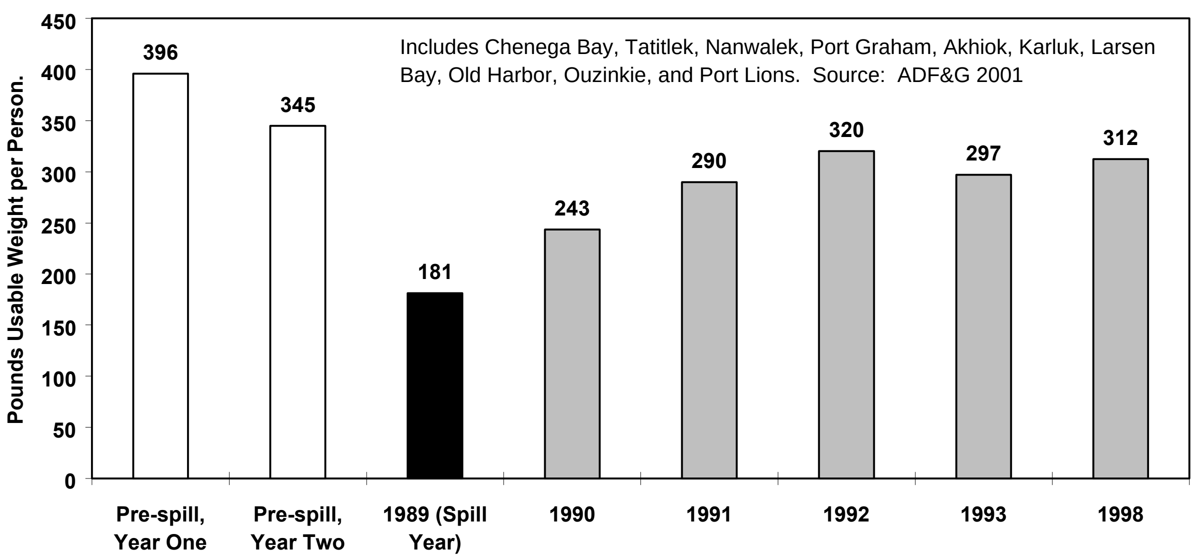


Figure VII-18. Subsistence Harvests in 10 Oil Spill Area Communities, Pre-Spill and Post-Spill Averages



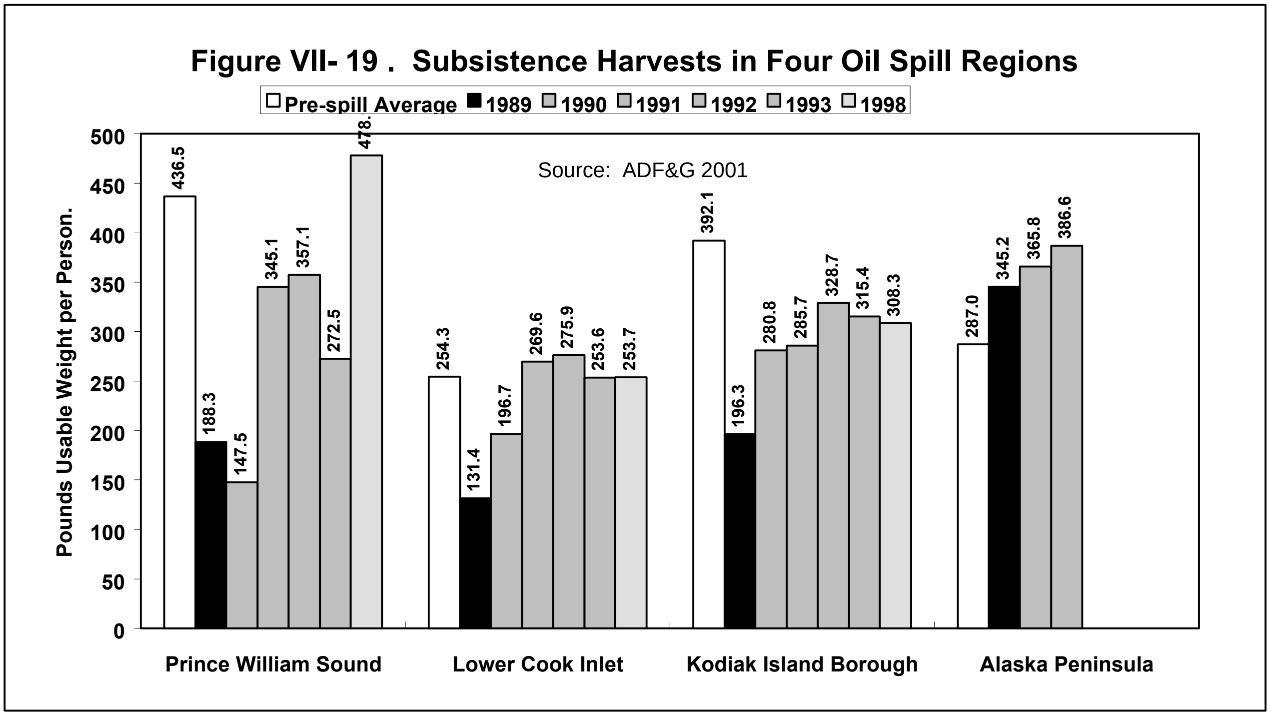


Figure VII- 19 . Subsistence Harvests in Four Oil Spill Regions
Pre-spill Average
1989
1990
1991
1992
1993
1998
Source: ADF&G 2001
Pounds Usable Weight per Person.
500
450
400
350
300
250
200
150
100
50
0
436.5
188.3
147.5
345.1
357.1
272.5
478.
254.3
131.4
196.7
269.6
275.9
253.6
253.7
392.1
196.3
280.8
285.7
328.7
315.4
308.3
287.0
345.2
365.8
386.6
Prince William Sound
Lower Cook Inlet
Kodiak Island Borough
Alaska Peninsula

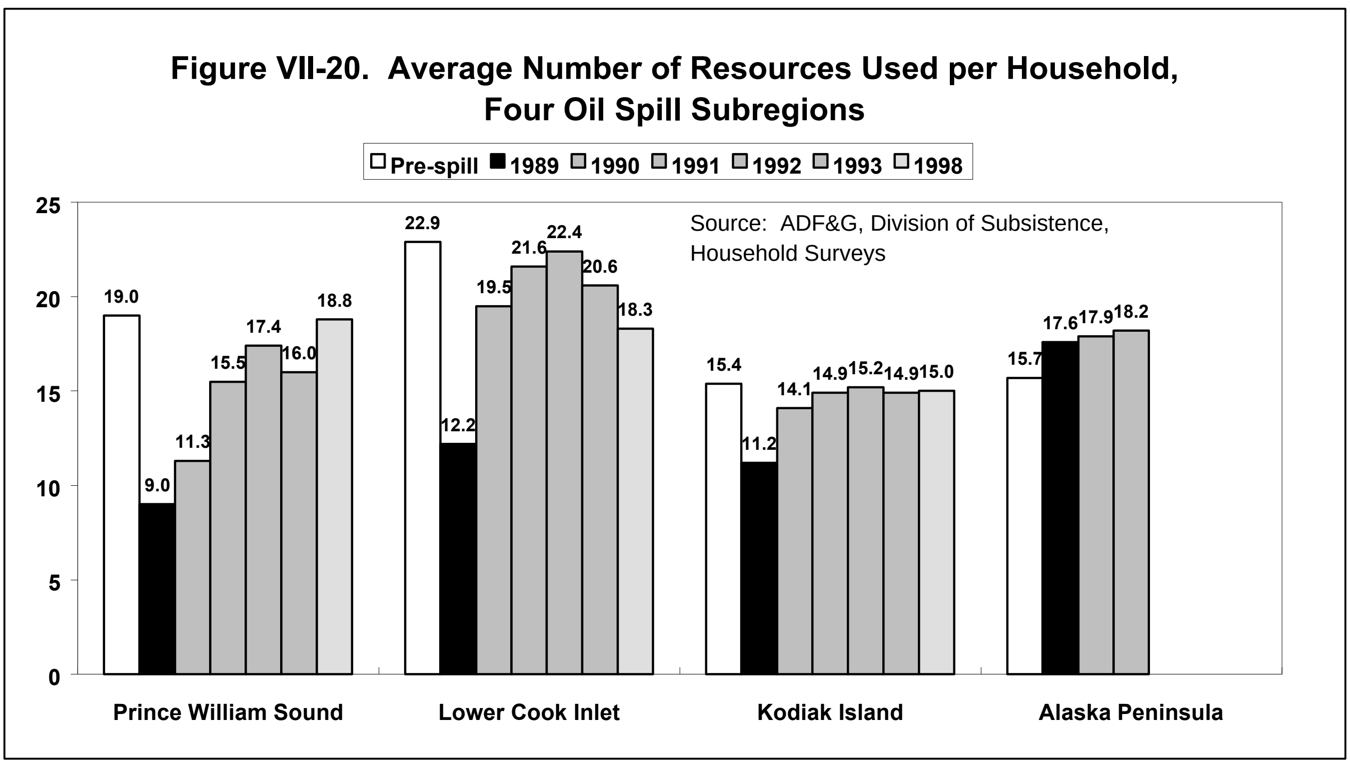


Figure VII-20. Average Number of Resources Used per Household,
Four Oil Spill Subregions
Pre-spill
1989
1990
1991
1992
1993
1998
Source: ADF&G, Division of Subsistence,
Household Surveys
25
20
15
10
5
0
19.0
9.0
11.3
15.5
17.4
16.0
18.8
22.9
12.2
19.5
21.6
22.4
20.6
18.3
15.4
11.2
14.1
14.9
15.2
14.9
15.0
15.7
17.6
17.9
18.2
Prince William Sound
Lower Cook Inlet
Kodiak Island
Alaska Peninsula

well. This was also true of other indices of subsistence activities, as illustrated in Figures VII-20 through VII-22. (See also Tables VII-2 through VI-5). Also of note was the change in harvest composition, with higher harvests of fish and lower harvests of seals and shellfish (Seitz and Miraglia 1995:21; Fall and Utermohle 1999:32,34), reflecting scarcities and lingering food safety concerns.

EXPLANATIONS FOR SUBSISTENCE HARVEST PATTERNS AFTER THE FIRST POST-SPILL YEAR

Concerns about contaminated wild foods lessened after the first post-spill year. After this, scarcities in particular wild resource stocks and populations increased as explanations for lowered subsistence uses. This explanatory shift is illustrated in Figure VII-23, which compares five communities for 1989 and 1993. As an example, 75 percent of Chenega Bay households with spill-related wild food reductions reported food safety as the reason for lowered subsistence uses in 1989 (with only 9 percent reporting resource scarcity); whereas, by 1993, 78 percent reported resource scarcity as a cause, with only 11 percent reporting food contamination.

Figure VII-24 illustrates similar changes in evaluations through 1998 for seven Alutiiq villages. Explanations of declines in subsistence uses connected to oil contamination declined from 43.4 percent of households in 1989 to 7.9 percent by 1993 and 4.1 percent by 1998. Explanations related to scarcity grew in frequency from 1.5 percent to 33.3 percent between 1989 and 1993, but dropped to 12.4 percent of households by 1998.

As illustrated by the comments in Case VII-2, some households increased their wild food harvests in years subsequent to the spill despite lingering doubts about food safety. Subsistence activities were renewed for economic, nutritional, and cultural reasons in these cases. Case VII-3 provides statements made by village residents after the first spill year about below normal levels of subsistence uses, as well as reasons for returning to harvesting and eating wild foods.

Case VII-2. In the years after the spill, some people used subsistence foods despite their misgivings:

In 1989, we had nothing [i.e,. no subsistence foods]. In 1990, we were scared and confused. We didn't know if we should eat them or not. This year [1991], we're going to go for it. We don't care if we die or not. We live mainly on subsistence anyway. [Nanwalek]

We were given some seal taken by another person from the village returning from Cordova. It was delightful to get that piece. But you wondered whether you wanted to eat it or not. But you did anyway. Because at that point you are hungry for it and you know it. You just think it is going to be OK and you eat it. [Chenega Bay]

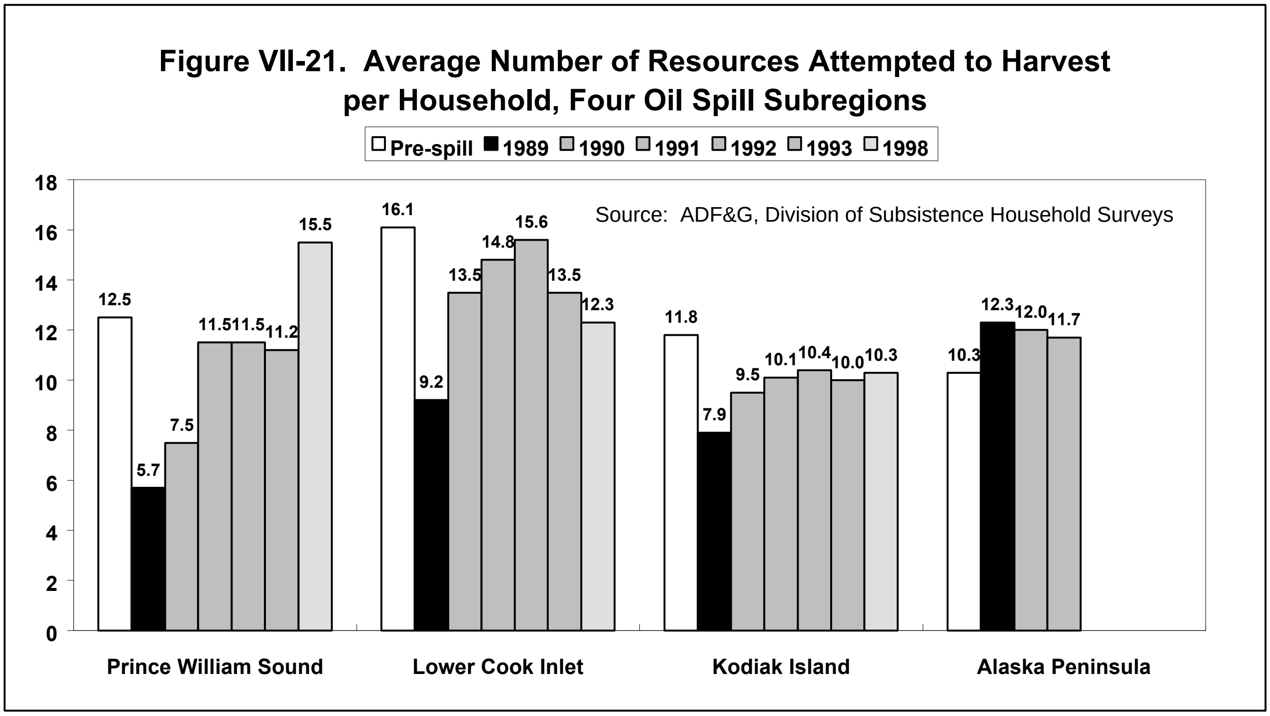


Figure VII-21. Average Number of Resources Attempted to Harvest per Household, Four Oil Spill Subregions
Pre-spill 1989 1990 1991 1992 1993 1998
Source: ADF&G, Division of Subsistence Household Surveys
0 2 4 6 8 10 12 14 16 18
12.5 5.7 7.5 11.5 11.5 11.2 15.5
16.1 9.2 13.5 14.8 15.6 13.5 12.3
11.8 7.9 9.5 10.1 10.4 10.0 10.3
10.3 12.3 12.0 11.7
Prince William Sound
Lower Cook Inlet
Kodiak Island
Alaska Peninsula

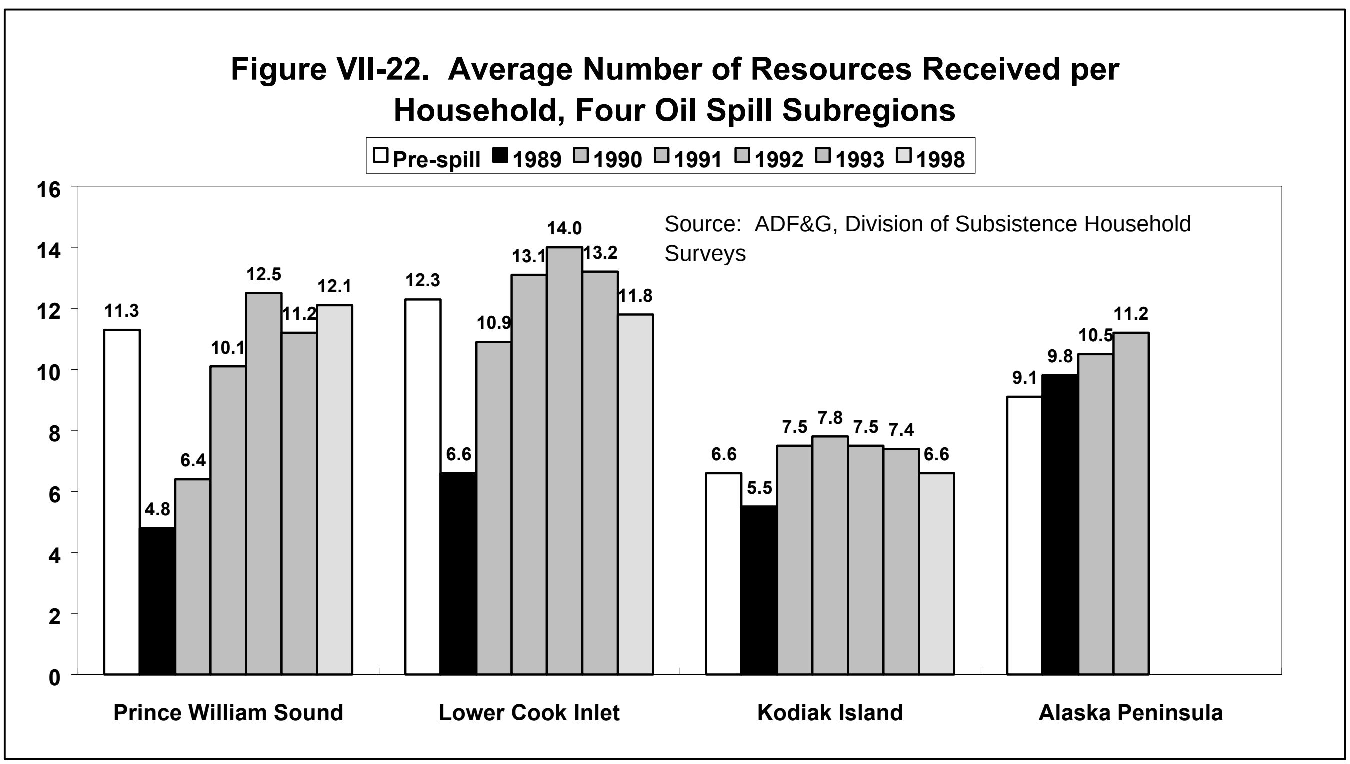


Figure VII-22. Average Number of Resources Received per Household, Four Oil Spill Subregions
Pre-spill 1989 1990 1991 1992 1993 1998
Source: ADF&G, Division of Subsistence Household Surveys
0 2 4 6 8 10 12 14 16
11.3 4.8 6.4 10.1 12.5 11.2 12.1
12.3 6.6 10.9 13.1 14.0 13.2 11.8
6.6 5.5 7.5 7.8 7.5 7.4 6.6
9.1 9.8 10.5 11.2
Prince William Sound
Lower Cook Inlet
Kodiak Island
Alaska Peninsula

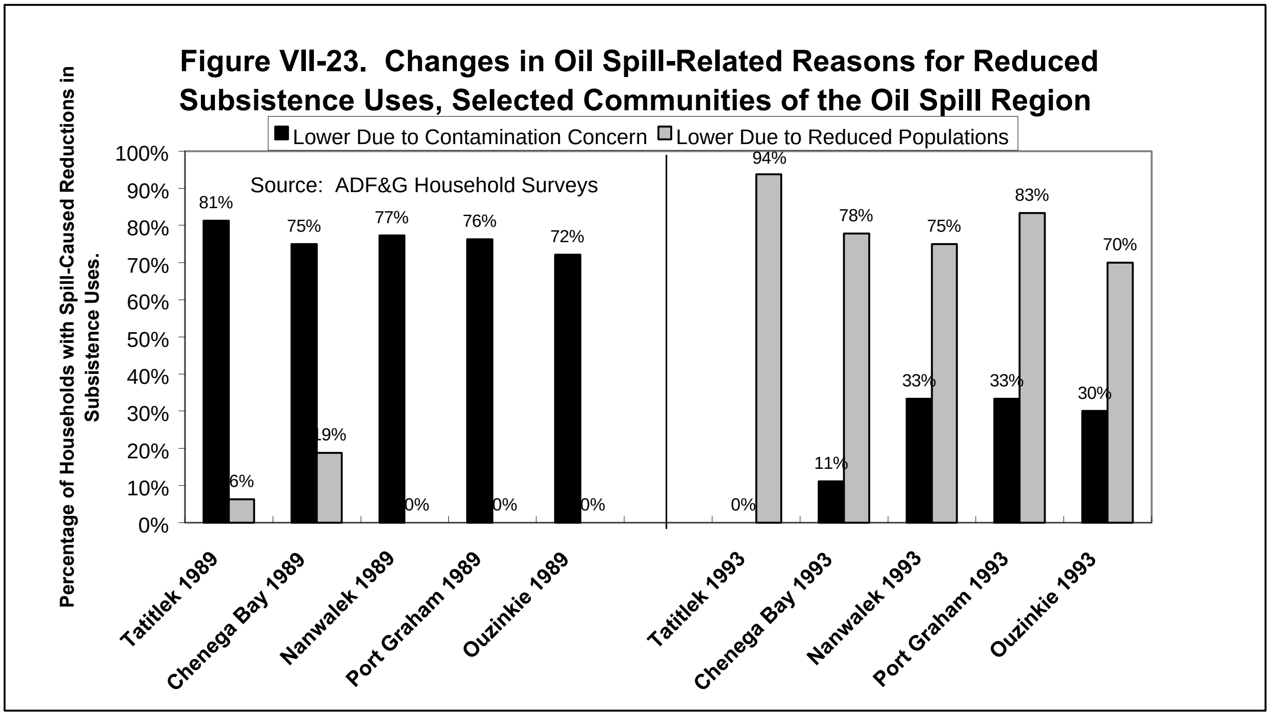


Figure VII-23. Changes in Oil Spill-Related Reasons for Reduced Subsistence Uses, Selected Communities of the Oil Spill Region
Lower Due to Contamination Concern
Lower Due to Reduced Populations
Source: ADF&G Household Surveys
Percentage of Households with Spill-Caused Reductions in Subsistence Uses.
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
81%
6%
75%
19%
77%
0%
76%
0%
72%
0%
0%
94%
11%
78%
33%
75%
33%
83%
30%
70%
Tatitlek 1989
Chenega Bay 1989
Nanwalek 1989
Port Graham 1989
Ouzinkie 1989
Tatitlek 1993
Chenega Bay 1993
Nanwalek 1993
Port Graham 1993
Ouzinkie 1993

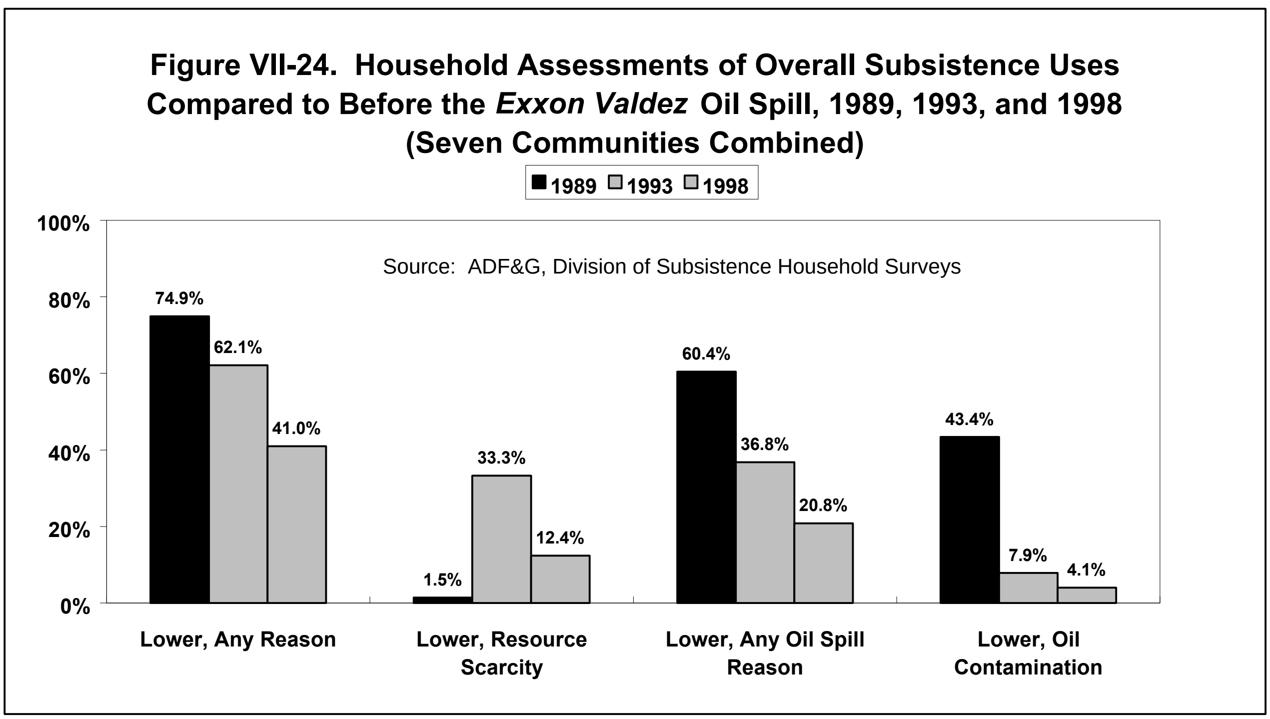


Figure VII-24. Household Assessments of Overall Subsistence Uses Compared to Before the Exxon Valdez Oil Spill, 1989, 1993, and 1998 (Seven Communities Combined)
1989
1993
1998
Source: ADF&G, Division of Subsistence Household Surveys
100%
80%
60%
40%
20%
0%
74.9%
62.1%
41.0%
1.5%
33.3%
12.4%
60.4%
36.8%
20.8%
43.4%
7.9%
4.1%
Lower, Any Reason
Lower, Resource Scarcity
Lower, Any Oil Spill Reason
Lower, Oil Contamination

CASE VII-3. REASONS FOR CHANGES IN SUBSISTENCE USES AFTER THE FIRST POST-SPILL YEAR

Reasons for Continuing Low Harvests and Uses

I usually fish a lot, but I don't want to eat the fish from around here and then find out later that there was something wrong with them and I shouldn't have. [Chenega Bay, April 1991]

I think it was worse in 1989, but last summer [1990], I was still scared to eat [salmon]. You wonder if you could get poisoned or sick. [Port Graham, April 1991]

I'm still not sure about them [shellfish]. I used to eat a lot more. That was my upbringing. [Ouzinkie, April 1991]

[Harvests of shellfish] were even worse than the year before. It was very poor compared to normal. I tried to get octopus but couldn't find any. I could get three a night before the spill. I had to walk ten miles and still didn't find any. I'd still find a few last year, but this year absolutely nothing. I know it is because of the oil spill. They either died or the smell of the oil ruined their homes. That's one of our best foods in the winter. [Tatitlek, April 1991]

You don't just pick clams anyplace anymore. The clams in the area, I'm afraid to use. We went to Port Ashton, to get as far away from oil as possible, and not go too far away. We're not gonna eat clams from the oiled areas. They have the highest level of hydrocarbons of all of them. I still hunger for clams, shrimp, crab, octopus, gumboots. Nothing in this world will replace them. To finally be living in my ancestors' area and be able to teach my kids, but now it's all gone. We still try, but you can't replace them. [Chenega Bay 1993]

It was even worse than last year. We are leery of collecting [gull] eggs. There are fewer eggs, and fewer ducks than before the oil spill. The sky is usually black with ducks during herring season, but not this year. [Tatitlek 1991]

I think they [shellfish] are very scarce. You really have to look to get any shellfish or bidarkies. You can't go down the beach like we used to. [Port Graham, April 1991]

There aren't as many [birds] since the oil spill. It seemed like it took months before we even seen any around. [Ouzinkie, April 1991]

The seals are quite a ways down [in population]. There's hardly any seal you find around here after the oil spill. We used to get them in Dogfish Bay. Now there's nothing. There's only a few sea otters. Sea lions are disappearing too. [Nanwalek, April 1991]

I'm real leery of eating seals. I like the liver, kidney, and intestines. That's where the toxins are. [Chenega Bay, April 1992]

Seals are very scarce. When you go out on a boat, you seldom see seals or sea lions like before. Man, the water is just dead. . . Now we have to go thirty miles by boat to find seals. We used to get them less than two miles away from the village. [Chenega Bay, April 1992]

We don't see the animals. We used to have eagles perched out here [on Evans Island], and grouse and porcupine. [Elrington Passage] is dead. You don't see the little brown ducks. . . They're gone. [There are] few seagulls and seals. [Chenega Bay 1993]

[continued on next page]

CASE VII-3, CONTINUED

Reasons for Resuming Uses of Subsistence Foods

We caught a lot more salmon this last year [than 1989]. We got away from the fear of oil. We were getting some information about contamination of fish, that they were not really affected, and we had a little more time for [fishing]. [Port Graham, 1991]

We just started going out [for shellfish] during the past few months. We did not harvest any during 1989. We are starting to trust the shellfish again. We changed our minds because there were samples tested and the results came back good, saying things were OK. [Nanwalek 1991]

I harvested no birds at all in the year after the spill, but my harvests are back to normal now because I can see what's going on with them and I got hungry for them. [Ouzinkie 1991]

We harvested more salmon [in 1990-91 than in 1989] because we believe that fish are safe to eat again. We have more confidence [in the safety of shellfish] since the spill is over. [Karluk 1991]

Our [deer harvest] was less than usual, even less than 1989. There were less deer to hunt. We were afraid to eat them, worried about oil. We ate them anyway, because otherwise we wouldn't have anything to eat. We say, "At least if we die from it, we all die together." [Tatitlek, April 1991]

We started craving for it [seal meat]. We could only go so long without it. We get tired of eating beef and chicken. We wouldn't touch [seal] that first year after the spill. [Now] subsistence food is on our table at least twice a week. [Tatitlek, April 1991]

There was a big increase [in harvests] in 1990 over 1989. We had a great need and were willing to take the risk of contamination because we needed the food and nutrition. [Port Graham, April 1991]

Villagers' concerns about food contamination can be evaluated in more detail by examining responses to questions about the safety of eating particular items. As illustrated in Figure VII-25, 80.2 percent of the oil spill area respondents to the social effects question "Are Seals Safe for Children to Eat?" answered in the affirmative during the last round of interviews in their community. Confidence in the safety of eating seal was lowest in Prince William Sound and Lower Cook Inlet communities nearest the spill (72.8 percent), higher in Kodiak Island communities (87.1 percent), and highest in Alaska Peninsula communities (100 percent). As shown in Figure VII-26, in the third through the fifth post-spill years, the oil spill was the major reason for distrust of the safety of eating seals.

This question was repeated in eight study communities in 1998 (Fig. VII-27). A large majority of respondents in all communities expressed confidence that seals were safe to eat, while about 14 percent overall said "no" or were not sure. In contrast to earlier findings, by 1998 the oil spill was no longer the prevailing explanation for uncertainty about the safety of eating seal (Figure VII-28). Only 3.5 percent of respondents cited the spill as a reason for children not to eat seals; 10.4 percent gave other reasons, largely having to do with general ocean pollution.

Assessments of the safety of eating clams show some interesting similarities and contrasts to the assessments of seals. In the last round of social effects surveys, about 75 percent of households said clams were safe for children to eat (Fig. VII-29). As with seals, confidence in the safety of clams was lowest in the Prince William Sound and Lower Cook Inlet villages (59 percent). For those who distrusted clams, oil contamination was the dominant explanation (Fig. VII-30).

By 1998, reported confidence in the safety of clams had improved in Chenega Bay and Tatitlek, the Alutiiq villages nearest the spill (Fig. VII-31). Oil contamination had declined markedly as a cause of suspicion in all the villages (Fig. VII-32). However, distrust of clams had increased in Kodiak Island communities as a result of concerns about paralytic shellfish poisoning (PSP) (Fig. VII-33). Two highly publicized cases of PSP had occurred on Kodiak Island during this period – a woman at Old Harbor and a man at Karluk had consumed tainted clams – and annual warnings about PSP were issued by the Alaska Department of Environmental Conservation.

These findings clearly show why households nearest the spill reduced their subsistence harvests during the first and second post-spill years. Families nearest the spill made hard choices to reduce wild food harvests because of an over-riding desire to protect the health of family and community members. At the time of the spill, there was considerable uncertainty in the public about the toxicity of crude oil and the health risks to humans exposed to crude oil through the food chain. Refined petroleum products used in Alutiiq villages, such as boat fuel and stove oil, were generally known by local residents to be highly toxic. However, the level of toxicity of crude oil was not generally known (see Chapter Six). Given the high level of uncertainty, families made a conservative choice to forego wild food uses rather than risk potentially serious health problems. As discussed below, this line of action was feasible because of short-term employment options for households in oil spill cleanup and response programs.

Figure VII-25. Percentage of Households that Use Seals for Subsistence that Believe Seals are Safe for Children to Eat, by Community Type (1992 or 1994)

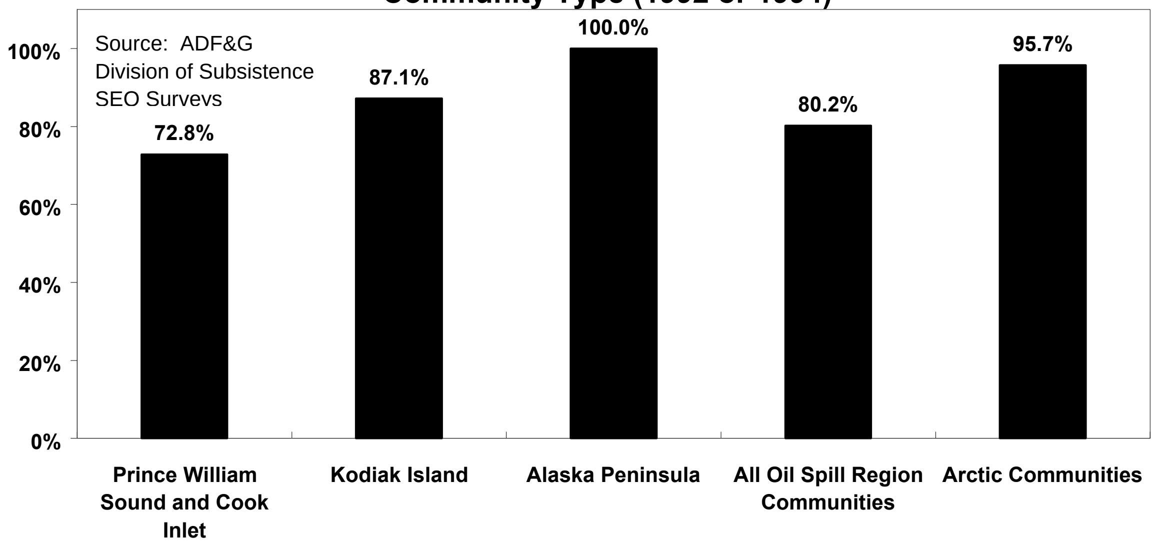


Figure VII-26 . Reasons Why Seals Not Safe to Eat, through 1994

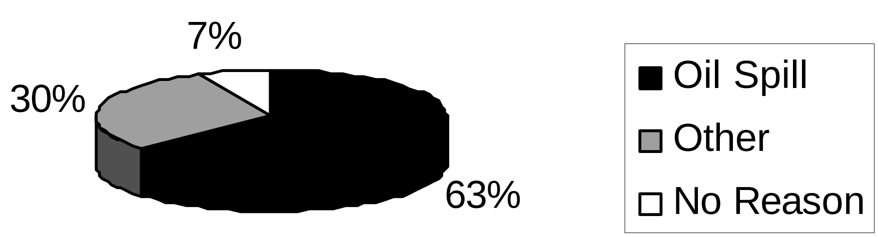


Figure VII-27. Are Seals Safe for Children to Eat? Responses in 1998

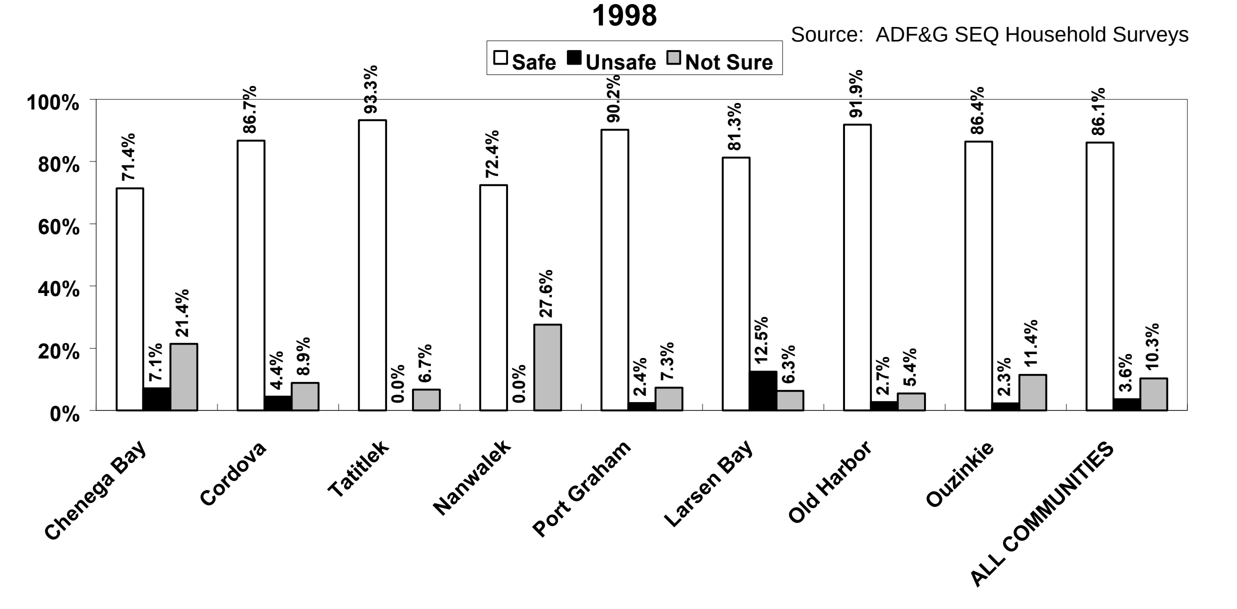
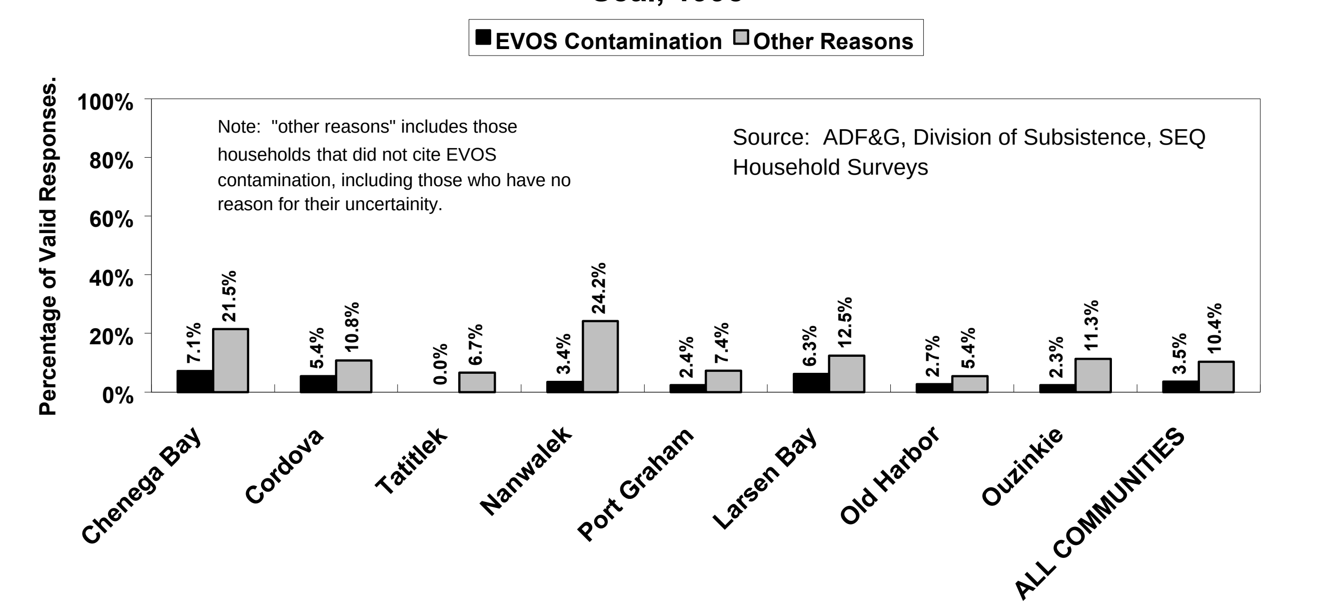


Figure VII-28. Reasons for Uncertainty about the Safety of Eating Seal, 1998



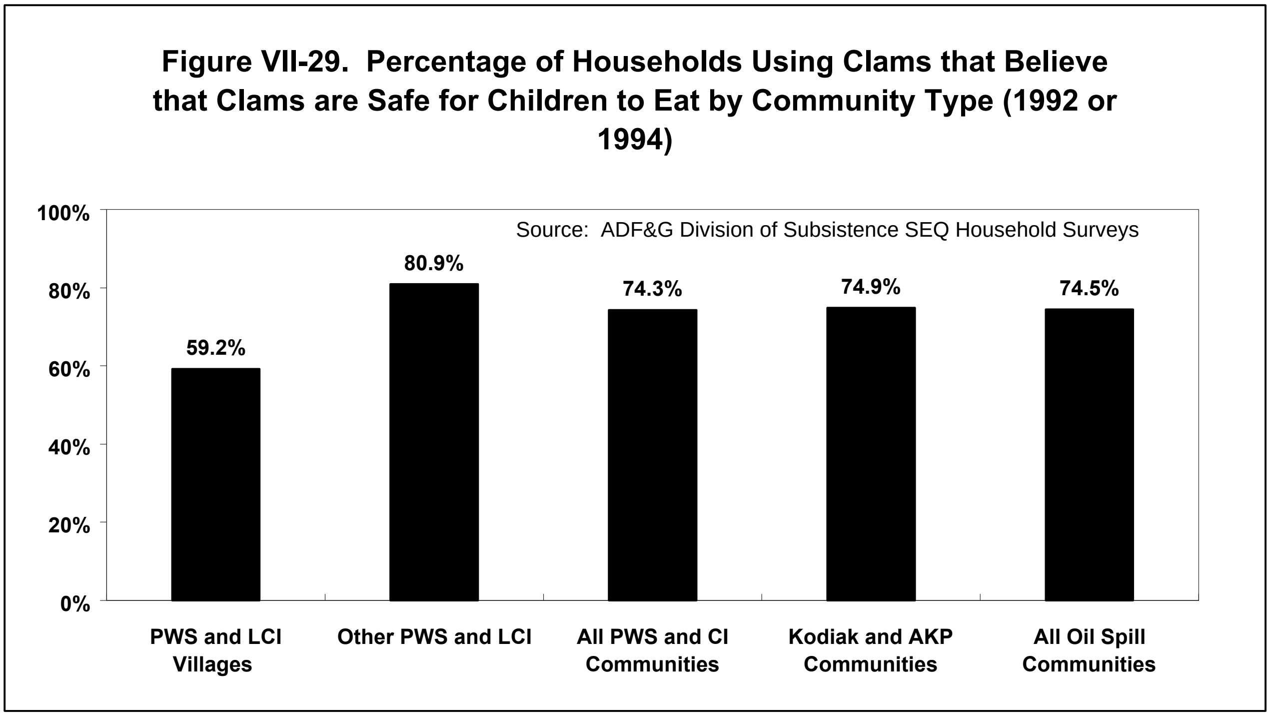


Figure VII-29. Percentage of Households Using Clams that Believe that Clams are Safe for Children to Eat by Community Type (1992 or 1994)
100%
80%
60%
40%
20%
0%
Source: ADF&G Division of Subsistence SEQ Household Surveys
59.2%
80.9%
74.3%
74.9%
74.5%
PWS and LCI Villages
Other PWS and LCI
All PWS and CI Communities
Kodiak and AKP Communities
All Oil Spill Communities

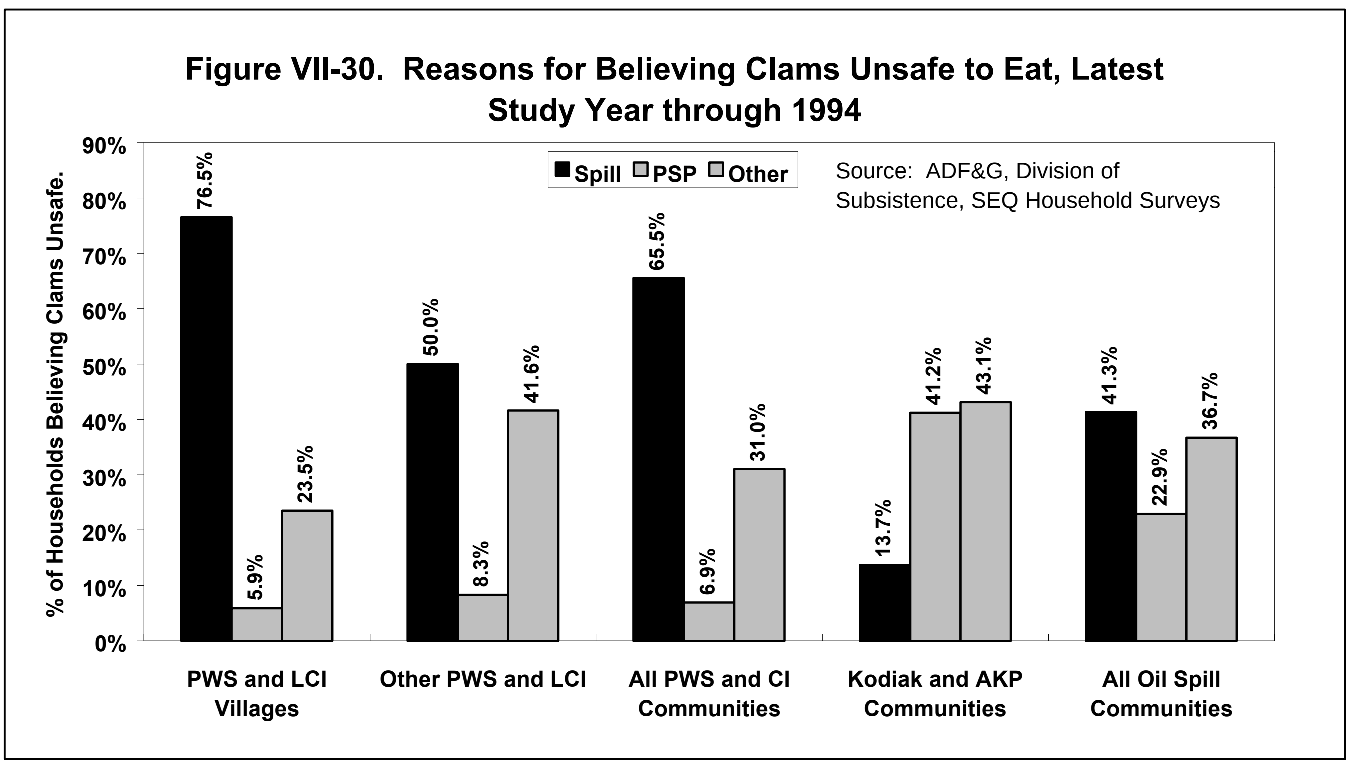


Figure VII-30. Reasons for Believing Clams Unsafe to Eat, Latest Study Year through 1994
% of Households Believing Clams Unsafe.
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Spill
PSP
Other
Source: ADF&G, Division of Subsistence, SEQ Household Surveys
76.5%
5.9%
23.5%
50.0%
8.3%
41.6%
65.5%
6.9%
31.0%
13.7%
41.2%
43.1%
41.3%
22.9%
36.7%
PWS and LCI Villages
Other PWS and LCI
All PWS and CI Communities
Kodiak and AKP Communities
All Oil Spill Communities

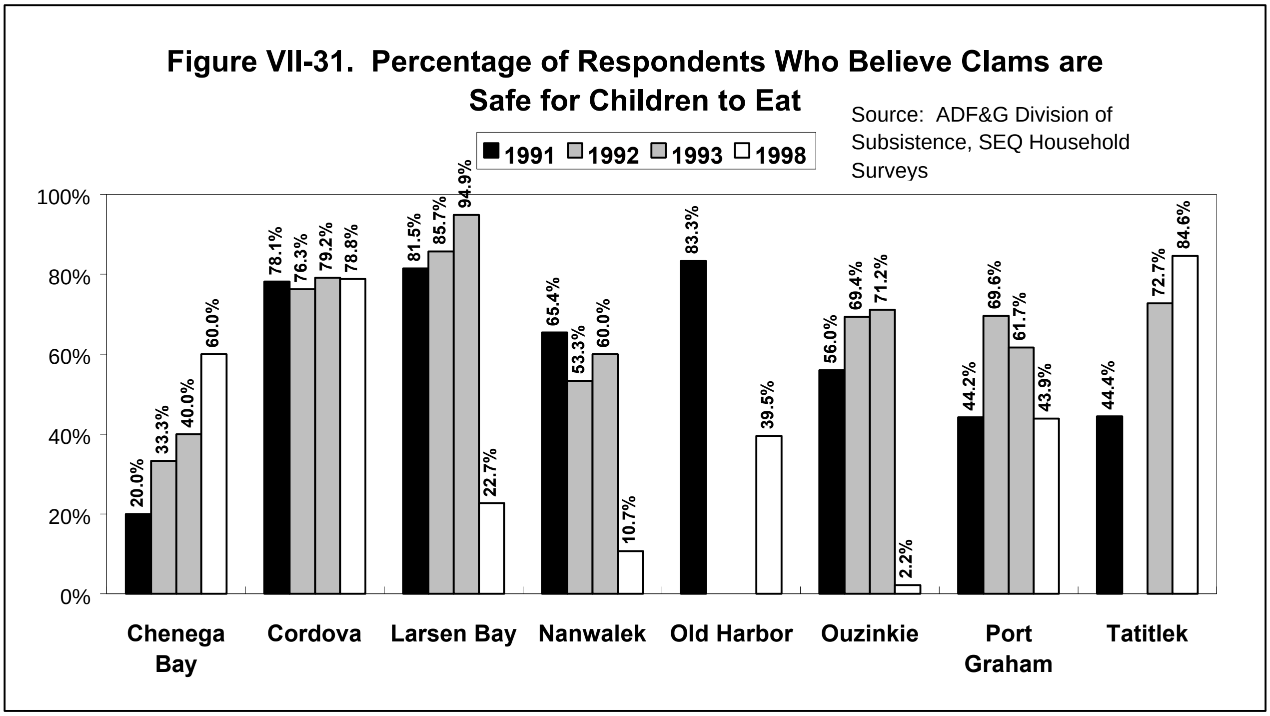


Figure VII-31. Percentage of Respondents Who Believe Clams are Safe for Children to Eat
Source: ADF&G Division of Subsistence, SEQ Household Surveys
1991
1992
1993
1998
100%
80%
60%
40%
20%
0%
20.0%
33.3%
40.0%
60.0%
78.1%
76.3%
79.2%
78.8%
81.5%
85.7%
94.9%
22.7%
65.4%
53.3%
60.0%
10.7%
83.3%
39.5%
56.0%
69.4%
71.2%
2.2%
44.2%
69.6%
61.7%
43.9%
44.4%
72.7%
84.6%
Chenega Bay
Cordova
Larsen Bay
Nanwalek
Old Harbor
Ouzinkie
Port Graham
Tatitlek

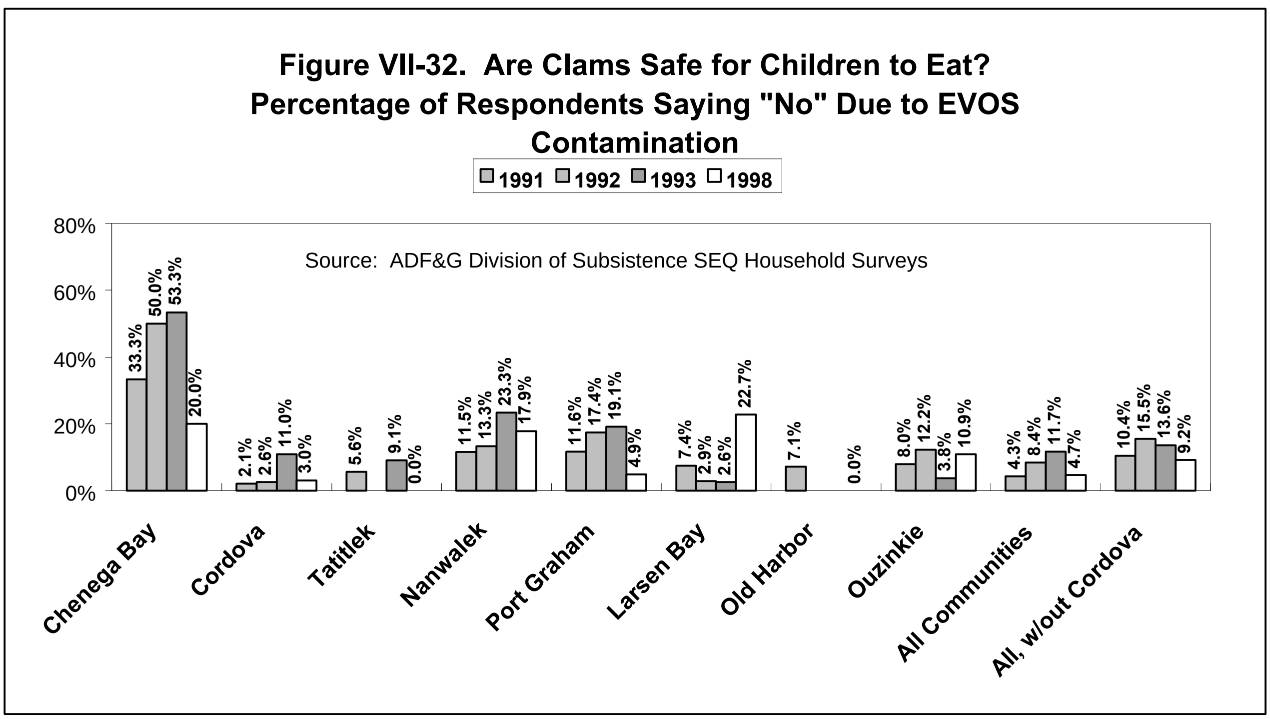


Figure VII-32. Are Clams Safe for Children to Eat? Percentage of Respondents Saying "No" Due to EVOS Contamination
1991
1992
1993
1998
80%
60%
40%
20%
0%
Source: ADF&G Division of Subsistence SEQ Household Surveys
33.3%
50.0%
53.3%
20.0%
2.1%
2.6%
11.0%
3.0%
5.6%
9.1%
0.0%
11.5%
13.3%
23.3%
17.9%
11.6%
17.4%
19.1%
4.9%
7.4%
2.9%
2.6%
22.7%
7.1%
0.0%
8.0%
12.2%
3.8%
10.9%
4.3%
8.4%
11.7%
4.7%
10.4%
15.5%
13.6%
9.2%
Chenega Bay
Cordova
Tatitlek
Nanwalek
Port Graham
Larsen Bay
Old Harbor
Ouzinkie
All Communities
All, w/out Cordova

Figure VII-33. Are Clams Safe for Children to Eat? Percentage of Respondents Saying "No" Due to PSP

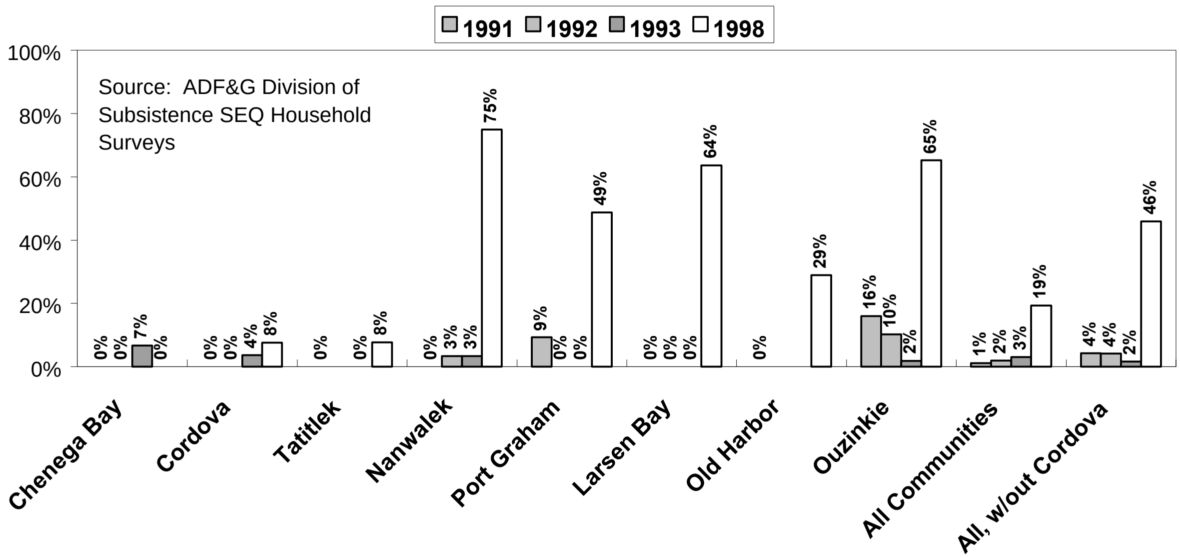
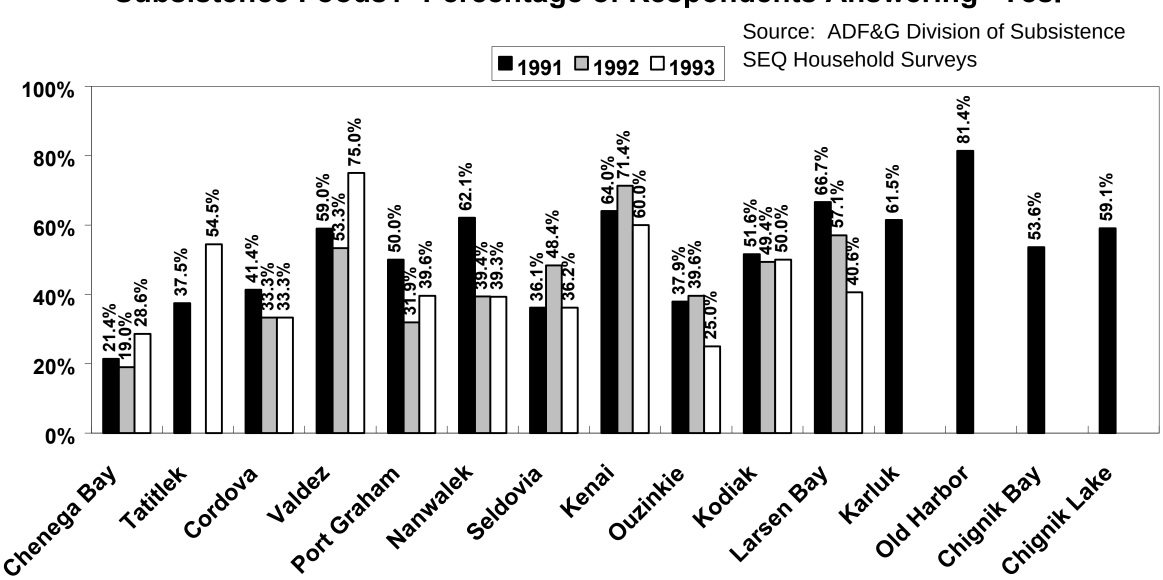


Figure VII-34. Were You Adequately Informed about the Safety of Subsistence Foods? Percentage of Respondents Answering "Yes."



During the first post-spill year, information on food safety derived in part from local observations by community members. In Chenega Bay, one hunter butchered a seal with an abnormal liver – it was soft and runny, rather than firm. Another resident observed that the arm of a starfish fell apart when the animal was pulled from the rocks. A blind sea lion was observed in September 1990. Reports circulated about dead eagles, sea gulls, and a black bear. These were considered unusual occurrences (Evanoff 1990). Such observations of abnormalities fed into the corpus of information regarding potential health risks of consuming wild foods harvested from the spill area.

Many households were concerned that food safety information issued by public agencies was incomplete or non-authoritative (Fig. VII-34, Table VII-6). Among households who reported they were not adequately informed about food safety, 46 percent said that they did not trust the information they received (Fig. VII-35). Although most did not give a specific reason for this distrust, some respondents explained that they were uncomfortable with Exxon's involvement in providing the food safety assessments. Others said that the advice that fish, birds, and marine mammals visibly free of oil were safe to eat contradicted local observations of resource abnormalities in the natural environment. Many respondents (41.9 percent) said that public information they received was inadequate because it was unclear or not sufficiently definitive. Related responses included the belief that the information was incomplete (29.1 percent) or was based on an inadequate number of tests (16.4 percent). Other reasons included suspicion that information was deliberately withheld (16.4 percent) and that the information had not been provided in a timely manner (27.3 percent). Forty percent of those who claimed to be inadequately informed said that they had received no information at all.

As stated above, as wild food harvests began a course of recovery, resource scarcities replaced oil contamination as the prevailing explanation of lower subsistence uses by households (Figures VII-23 and VII-24). By 1998, large numbers of respondents reported depressed populations of a variety of fish and wildlife (Table VII-7). Many continued to point to the oil spill as a source of these declines, as shown in Figure VII-36. (See Fall and Utermohle 1999:62-68 for more discussion of respondents' assessments of natural resource population status in 1998.)

PARTICIPATION IN SUBSISTENCE USES

Participation in subsistence activities rebounded after the immediate post-spill declines in relation to time and distance from Prince William Sound. Except for the Alaska Peninsula, the average number of kinds of resources targeted for harvest in 1993/94 remained slightly below pre-spill levels in each area. By 1998, this index of participation in subsistence activities was about the same as before the spill in Prince William Sound and Kodiak Island, but somewhat lower in the Lower Cook Inlet communities.

Tatitlek is the only community with pre-spill data on individual participation in subsistence activities. As shown in Table VII-8, there was a marginal decline in the percentage of community

Table VII-6. Evaluation of Adequacy of Subsistence Food Safety Information by Community Type and Study Year

Community Type	Were You Adequately Informed about the Safety of Subsistence Foods? Percentage of Households Answering "Yes"		
	1991	1992	1993
Prince William Sound and Lower Cook Inlet Villages	46.8%	31.7%	40.2%
Kodiak Island Borough Villages	62.8%	46.9%	31.4%
Alaska Peninsula	56.0%		
Mid-Sized Communities (Towns)	49.2%	44.6%	44.2%
Large Communities (Cities)	62.2%	64.7%	65.7%
All Communities	55.1%	55.2%	55.1%

Source: ADF&G Division of Subsistence SEQ Household Surveys

Figure VII-35. Reasons Given for Not Being Adequately Informed about the Safety of Subsistence Foods after the *Exxon Valdez* Oil Spill

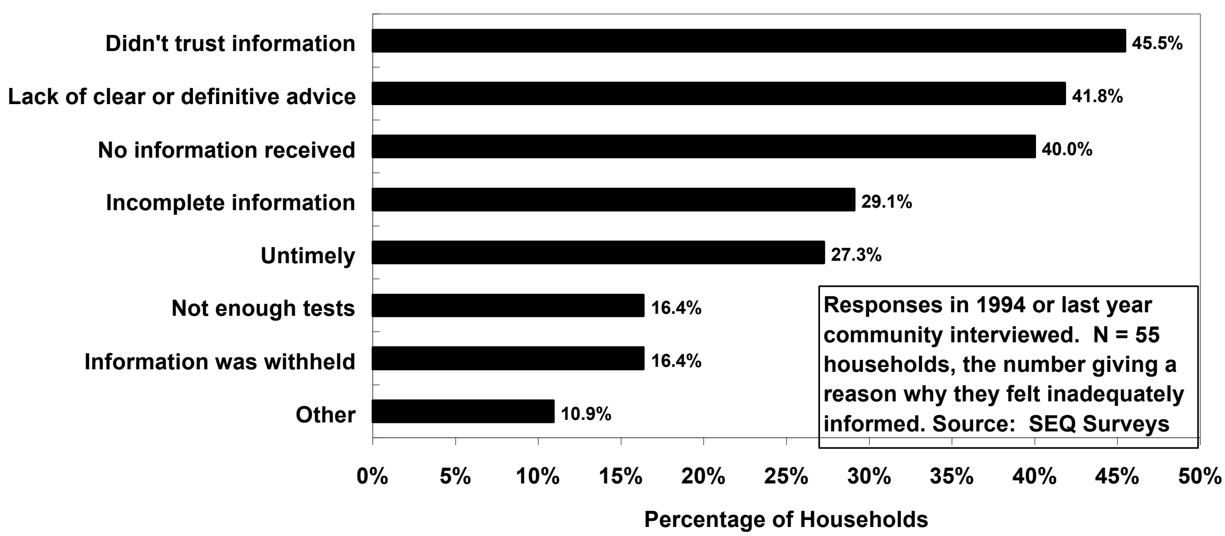
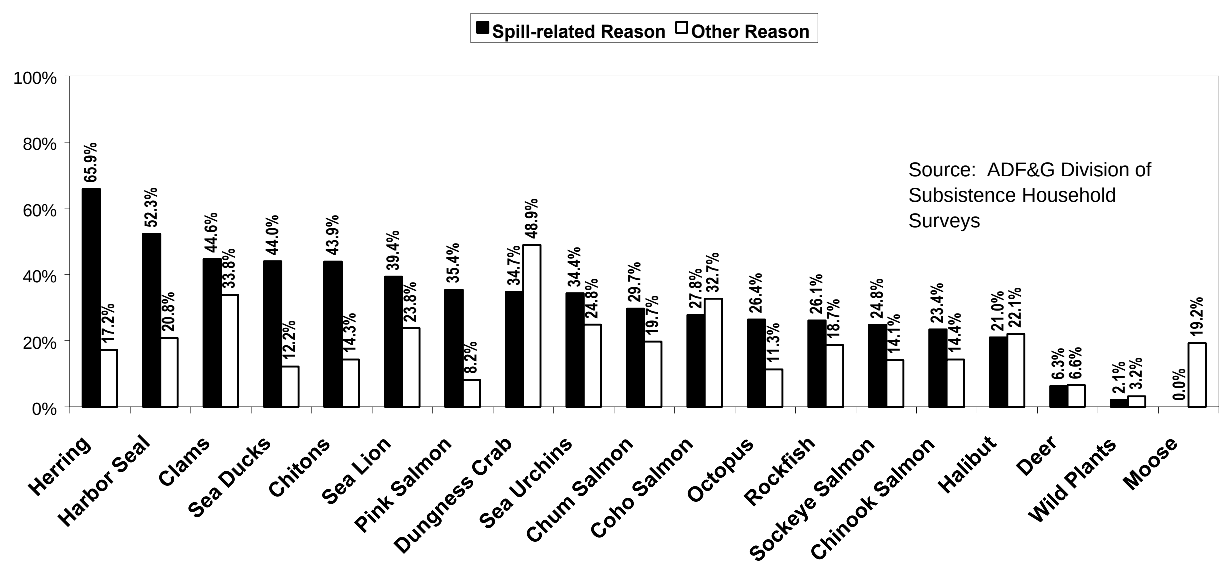


Table VII-7. Households' Assessments of Availability of Resources to Harvest, 1997/98

	Percentage Reporting Less Available to Harvest (Percent of Valid Responses)							
	Chenega Bay	Cordova	Tatitlek	Nanwalek	Port Graham	Larsen Bay	Old Harbor	Ouzinkie
Chum Salmon	25.0%	53.8%	50.0%	60.0%	33.3%	63.6%	48.3%	61.5%
Coho Salmon	85.7%	70.2%	45.5%	53.6%	45.7%	45.5%	45.2%	45.2%
Chinook Salmon	12.5%	43.5%	44.4%	77.8%	38.5%	41.7%	26.1%	24.3%
Pink Salmon	0.0%	51.9%	41.7%	37.9%	36.8%	14.3%	41.9%	9.8%
Sockeye Salmon	44.4%	39.2%	50.0%	75.9%	34.2%	40.0%	42.9%	22.0%
Herring	100.0%	91.8%	55.7%	63.2%	63.9%	33.3%	68.0%	62.5%
Rockfish	60.0%	45.6%	28.6%	58.3%	13.3%	22.2%	40.0%	78.1%
Halibut	28.6%	51.3%	41.7%	37.9%	32.4%	11.1%	35.5%	45.0%
Deer	16.7%	8.0%	22.2%	*	*	30.8%	15.4%	30.2%
Moose	*	*	*	31.8%	10.3%	*	*	*
Harbor Seal	100.0%	75.8%	72.7%	88.9%	62.2%	20.0%	84.6%	78.6%
Sea Lion	85.7%	48.4%	55.6%	66.7%	48.6%	57.1%	96.0%	77.5%
Sea Ducks	66.7%	52.8%	40.0%	80.8%	37.0%	22.2%	63.0%	74.4%
Dungeness Crab	66.7%	87.7%	62.5%	92.3%	76.9%	50.0%	72.0%	92.3%
Chitons	33.3%	83.3%	25.0%	85.7%	57.9%	33.3%	40.7%	47.5%
Clams	85.7%	86.3%	66.7%	81.5%	67.5%	58.3%	54.5%	92.1%
Octopus	85.7%	36.8%	45.5%	44.0%	25.0%	27.3%	35.0%	45.9%
Sea Urchins	50.0%	64.7%	42.9%	84.6%	41.9%	40.0%	53.8%	73.5%
Wild Plants	11.1%	3.8%	18.2%	17.9%	7.9%	0.0%	6.1%	2.2%

* Not asked in this community
Source: Fall and Utermohle 1999

Figure VII-36. Percentage of Households Providing Oil Spill and Non-Oil Spill Reasons for Declines in Availability of Resources, 1997/98



residents who hunted, fished, or engaged in any subsistence activity during the first year after the spill. Participation rates increased notably in 1991/92 and 1993/94. The decline in the percentage of Tatitlek residents involved in any subsistence activities in 1997/98 is largely the result of an unexplained decline in involvement in plant gathering (Fig. VII-37). Rates of involvement in fishing and hunting at Tatitlek were higher in 1997/98 than before the spill.

Table VII-8. Individual Participation in Subsistence Activities: Tatitlek

	1987/88	1988/89	1989/90	1990/91	1991/92	1993/94	1997/98
Hunting	26.3%	29.0%	21.8%	20.0%	40.8%	33.3%	29.2%
Fishing	42.1%	44.7%	41.4%	34.7%	52.6%	58.0%	58.3%
Trapping	7.9%	4.0%	1.2%	5.3%	1.3%	2.9%	4.2%
Gathering Plants	63.2%	55.3%	59.8%	53.3%	81.6%	87.0%	39.6%
Any Activity	79.0%	72.4%	65.5%	62.7%	84.2%	91.3%	68.8%

Source: ADF&G Division of Subsistence Household Surveys

SHARING OF WILD FOODS

Sharing of subsistence resources is a key cultural value in all the study communities. As noted above, sharing declined immediately after the spill and then gradually recovered, as shown by the average number of resources received and given per household. As shown in Figure VII-38, in the view of many households, sharing in 1991, 1992, and 1993 occurred at levels below those prior to the spill. In 1998, survey respondents were again asked to assess sharing of subsistence resources in the study year (in this case 1997/98) with levels before the oil spill. In no study community did a majority of households say that sharing was lower in 1997/98 than before the oil spill. However, in all but one community (Chenega Bay), 25 percent or more of the households said that sharing was indeed down from before the spill. For the combined population of all study communities, 28.1 percent stated that sharing was down from ten years ago. The rest said sharing was higher (24.2 percent) or about the same (47.8 percent).

It is difficult to discern any clear pattern in assessments of sharing across communities in comparing the 1997/98 results with those of other years. Chenega Bay is most notable in the sharp decline in the percentage of households for whom sharing is lower than before the spill. There was also a sharp decline in Tatitlek compared to 1993. On the other hand, percentages have held steady in several other communities (Nanwalek, Old Harbor, Ouzinkie, Port Graham), and were higher in Larsen Bay in 1997/98 than in either 1992 or 1993.

Most respondents gave economic or personal reasons for <u>increased</u> sharing (see discussion in Fall and Utermohle 1999). These included such factors as a change in family size, income, or employment, or more interest or effort. Economic, personal, and environmental factors were most

Figure VII-37. Percentage of Tatitlek Residents Who Participated in Any Subsistence Harvest Activity

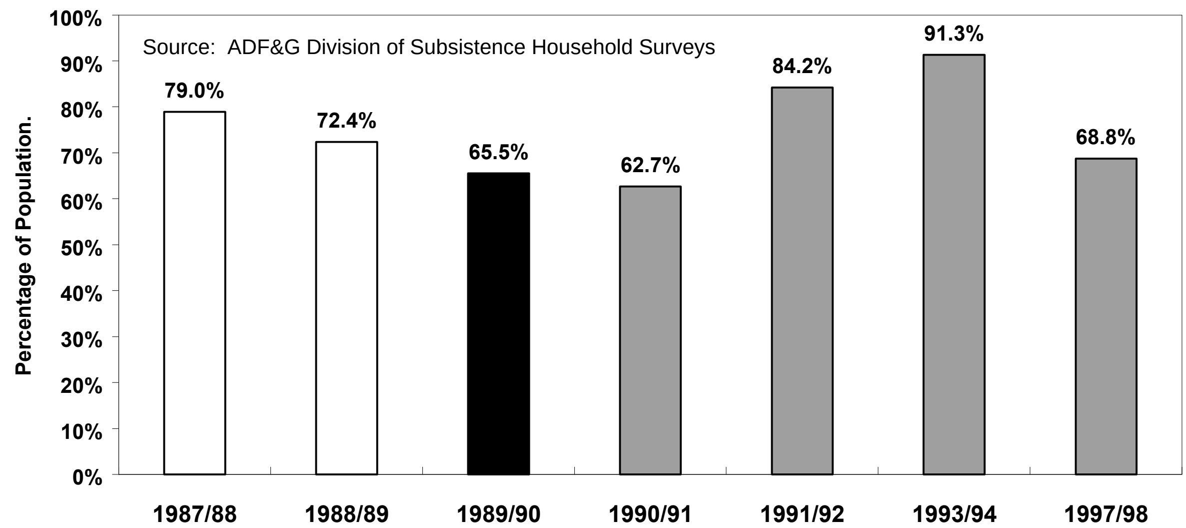
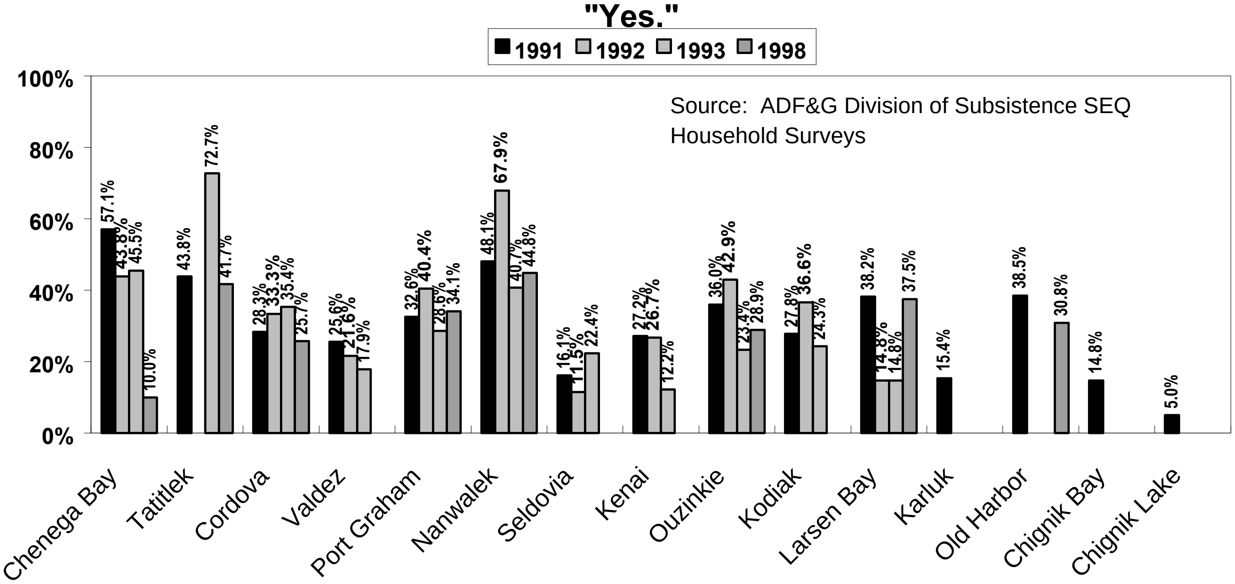


Figure VII-38. Has There Been Less Sharing of Wild Resources Since the *Exxon Valdez* Oil Spill? Percentage of Respondents Answering "Yes."



frequently offered as reasons for <u>decreased</u> sharing. The latter includes lower harvests due to resource scarcity. Case VII-4 provides some representative comments. Only two households (one in Nanwalek and one Ouzinkie) said that sharing had decreased due to oil contamination.

Case VII-4. Why is there less sharing now than 10 years ago?

Sample responses in 1998:

We don't get that much now. We used to receive more. People aren't stingy; it's just hard to get the foods. [Port Graham]

Everything was more plentiful then. We get just enough for ourselves now. [Old Harbor]

Because I'm working full time and don't have the opportunity to share and visit with my elders like I did in the past. I still share, but not as much as I used to when I had more leisure time. [Cordova]

QUALITATIVE HOUSEHOLD ASSESSMENTS OF RECOVERY, 1989 – 1998

Post-spill recovery of subsistence uses can also be examined at the household level using the qualitative assessments provided by harvest survey respondents. At the subregional level, households' assessments for 1990/91 (the second post-spill year) were consistent with estimated changes in subsistence harvest levels: most respondents in the Lower Cook Inlet and Kodiak villages reported that harvests increased compared to the previous year, but Prince William Sound respondents generally reported further declines (Fig. VII-39).

Also consistent with the quantified harvest data, most households in the Prince William Sound and Lower Cook Inlet communities (96.9 percent and 85.2 percent, respectively) said that subsistence uses in 1990/91 remained below pre-spill levels (Fig. VII-40). In the Kodiak Island communities, about half the respondents said subsistence uses remained lower, reflecting the more rapid rebounding in that subregion than in Prince William Sound.

As shown in Figure VII-41, by 1998 the percentage of households reporting lower subsistence uses than before the spill was notably lower than in the first two post spill years. The drop in Chenega Bay and Tatitlek was especially notable, compared even with 1993/94, probably reflecting the relatively high subsistence harvests that took place in both communities in 1997/98 (Fall and Utermohle 1999). While in none of the eight study communities in 1998 did a majority report lower overall subsistence uses than before the spill, a substantial percentage in many of them (a third or more in all communities but Chenega Bay and Tatitlek) said that compared ten years ago, subsistence harvests were down.

Figure VII-39. Households' Assessments of Overall Levels of Subsistence Uses in 1990/91 Compared to the Previous Year, 1989 (the Year of the Oil Spill), by Subregion

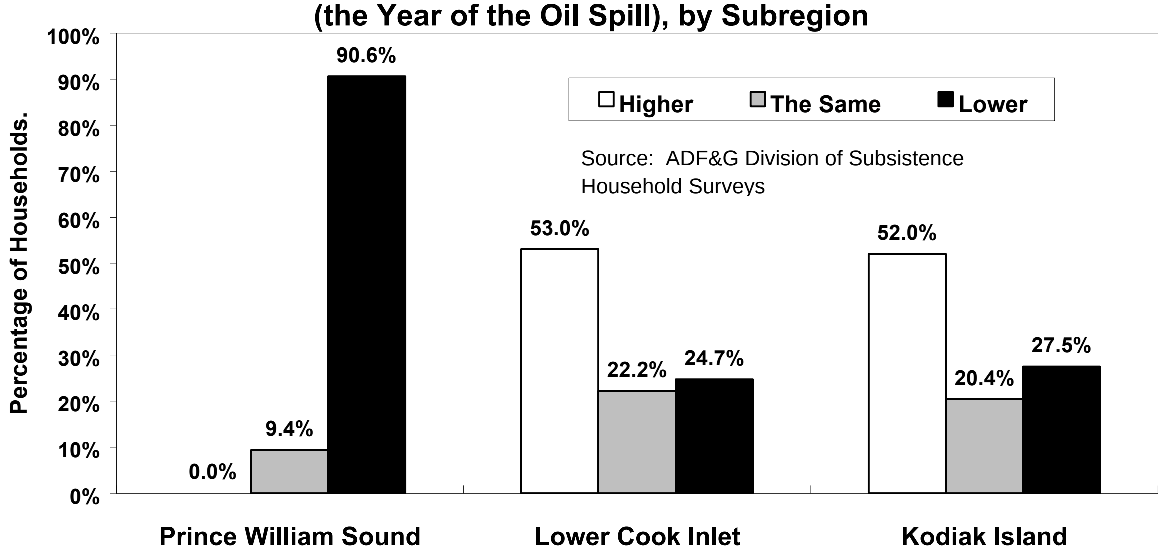


Figure VII-40. Households' Assessments of Overall Levels of Subsistence Uses in 1990/91 Compared to Before the *Exxon Valdez* Oil Spill, by Subregion

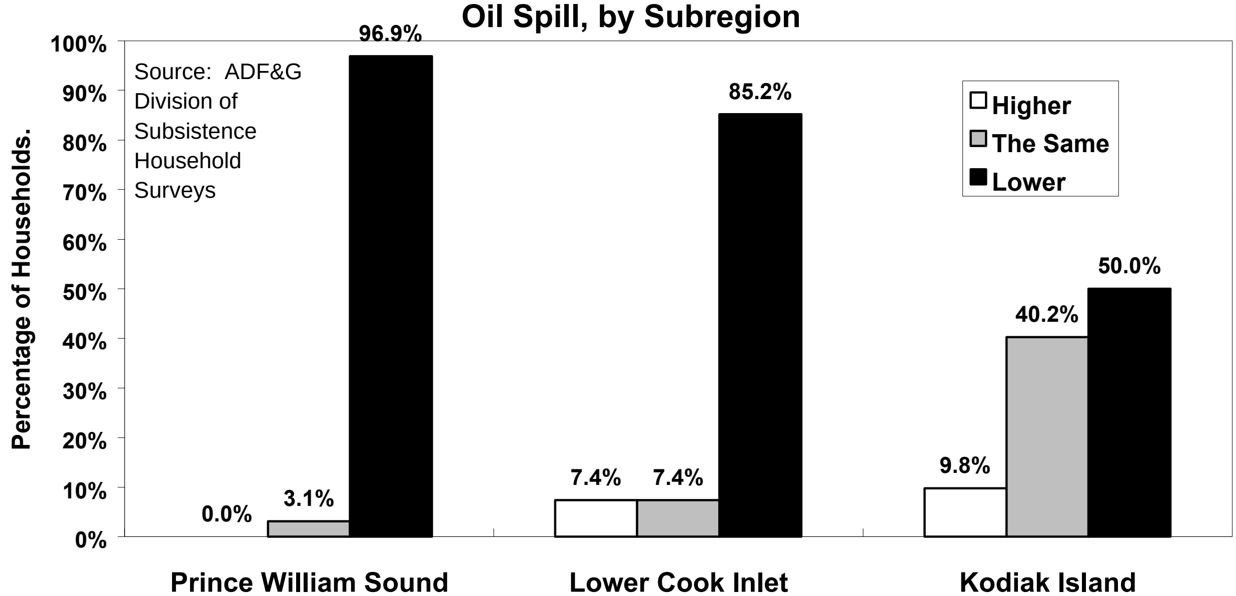


Figure VII-41. Percentage of Households Reporting Lower Subsistence Uses in the Study Year than Before the *Exxon Valdez* Oil Spill (Any Reason)

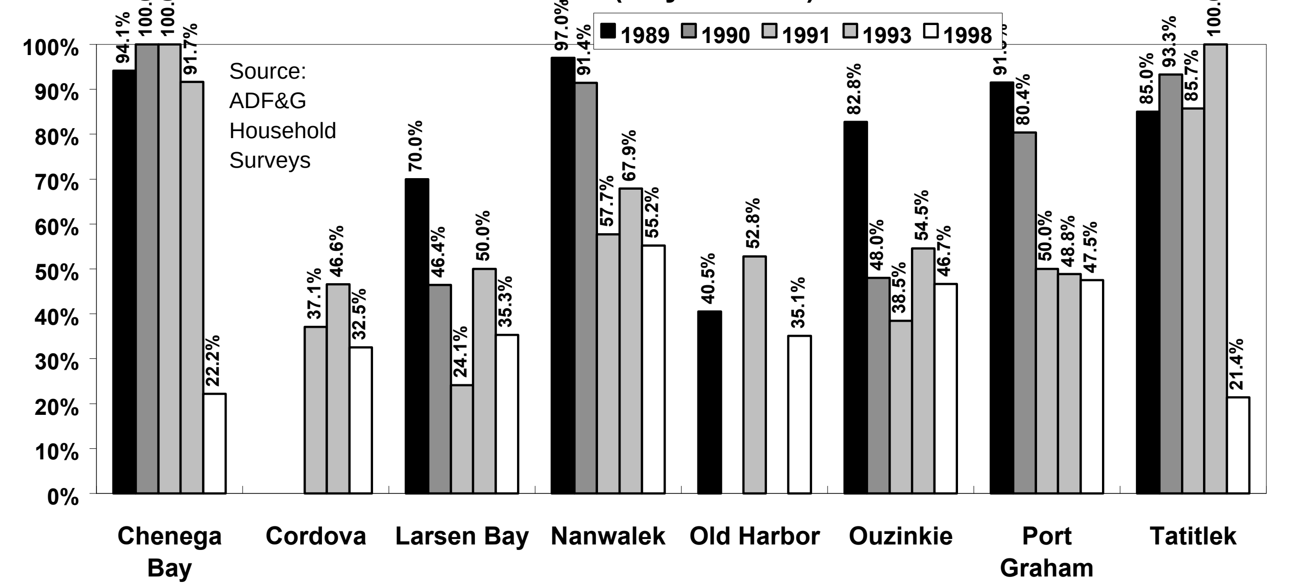
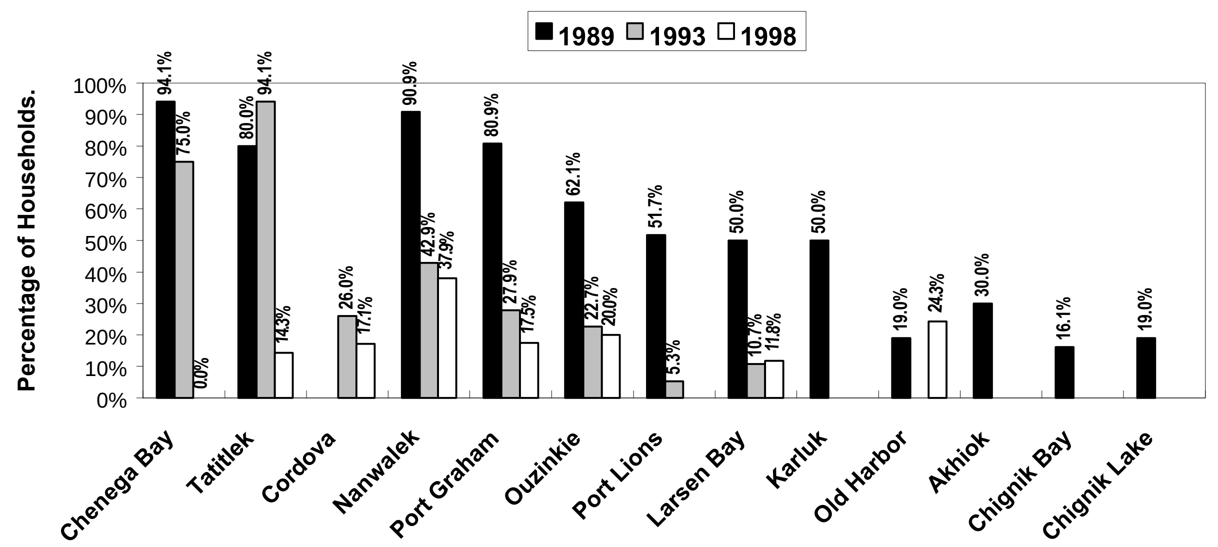


Figure VII-42. Percentage of Households Reporting Lower Overall Uses of Wild Resources Due to the Oil Spill



However, as shown in Figure VII-42, over time, fewer households in all communities (with the exception of Old Harbor, where the spill was never the prevailing explanation of changes) have pointed to the spill as a cause of lower overall subsistence uses. Particularly notable has been the decline at Chenega Bay and Tatitlek, where by 1998, no households and just 14.3 percent of households, respectively, blamed the spill for an overall decline in subsistence uses.

On the other hand, as shown in Figure VII-43, oil spill reasons persisted as explanations of changes in uses of particular subsistence resources at a relatively high level. Indeed, in 1998 more than half of the respondents in Tatitlek, Nanwalek, Port Graham, Old Harbor, and Ouzinkie, and 57.4 percent of respondents in the combined seven villages, cited the oil spill as a reason for lower uses of at least one kind of subsistence food. Case VII-5 provides some examples of these spill-related reasons for lower uses, as well as some spill-related reasons for increased subsistence uses.

Case VII-5. Spill Related reasons for Changes in Subsistence Uses, 1998

Reasons for lower uses:

My kids are gone. There is no work here for them. It all ties in together and is due to the spill. [Cordova]

We have a diminished effort to go out and get it. The spill made us hesitant to harvest animals that may have been affected by the spill. [Cordova]

We don't trust anything since the oil spill. [Nanwalek]

Because lots of sea things are less. [Nanwalek]

Some are damaged, like clams, and some we can't get enough of, like seals. [Old Harbor]

In part it was oil spill related to some kinds of animals, but some were just hard to get or there was no time or no transportation to get them. [Ouzinkie]

There are less animals and fear of toxins. [Ouzinkie]

Reasons for higher uses:

Because the threat to subsistence of almost losing it gives me more of an urgency to harvest. [Port Graham]

There's more people to feed and cash reserves are much less. [Cordova]

Figure VII-43. Percentage of Households with Reduction in Any Subsistence Resource Due to Oil Spill Reasons

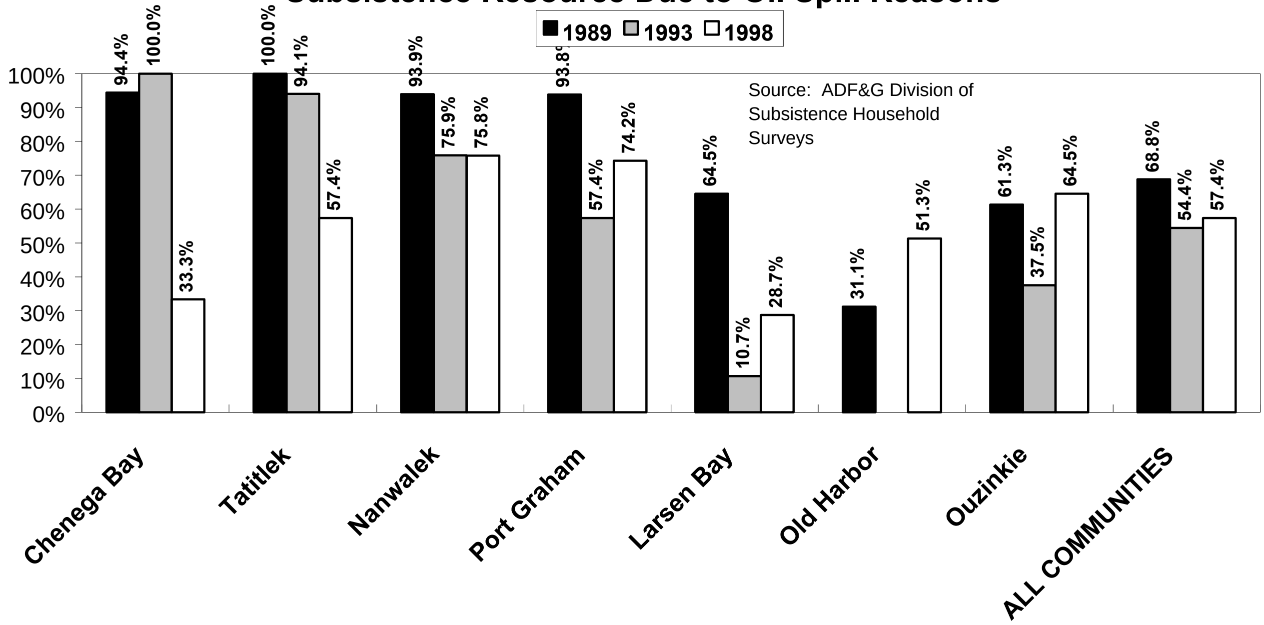
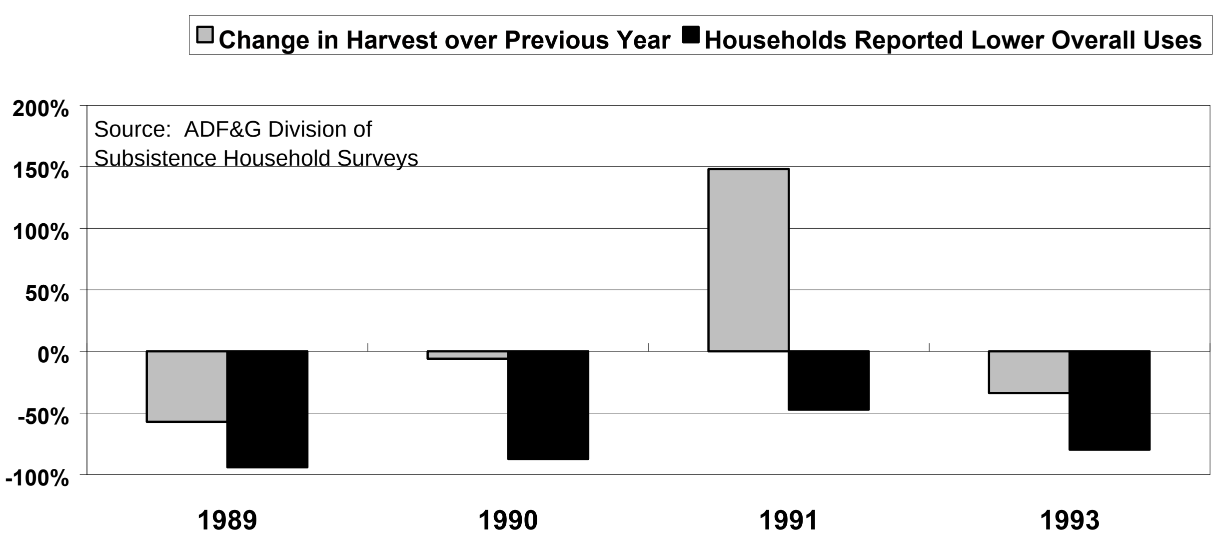


Figure VII-44. Chenega Bay: Percentage Change in Subsistence Harvest Compared to Percentage of Households Reporting Lowered Uses



It is important to note that the perception of declining subsistence harvests and uses lingered in several villages despite rebounding uses and harvests. Although assessments generally matched the pattern of recovery in the second post spill year, this was not the case in subsequent years. In Figure VII 44 and Figure VII-45, the percentage of households reporting lower uses is depicted as a negative value, to correspond with the direction of the harvest estimate if lower. The goal of these figures is to compare the consistency of the direction assessments of subsistence with the direction and dimension of changes in estimated subsistence harvests.

In Chenega Bay (Fig. VII-44), in 1989 subsistence harvests dropped by more than half, and virtually all households reported that their harvests were down. In 1990, harvest dropped slightly from the year before and again most households reported a decline. The results for 1991 were contradictory. Compared to 1990, harvests were up 150 percent, but half the households said they believed their uses were even lower than in 1990. In 1993, harvests diminished compared to 1992 and once again, most households said that their uses were lower than the year before.

Results in Nanwalek were even more inconsistent over time (Fig. VI-45). As in Chenega Bay, assessments matched changes in harvest estimates in 1989: harvests were down 50 percent and most households said their subsistence uses had declined. But over the next three study years for which assessment data are available, despite consistent increases in subsistence harvests year by year, a growing percentage of households said that their uses were down compared to the year before.

Reasons for these discrepancies are unclear. First, it should be noted that the assessments are reported in terms of household activity, while the changes in harvests are based on community totals. A few key households with large harvests can substantially influence community totals despite lower than average harvests by most families. Arguing against this explanation is the increased average number of resources used, attempted to harvest, and received in these communities, all suggesting a community-wide increase in subsistence uses over time. Another, more likely, explanation is that the perception of declines in subsistence harvests and uses since the spill is a consequence of a general view of continuing injury, rather than a focus on the volume of harvests themselves. Another explanation is that perceptions of lower uses reflect assessments of a greater effort in time and money needed to achieve desired levels of harvests than before the spill, a topic discussed in the next section.

HARVEST EFFORT[1]

Earlier summaries of post-spill subsistence activities noted that key harvesters were reporting that they were expending more effort, in terms of time, distance traveled, and money, to achieve subsistence harvests than before the spill (e.g., Seitz and Miraglia 1995). Respondents reported that more effort was

[1] This section is based primarily on Fall and Utermohle 1999:43-50

Figure VII-45. Nanwalek: Percentage Change in Subsistence Harvest Compared to Percentage of Households Reporting Lowered Uses

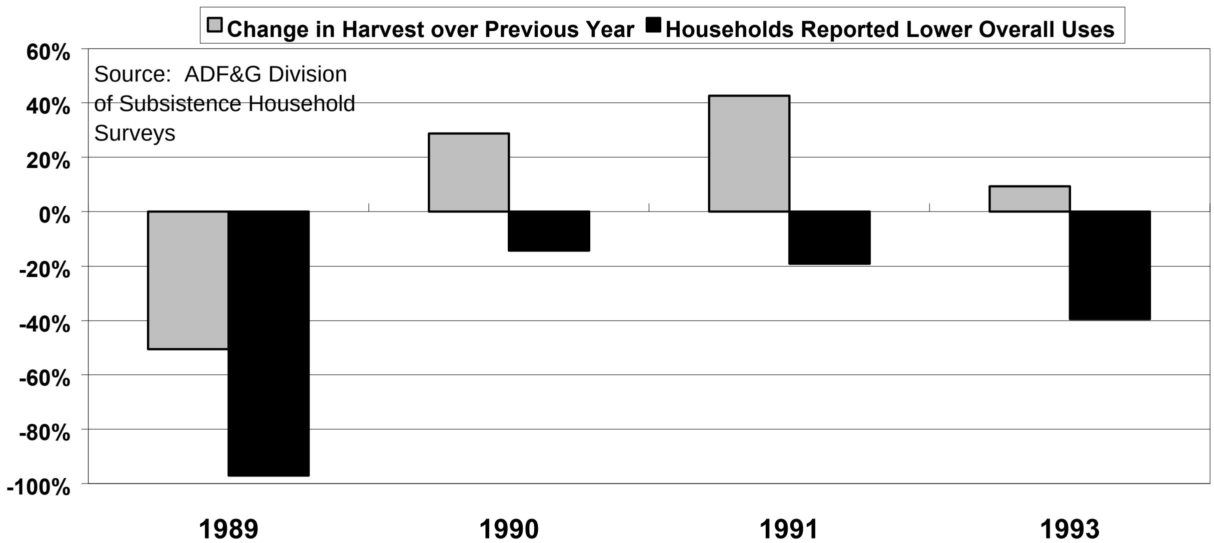
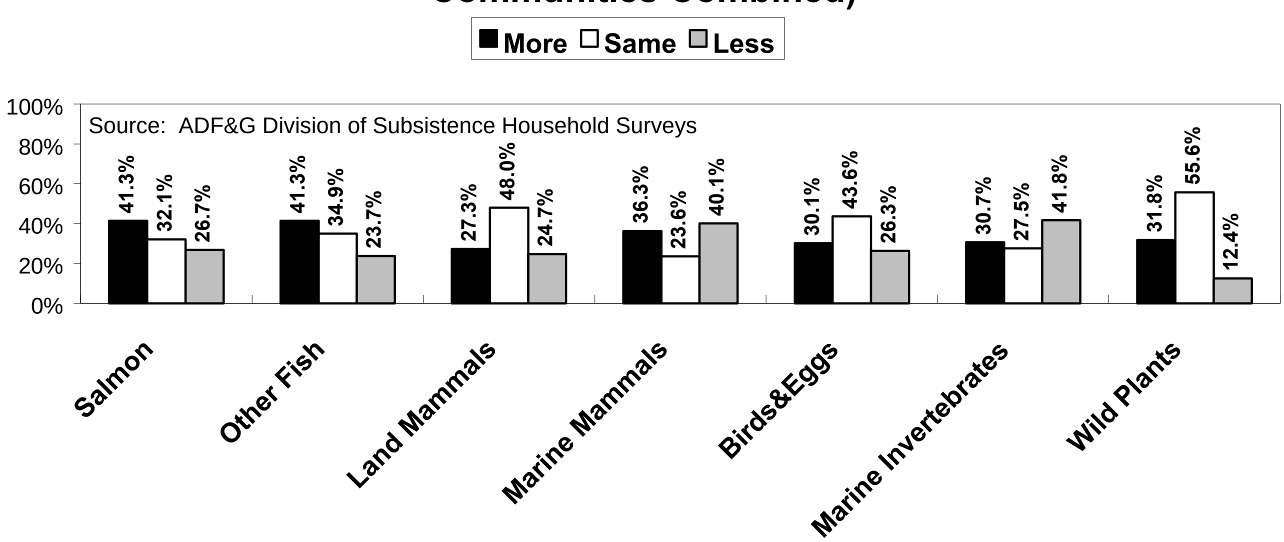


Figure VII-46. Assessment of Effort to Harvest Resource Categories in 1997/98 Compared to 10 Years Ago (All Communities Combined)



needed because certain resources, such as marine mammals, birds, and marine invertebrates, were scarce. Until 1998, interviews did not systematically investigate assessments of harvest effort.

Analysis of changes in subsistence harvest effort is complex because of the multiple factors that may affect it. Some key factors, such demography, may have no relationship to natural resource status. For example, as households grow, harvesters may invest more effort to support their families. The converse is also true: as households mature and children establish their own homes, aging parents may spend less time in subsistence activities and come to depend on the harvests of their offspring. Case VII-6 gives some examples from responses to questions about effort in the survey conducted in eight spill area communities in 1998 (Fall and Utermohle 1999:44-50).

Case VII-6. Reasons for Changing Subsistence Harvest Effort, 1998

<u>The first set explains increased effort.</u>

My household grew larger and our needs increased. [Old Harbor]

There are now more people in the family to feed. [Cordova]

I was a single man in 1988 and a married man in 1998. [Cordova]

I have a boat now to do it with. I troll more than we did ten years ago and it starts earlier for you, year round. [Port Graham]

I'm married and have kids. We need more food. I have to subsist because there's no jobs around here. [Nanwalek]

<u>This second set explains decreased effort.</u>

I'm getting old. I'm getting smarter. I know where they [deer] go. I have the means. I have fewer kids. [Chenega Bay]

I'm making less money and have to do other jobs to make money [so there's] less fishing. [Cordova]

My son provides, so I don't go hunting that much any more. [Cordova]

Less effort because the household is smaller. The younger generation is going after it more. [Port Graham]

As shown in some of the examples in Case VII-6, some economic factors may contribute to more or less subsistence effort depending upon other circumstances. For example, subsistence harvesting requires money. In some cases, increased household income may lead to higher subsistence harvests as households invest in better equipment and are able to afford supplies such as gasoline and ammunition. On the other hand, jobs may take time away from subsistence activities, resulting in less effort and more reliance on purchased foods. Here are some examples of both from respondents' explanations of why their effort has changed.

Even changes to the status of natural resource populations may have opposite effects on harvest effort. On the one hand, scarce resources and consequently diminishing success may discourage some hunters from attempting further harvests (less effort). On the other hand, other hunters faced with diminishing returns may invest more effort to achieve their accustomed level of harvest. Increasing resource populations can result in less effort as harvesters may achieve their desired harvest levels with less time and money, or in more effort if harvesters take advantage of such increases to harvest more to share or to substitute for other resources. Some examples appear in Case VII-7.

Case VII-7. Resource Abundance as a Cause of More and Less Effort, 1998

I have to spend more time for less resources. [Cordova]

I'm spending more time because the resource is less abundant and there are more locals fishing. [Cordova]

There's more effort now because there are fewer fish. I have to go to new areas like Windy Bay. [Port Graham]

A lot more effort [to hunt seals]. When I was growing up there used to be seals right here in front of the village. [Old Harbor]

There's not as many halibut available, so I don't try to make the effort. [Cordova]

There's less seals available, so I put in less effort. [Chenega Bay]

They [seals] are getting more scarce and it's hard to find them [so hunting less]. [Nanwalek]

Figure VII-46 reveals a mixed assessment of effort in 1998 compared to 10 years before, depending upon the resource category. Consistent with data on the composition of the subsistence harvest, the most households in the eight communities combined reported increased effort to harvest salmon (41.3 percent) and other fish (41.3 percent). At the community level, the largest percentage of households in Chenega Bay, Cordova, and Tatitlek reported more effort to harvest salmon in 1998 than ten years before, with 30 percent or less of the households in each community saying that salmon harvest effort had decreased. The most households in Chenega Bay, Cordova, Nanwalek, Larsen Bay, Old Harbor, and Ouzinkie said their effort to harvest fish other than salmon had increased over ten years ago. Only in Port Graham did the most households say effort had decreased (Fall and Utermohle 1999:46).

Salmon enhancement efforts have taken place near Tatitlek and Chenega Bay and while respondents gave high ratings to these projects (Fall and Utermohle 1999:71), just two households in Chenega Bay and none in Tatitlek attributed increased harvest effort to a greater availability of salmon. More common were personal reasons such as “I put up more because I want more” [Chenega Bay] and reasons related to scarcity such as “I had to travel farther, spend more on gasoline and equipment, and face more competition” [Tatitlek]. Regarding other fish, explanations for increased effort focused on scarcity and increased competition. A Cordova resident said, “I am spending more time [fishing] because the resource is less abundant and there are more locals fishing.” A Chenega Bay resident remarked, “There’s increased tourism and increased competition.” A Tatitlek man explained, “Gas is expensive and we needed more because we had to travel further.”

In contrast to the Prince William Sound communities, in both Nanwalek and Port Graham in 1998 assessments were split regarding salmon harvest effort, with about as many households in each community saying effort to harvest salmon had increased as saying that effort had decreased. Very few households said that effort was similar to ten years ago. Accounting for increased effort in part are salmon enhancement projects:

> Some species are more abundant. The hatchery has caused more of a return of pink salmon. And we’re spending more time because the boys are going out fishing more. [Port Graham]

At a workshop in January 1999 held to review the findings of the 1998 interviews (Fall and Utermohle 1999:18), Port Graham and Nanwalek participants suggested that decreased salmon harvest effort for some households was due to demographic factors such as smaller household size and older key harvesters.

Looking specifically at assessments of effort to harvest marine mammals in 1998, in all communities combined there was a split pattern, with about as many households reporting increased effort as reporting decreased effort (Fall and Utermohle 1999:48). It appears that particular communities and hunters have responded to marine mammal scarcities in different ways. For example, in Port Graham, most hunters have reduced efforts, probably because of diminishing returns, while in neighboring Nanwalek, most hunters have responded to scarcities by increasing their effort to harvest marine mammals. Scarcities have evidently discouraged hunters in Ouzinkie, while Old Harbor hunters have tried harder to locate and harvest marine mammals. Case VII-8 presents some explanations for changes in harvest effort for marine mammals. (See additional examples in Case VII-7.)

Consistent with declining harvests of marine invertebrates in several study communities, a plurality of households in the eight communities combined in 1998 reported less effort to harvest shellfish than ten years before (41.5 percent) (Fig. VII-46). At the community level, declines in shellfish harvest effort were particularly notable at Tatitlek (36.4 percent of households with lower effort), Cordova (43.4 percent), Port Graham (54.5 percent), and Ouzinkie (71.4 percent). Surprisingly, given the drop in harvest levels and concerns about PSP, 70.0 percent households in Larsen Bay said their harvest effort for marine invertebrates had not changed, and most households in Old Harbor (63.0 percent) and Nanwalek (70.8 percent) reported increased effort (Fall and Utermohle 1999:48).

Explanations for decreased effort to harvest shellfish in 1998 focused on scarcity of marine invertebrate populations and safety issues related to PSP and other sources of contamination. Regarding increased effort to harvest shellfish, explanations were varied, but focused on scarcity, competition, and a continued desire to use these traditional resources. Case VII-9 provides examples.

Case VII-8. Reasons for Changes in Marine Mammal Hunting, 1998

Reasons for decreased hunting:

The oil spill damaged the seals. [Chenega Bay]

There weren't that many seals and I am afraid of the effect the oil had on them. [Port Graham]

They just didn't recover from the oil spill. [Tatitlek]

They are getting more scarce and it is hard to find them. [Nanwalek]

You hardly ever see a seal around to shoot, so I don't try anymore. [Ouzinkie]

Reasons for increased hunting:

Some of the animals have moved out someplace and the cost of living has gone up. [Nanwalek]

I have to travel further, and then you're not sure you will catch anything. [Ouzinkie]

We need more seal oil. Everyone goes farther out to get it. [Port Graham]

More young boys are going after them from here in the village. [Old Harbor]

I wanted the challenge and someone offered to teach me to hunt. [Nanwalek]

It's more expensive to go to town for meat. It's cheaper to go out here and hunt seals. [Chenega Bay]

Case VII-9. Reasons for Decreased & Increased Harvest Effort for Shellfish, 1998

<u>Reasons for decreased effort to harvest shellfish</u>

I don't even try anymore because there's nothing left. [Cordova]

There's less desire [to use] because of concern about the oil spill and other contaminants. It seems like it was just last year that the spill happened. [Nanwalek]

Due to the PSP poisoning warning. [Nanwalek]

Some of the animals that were commonly on my table have ceased to be there due to health concerns over eating some species. [Ouzinkie]

Because of sea otters, because they're protected. [Cordova]

They are not safe to eat. Besides, there are fewer of them. [Ouzinkie]

<u>Reasons for increased effort to harvest shellfish:</u>

There's less resource because of oil murder. [Chenega Bay]

We have to go farther to get more. There are fewer around the beach. Have to go to Dogfish Bay also. [Nanwalek]

Kids like this seafood. It's harder to find and we have to travel farther. [Nanwalek]

There's less resource available and I'm looking for more places to find them. We need more because we grew up on it. There's a lot of competition. [Cordova]

I teach and I want my kids to eat these foods. [Port Graham]

I have more time available now. I've had to buy octopus more. I go farther away to harvest than my normal spots. I have more of a need for it because of a craving for it. [Port Graham]

HOUSEHOLD EMPLOYMENT IN THE WAGE-COMMERCIAL SECTOR, POST-SPILL EFFECTS

As an economic strategy, it was feasible for households in Alutiiq villages nearest the oil spill to reduce wild food harvests in the oil spill year. It was economically feasible because households were able to divert household labor into the wage-market sector. This economic strategy is a common one in mixed subsistence-cash economies. In Alaska Native villages, households may respond to short-term contractions in the subsistence sector by expanding activities in the local wage-market sector. A common way to accomplish this is to transfer the labor of household members between economic sectors. Income from expanded employment of household members in the wage-market sector is used to purchase store foods, which serve as replacements for wild foods in short supply. It is a household strategy that predates the oil spill.

As a general economic strategy during the oil spill crisis, households in Alutiiq villages diverted household labor into the wage-market sector as a way to deal with immediate shortfalls in wild foods from the subsistence sector. Doing this was possible because of the large number of short-term employment opportunities for local, unskilled labor created by spill cleanup efforts. The spill cleanup created jobs for about 11,000 workers in 1989 (see Chapter Six). By taking oil spill cleanup work, households earned an unusually large amount of monetary income the year of the spill – a single-year "windfall" cash infusion into households of many spill area communities. In communities of Prince William Sound, Lower Cook Inlet, and Kodiak Island, oil spill cleanup jobs accounted for between 40 percent and 80 percent of the earned income in 1989, outstripping commercial fishing, the traditional major source of cash (Fig. VII-47, Fig. VII-48). (See also Table VI-1 and VI-2 in Chapter Six.)

As a household strategy to deal with reduced wild food harvests, work in the commercial-wage sector was a short-term solution. Income-earning opportunities in spill-cleanup programs were generally short-lived. Few cleanup jobs were available near Nanwalek and Port Graham after 1989, where household monetary incomes fell back to low pre-spill levels (Fig. VII-49). The same pattern is evident in Tatitlek (Fig. VII-50). The pattern is similar in the Kodiak Island Borough communities of Karluk, Larsen Bay, and Ouzinkie (Fig. VII-51). The volatility in household earnings from oil spill employment is illustrated further in Figures VII-52 and VII-53, which compare earnings by employment type in 1989 and 1990/91. In every community, spill-related income was much reduced in the second post-spill year. Only in Chenega Bay did oil spill cleanup employment continue to make significant contributions after the first year (in 1990 and 1991) (see Fig. VII-50). While increased employment was short-lived for households everywhere but Chenega Bay, household subsistence harvests remained depressed for a longer period of time.

Household incomes from commercial fishing also appear to have declined in communities nearest the spill, based on household surveys (Figs. VII-49 to VII-51). These declines appear to be most prevalent in Alutiiq villages with small-scale commercial fisheries with the lowest historic earnings per permit (see Chapter Four). Figure VII-54 also suggests a major decline in commercial fishing income in Cordova in 1991 in comparison with 1985 and 1988. These trends were evident before the oil spill (see Chapter Four).

While cleanup work dried up as a source of income for households from one to three years after the spill, a new type of employment in spill restoration emerged in some spill area communities. Oil spill restoration programs offered a new potential source of monetary income for some households. (See Figure VI-2 in Chapter Six, as well as Table VI-6 and Table VI-7.) As discussed in Chapter Eight, oil spill restoration work offered an additional potential benefit through the development of economic

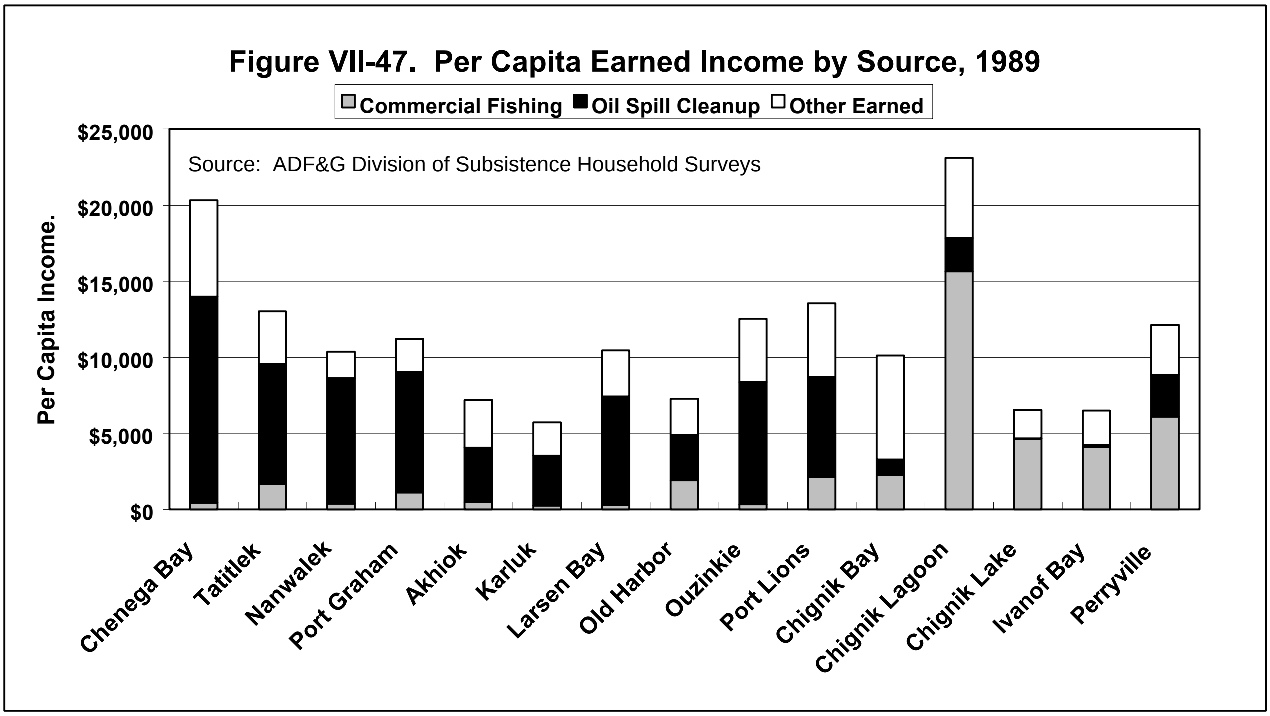


Figure VII-47. Per Capita Earned Income by Source, 1989
Commercial Fishing
Oil Spill Cleanup
Other Earned
Source: ADF&G Division of Subsistence Household Surveys
Per Capita Income.
$25,000
$20,000
$15,000
$10,000
$5,000
$0
Chenega Bay
Tatitlek
Nanwalek
Port Graham
Akhiok
Karluk
Larsen Bay
Old Harbor
Ouzinkie
Port Lions
Chignik Bay
Chignik Lagoon
Chignik Lake
Ivanof Bay
Perryville

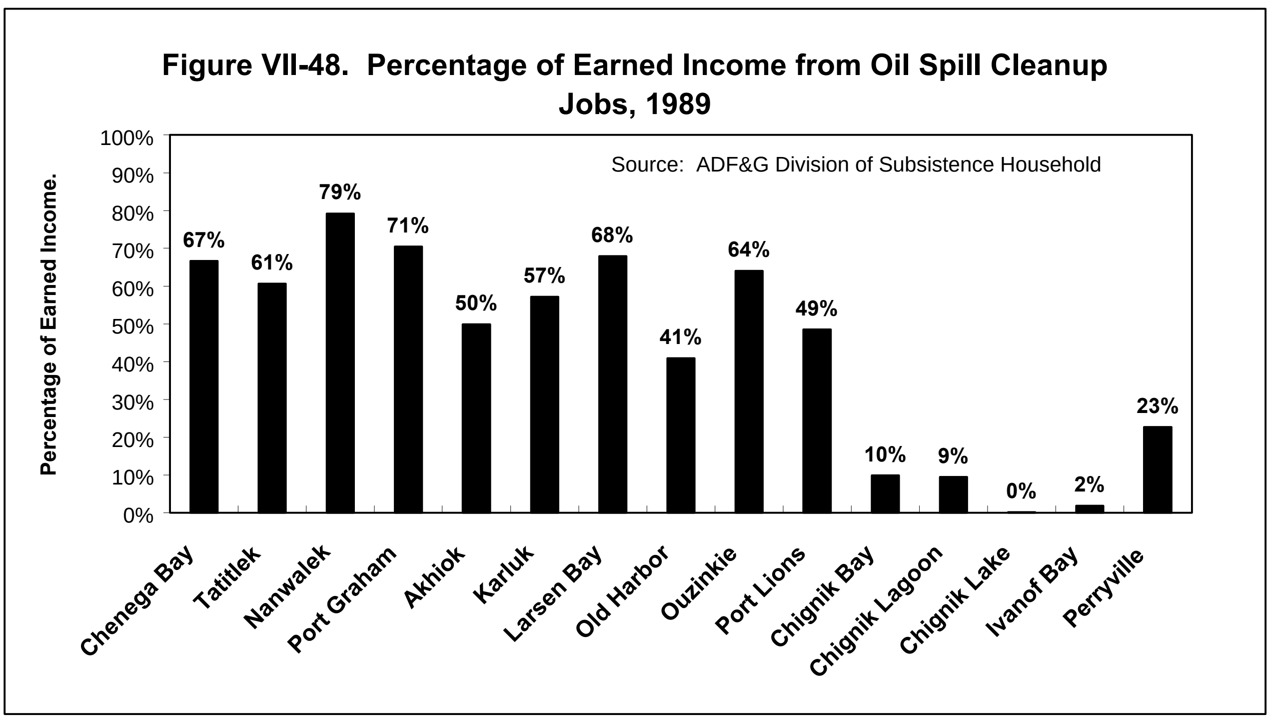


Figure VII-48. Percentage of Earned Income from Oil Spill Cleanup Jobs, 1989
Source: ADF&G Division of Subsistence Household
Percentage of Earned Income.
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
67%
61%
79%
71%
50%
57%
68%
41%
64%
49%
10%
9%
0%
2%
23%
Chenega Bay
Tatitlek
Nanwalek
Port Graham
Akhiok
Karluk
Larsen Bay
Old Harbor
Ouzinkie
Port Lions
Chignik Bay
Chignik Lagoon
Chignik Lake
Ivanof Bay
Perryville

Figure VII-49. Per Capita Earned Income, by Source, Nanwalek and Port Graham

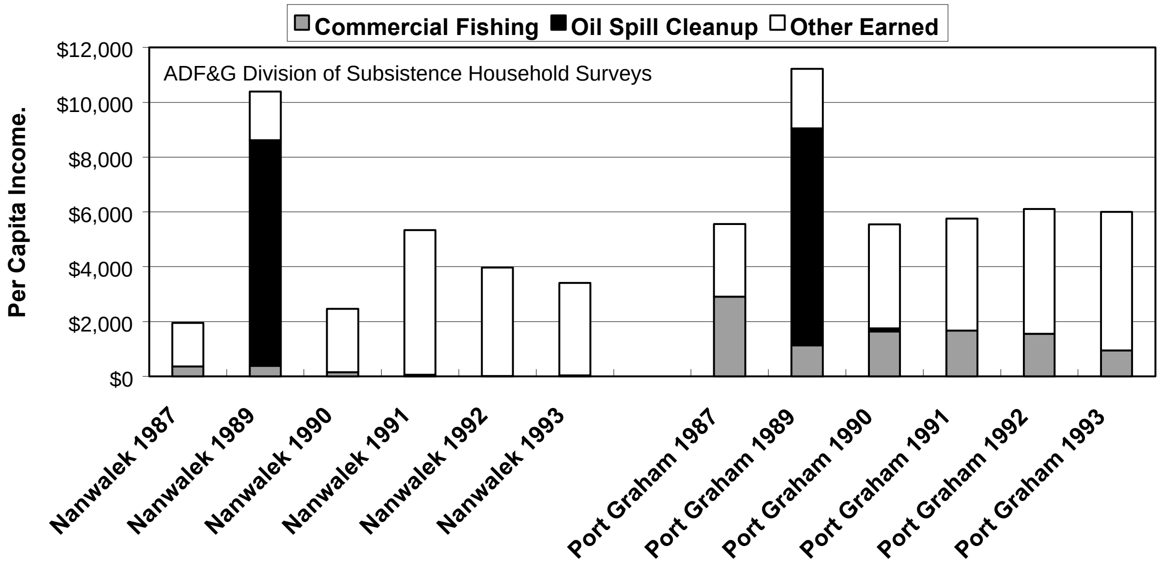


Figure VII-50. Per Capita Earned Income by Source, Chenega Bay and Tatitlek

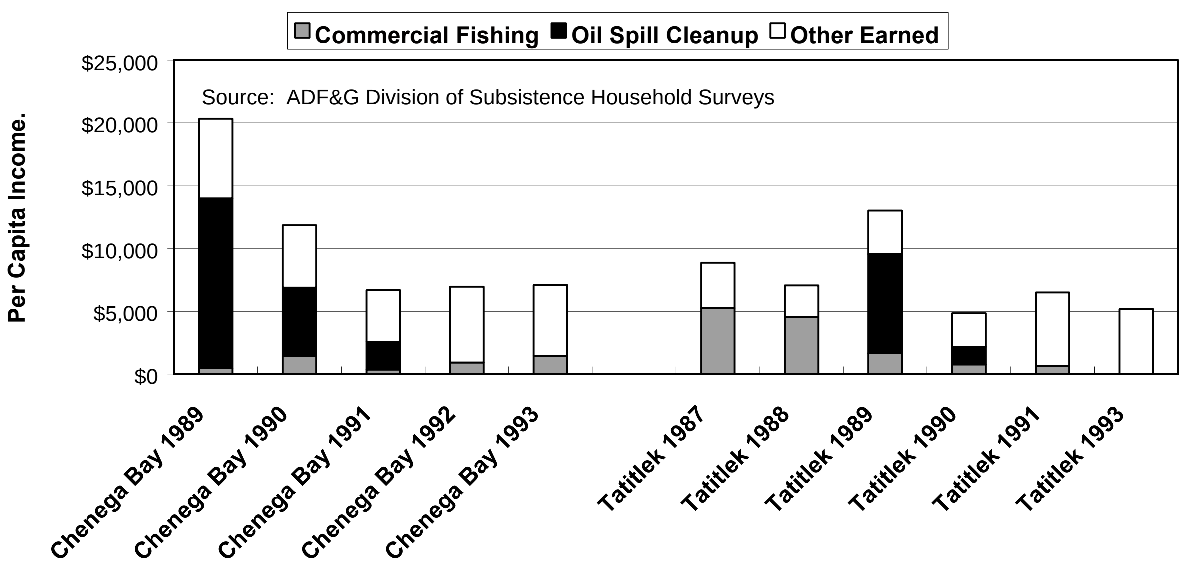


Figure VII-51. Per Capita Earned Income by Source, Karluk, Larsen Bay, and Ouzinkie

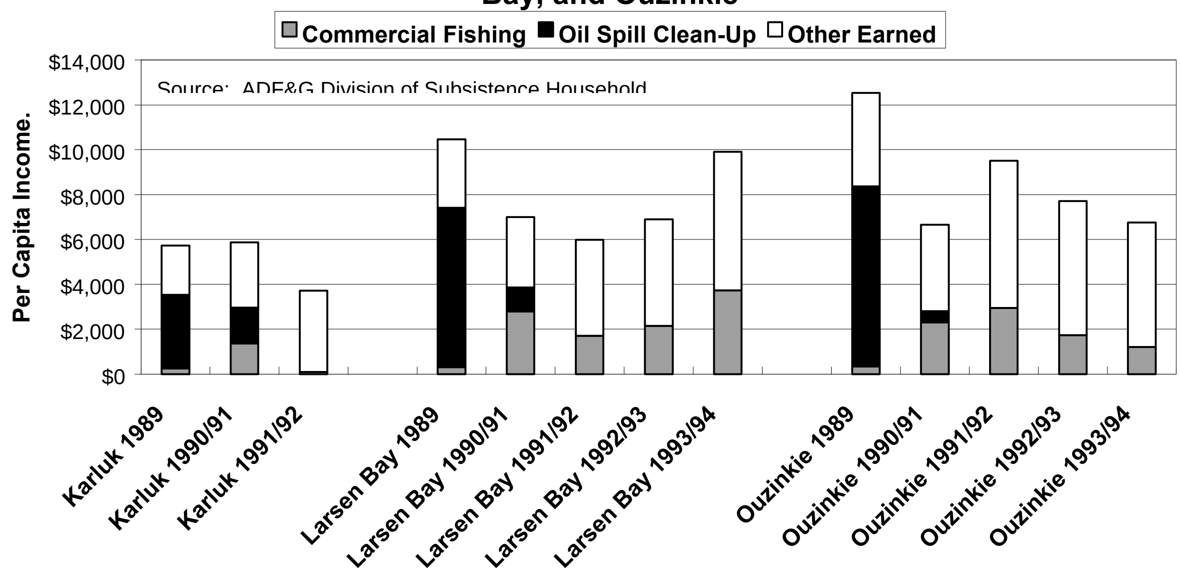


Figure VII-52. Per Capita Earned Income by Source, 1990/91

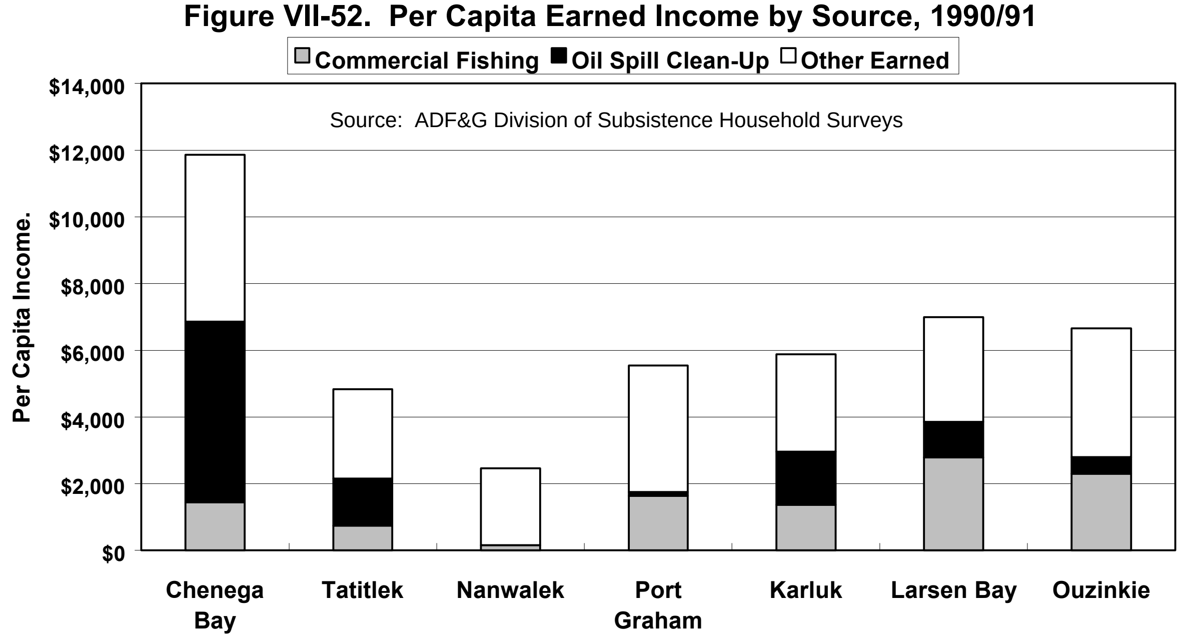


Figure VII-53. Percentage of Earned Income from Oil Spill Cleanup Jobs, Study Communities, 1989/90 and 1990/91

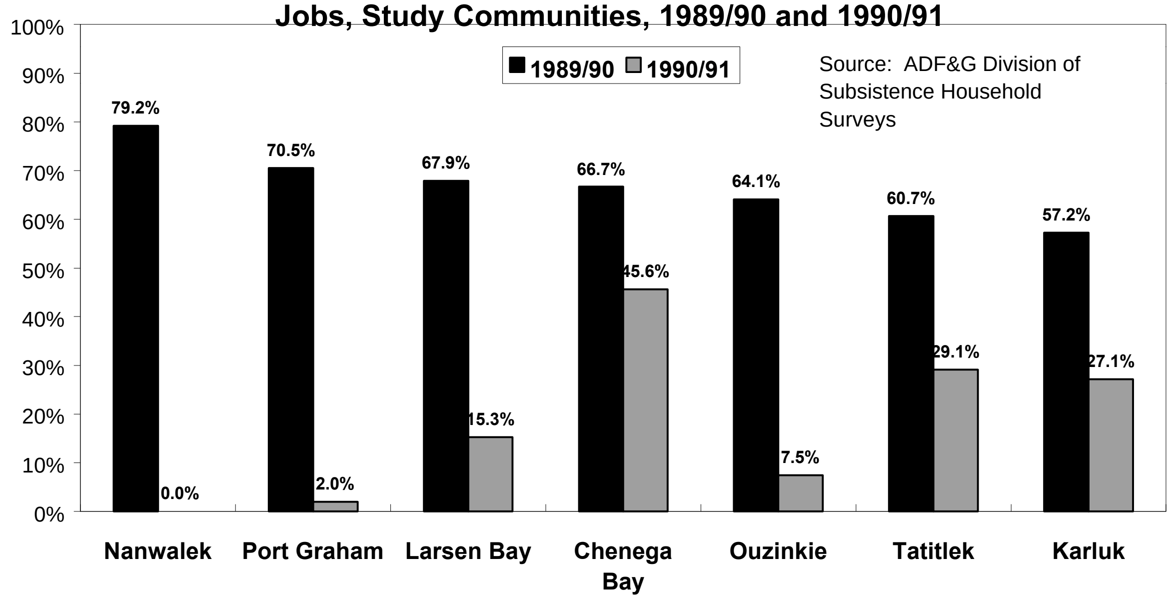
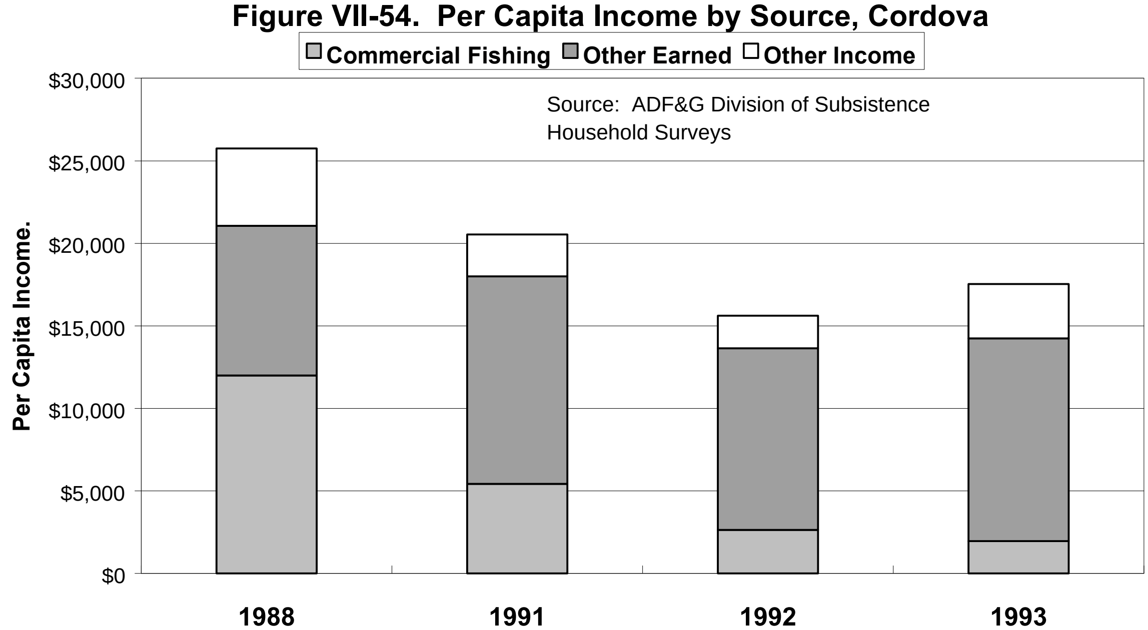


Figure VII-54. Per Capita Income by Source, Cordova



infrastructure. Examples include capital improvement projects funded through the criminal settlement subsistence restoration program, resource enhancement and community involvement projects funded by the EVOSTC, and purchases of land and use rights from Native Corporations through the EVOSTC's habitat protection program. Land sales have produced both short-term payments as well as investments for long-term dividends (e.g., Mishler 1999, Mishler 2001). A major question is how these new sources of cash might support or erode features of mixed subsistence-cash economies. We return to this question in Chapter Eight.

YOUNG ADULTS' INVOLVEMENT IN SUBSISTENCE ACTIVITIES

Are Young Adults Learning Enough Subsistence Skills?

The EVOS Trustee Council overview on the status of subsistence services in 1996, about seven years after the spill (EVOSTC 1996a:20), stated that, "There is particular concern that the oil spill disrupted opportunities for young people to learn subsistence culture, and that this knowledge may be lost to them in the future." When interviewed in 1992 with the SEQ, most respondents in all the study communities but Old Harbor said that young adults were not learning enough subsistence skills. For the eight communities that were restudied in 1998, only 38.8 percent of households in the combined communities in 1992 had said yes, young adults were learning the necessary skills (Fig.VII-55).

In 1998, the same question was asked to detect any changes in assessments of the passing on of subsistence skills to young people (Fall and Utermohle 1999:83-86). As shown in Figure VII-56, in only three communities (Chenega Bay, Larsen Bay, and Old Harbor) did a majority answer "yes" to this question. Overall, just under half (48.0 percent) said yes, although just over half (50.5 percent) of the seven smaller communities (excluding Cordova), said yes. However, in every community but Ouzinkie, a higher percentage of respondents answered positively in 1998 than had in 1992 (Fig. VII-55). The most significant change was in Chenega Bay, where in 1998, 66.7 percent of the respondents said young adults were learning subsistence skills. No one in Chenega Bay had said this was the case in 1992.

When asked why young adults are not learning subsistence skills, the most frequent response was that they have no interest in learning about subsistence activities (43.7 percent) (Fig. VII-57; Fall and Utermohle 1999: Appendix Table V-159). Also, 24.0 percent said that children were not learning enough because the role of subsistence in the community had declined, and 22.9 percent said that there was a lack of adults available to teach young people. Another common response was had to do with time: 10.4 percent said young adults have too many other interests competing with subsistence activities, and 9.1 percent asserted that young people just do not have the time to learn. Very few respondents cited restrictions on subsistence hunting and fishing or scarcity of subsistence resources as reasons for the failure of young adults to learn these skills. Case VII-10 provides some respondents' comments in 1998 on why, in their view, young adults were not learning subsistence skills adequately. Case VII-10 also

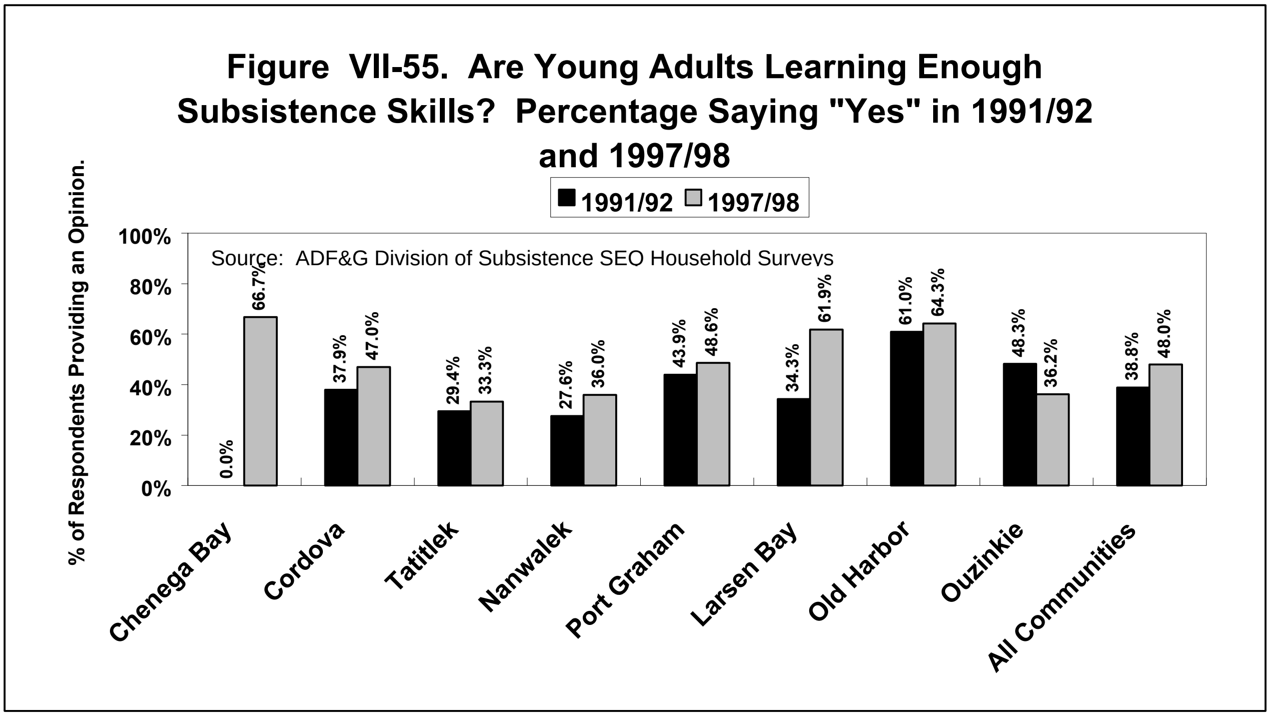


Figure VII-55. Are Young Adults Learning Enough Subsistence Skills? Percentage Saying "Yes" in 1991/92 and 1997/98
1991/92
1997/98
% of Respondents Providing an Opinion.
100%
80%
60%
40%
20%
0%
Source: ADF&G Division of Subsistence SEO Household Surveys
0.0%
66.7%
37.9%
47.0%
29.4%
33.3%
27.6%
36.0%
43.9%
48.6%
34.3%
61.9%
61.0%
64.3%
48.3%
36.2%
38.8%
48.0%
Chenega Bay
Cordova
Tatitlek
Nanwalek
Port Graham
Larsen Bay
Old Harbor
Ouzinkie
All Communities

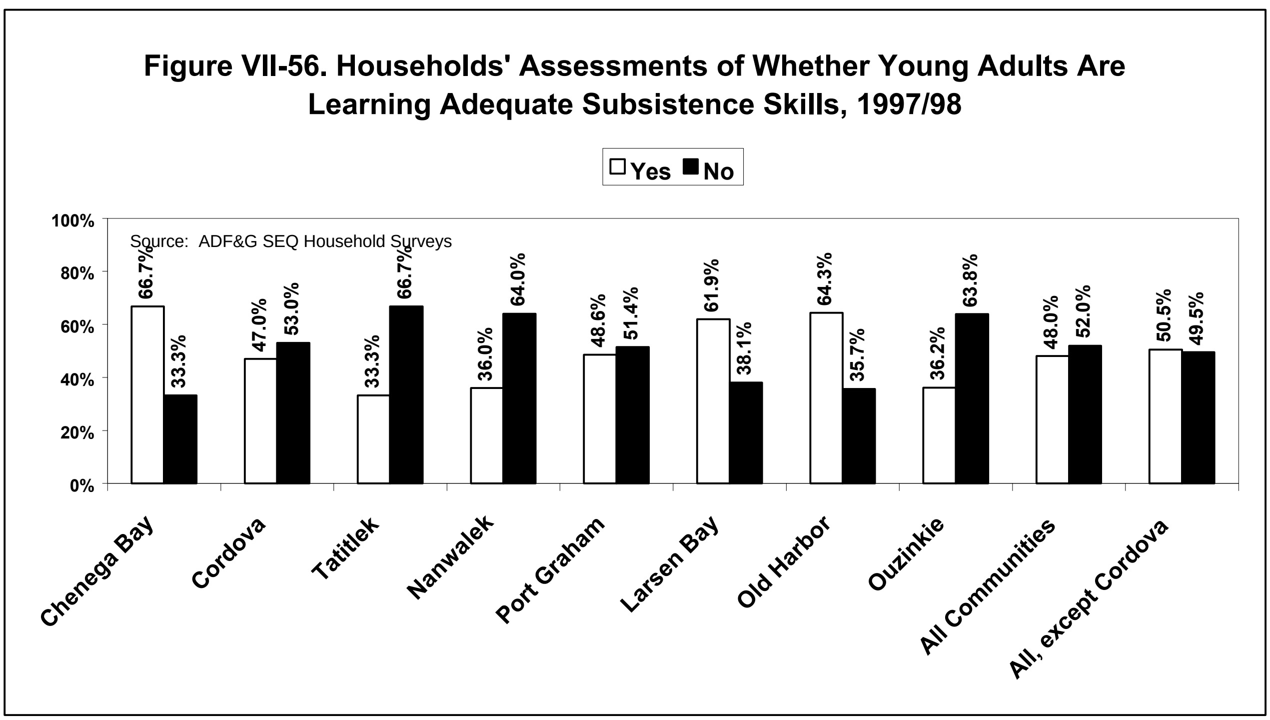


Figure VII-56. Households' Assessments of Whether Young Adults Are Learning Adequate Subsistence Skills, 1997/98
Yes
No
100%
80%
60%
40%
20%
0%
Source: ADF&G SEQ Household Surveys
66.7%
33.3%
47.0%
53.0%
33.3%
66.7%
36.0%
64.0%
48.6%
51.4%
61.9%
38.1%
64.3%
35.7%
36.2%
63.8%
48.0%
52.0%
50.5%
49.5%
Chenega Bay
Cordova
Tatitlek
Nanwalek
Port Graham
Larsen Bay
Old Harbor
Ouzinkie
All Communities
All, except Cordova

Figure VII-57. Reasons Why Young Adults Are Not Learning Enough Subsistence Skills, 1997/98

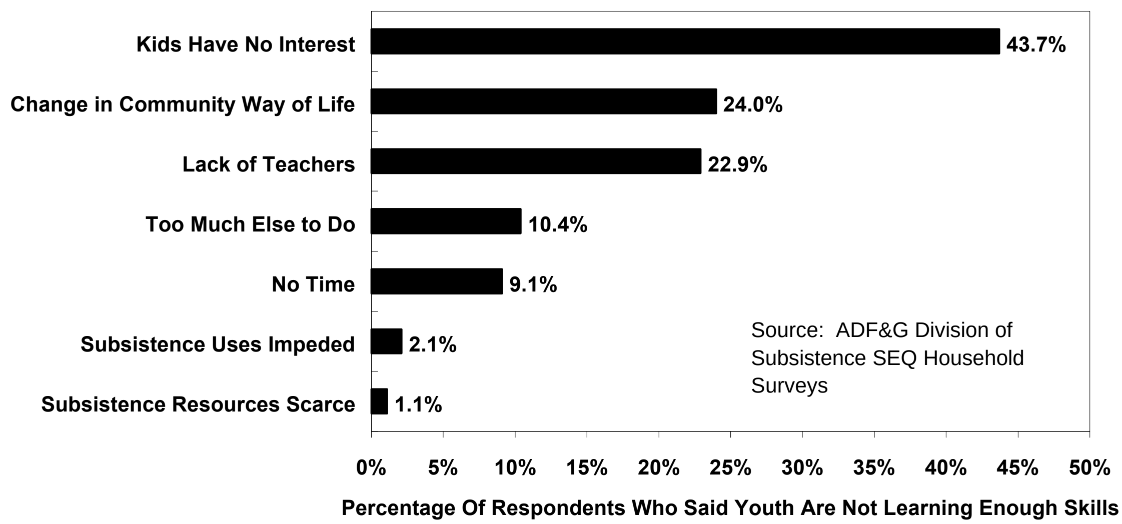
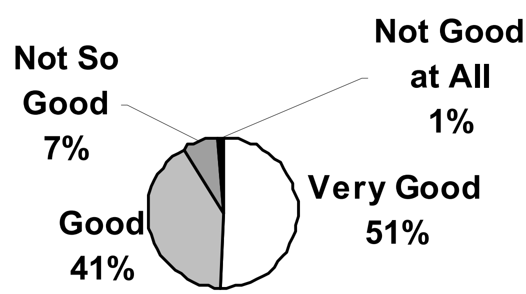


Figure VII-58. How Effective Are Spirit Camps in Teaching Subsistence Skills? Responses in 1998



provides examples of comments from those respondents who took the opposite view, that young adults were learning what they need to know about subsistence.

Case VII-10. Differing Opinions on How Well Young Adults are Learning about Subsistence, 1998

Reasons for Stating that Young Adults Are Not Learning Adequate Subsistence Skills:

Younger kids don't seem to care much. They just watch TV. [Chenega Bay]

I think the fast food generation is prevalent. Quick and easy is more convenient for them than the effort and time to cook something up. [Cordova]

Nobody is teaching them and there are so many things that take up their time, and they have other means of gathering food: processing food to them is opening a package and throwing it in the microwave. [Cordova]

Adults aren't teaching them, and fulfilling their cultural responsibility. Too many other attractions: TV, basketball, volleyball, work responsibility. [Port Graham]

It is important to learn, and if there isn't anything to hunt, how can you teach them the skills? [Port Graham]

They have lost interest because people are afraid to eat some of the food. [Larsen Bay]

Parents are more occupied with employment, more monetary way of life than subsistence now. Children used to have to participate with parents in hunting and gathering to survive. Ever since the passing of ANCSA [Alaska Native Claims Settlement Act], Natives have started giving up traditional ways of life due to more money flowing into the communities. [Ouzinkie]

Reasons for Stating That Young Adults are Learning Adequate Subsistence Skills:

Even young children want to learn. They want to cut and salt fish. These are skills being passed along by many parents. [Old Harbor]

Young people are responding to elders. [Old Harbor]

Quite a few young men know a lot. Young girls are willing to be taught if they don't know already, such skills as splitting fish. [Old Harbor]

They are learning more because of emphasis on subsistence after the oil spill. [Port Graham]

Adults need to keep teaching them. They shouldn't give up on them. [Tatitlek]

Spirit Camps

Two spirit camps took place in the summer of 1998 in the general vicinity of the spill area communities. The first, run by the Chugach Heritage Foundation, took place at *Nuciiq* (Nuchek) in Prince William Sound and served youth from the Chugach region. This camp operated in 1999 and 2000 as well. The second took place at Sitkalidak Island near Old Harbor (Kodiak Island) and served youth from the Kodiak Island Borough.

Among those respondents in 1998 who were informed about the spirit camp programs there was generally a very positive evaluation: the vast majority said spirit camp performance was either “very good” (50.3 percent) or “good” (40.9 percent) (Fig. VII-58). A large majority of households in every community rated spirit camp performance as either “very good” or “good.” Most respondents who rated spirit camps highly cited reasons such as “the children are learning important skills” and “there is good interaction between elders and youth.” Case VII-11 provides selected comments to illustrate the range of evaluations of spirit camps offered by the survey respondents in 1998.

Case VII-11. Some Comments on Spirit Camps, 1998

It’s an opportunity for kids, even though moms and dads are busy. They are put in groups and taught by elders. Very good. [Cordova]

It’s a concentrated effort to pass skills on in a good environment. [Cordova]

Because they have hands-on training from skilled people. [Cordova]

I hear they’re doing great out there. The kids look like they’re happy out there and learn a lot from the elders. [Cordova]

They teach by doing. [Old Harbor]

I talked to one of the children who went. He really learned something there. [Ouzinkie]

Kids are learning more because they want to at these camps. They show more interest at these camps than at home. [Ouzinkie]

Really excellent. An isolated area to teach them; kids have not much choice but to listen. No TV. No McDonalds. [Tatitlek]

Spirit camps are good as a first look, but they should progress to adults showing and teaching. It’s not the final say. [Port Graham]

The intent is good. However, if the skills aren’t practiced [then is not worthwhile]. [Port Graham]

ELDERS' INFLUENCE[2]

In the years after the EVOS, many residents of spill area communities reported that the traditional role of elders in teaching traditional skills and values had been disrupted by the event and its aftermath. Over the three years of systematic interviews with the SEQ (1991/92 through 1993/94), the pattern of responses for the entire sample did not change significantly. About 35 percent to 40 percent of all respondents said that elders' influence had either decreased or stayed the same; a smaller percentage each year, about 20 to 25 percent, said elders' influence had increased (Fig. VII-59).

However, there were differences in responses by community type. Figure VII-60 reports responses to the SEQ query in 1994, "Over the last five years, do you think the influence of elders in the community has decreased, stayed the same, or increased?" Respondents in the villages of the spill area (especially Prince William Sound and Lower Cook Inlet) were much more likely to say that elders' influence had declined, with mid-sized communities of the spill area also showing this tendency, but to a lesser degree. In contrast, respondents in the villages of the Arctic area and the larger communities of Kenai and Valdez were less likely to say that elders' influence had declined and more likely to say that it had increased

In 1998, about ten years after the spill, the largest percentage of respondents in all the eight study communities but Cordova and Tatitlek reported that elders were playing less of a role in the traditional way of life than they had ten years before (Fig. VII-61). For all eight communities combined, 41.2 percent of respondents said elders' influence had declined, but in the seven smaller communities (excluding Cordova), a majority of 51.4 percent reported a declining influence of elders. Interestingly, quite a few respondents in the Prince William Sound communities of Chenega Bay (36.4 percent) and Tatitlek (40.0 percent), and a plurality in Cordova (46.0 percent), stated that the influence of elders had increased compared to ten years before. It is worth noting that a spirit camp has taken place at Nuciiq for several years, and an elders/youth conference was held in Cordova in 1998. These programs may account at least in part for the perception in Prince William Sound communities that elders were playing more of a role in helping to pass on the traditional way of life in 1998 than over the previous ten years.

Correspondingly, fewer households in Chenega Bay, Cordova, and Tatitlek in 1997/98 said that elders' influences had declined compared to before the spill than had in 1993/94; such a change was not detectable in the other communities, with the possible exception of Old Harbor (Fig. VII-62). More households in Chenega Bay, Cordova, Tatitlek, and Old Harbor said that elders' influence had increased than in any previous study year, and this resulted in an overall increase in the combined eight study communities (Fig. VII-63).

Respondents offered various explanations regarding why elders' influence has declined over the last ten years (Fall and Utermohle 1999: Appendix Table V-158). Most often cited were "cultural" reasons, such as a perceived change in values or the role of subsistence activities (25.8 percent of all

[2] This section is based primarily on Fall and Utermohle 1999:88-93

Figure VII-59. How Has Elders' Influence Changed Since 1989? All Communities Combined, Study Years 1991, 1992, & 1993

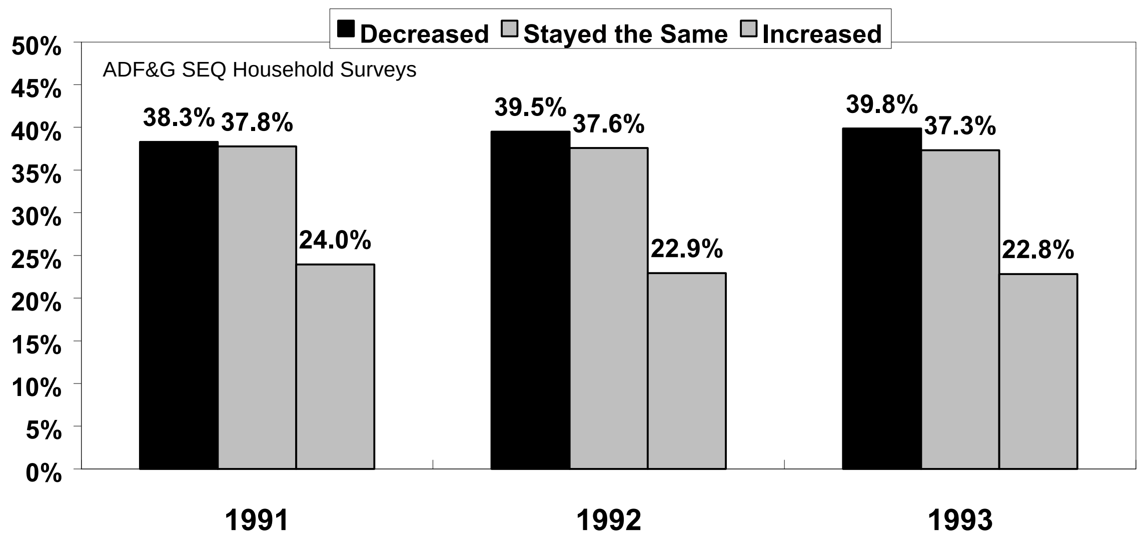


Figure VII-60. Has Elders' Influence Changed since 1989? Responses for Study Year 1993 by Community Category

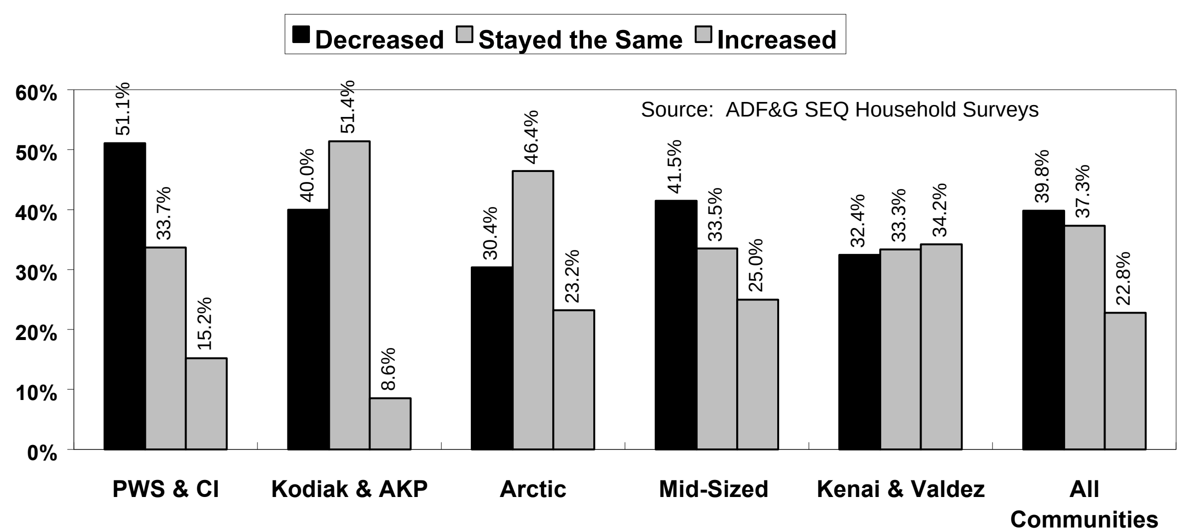


Figure VII-61. Assessment of Influence of Elders in Teaching Subsistence Skills and Values Compared to before the *Exxon Valdez* Oil Spill, 1998

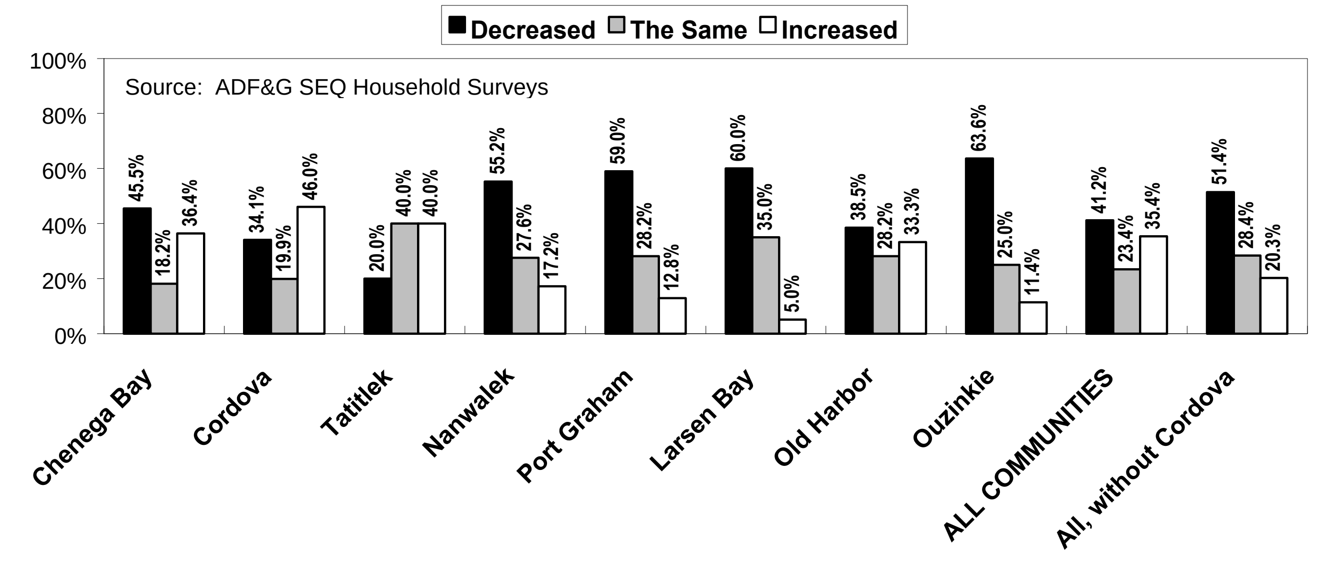


Figure VII-62. Changes in Elders' Influence in Teaching Skills and Values since the EVOS: Percent Saying Influence has Decreased

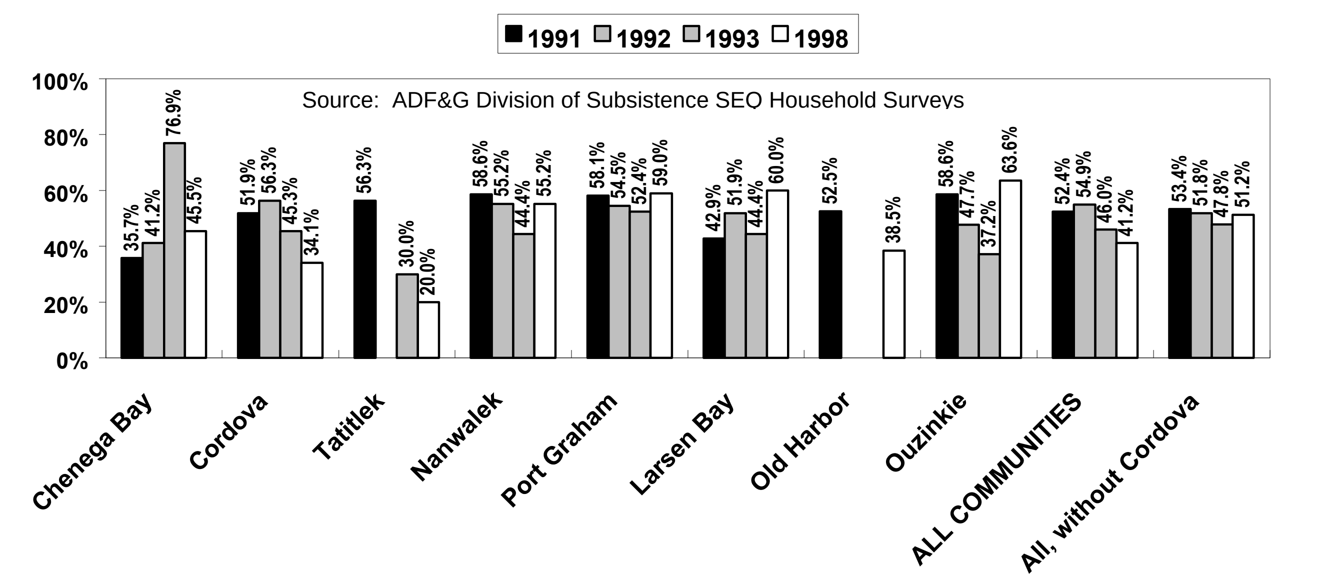


Figure VII-63. Change in Elders' Influence in Teaching Skills and Values Since the EVOS: Percent Saying Influence has Increased

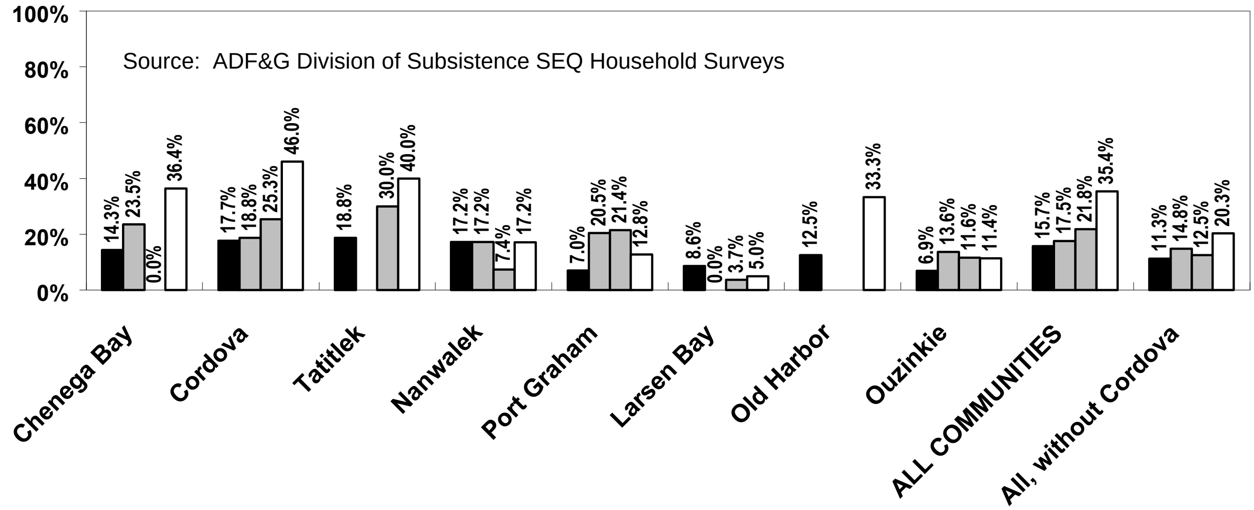
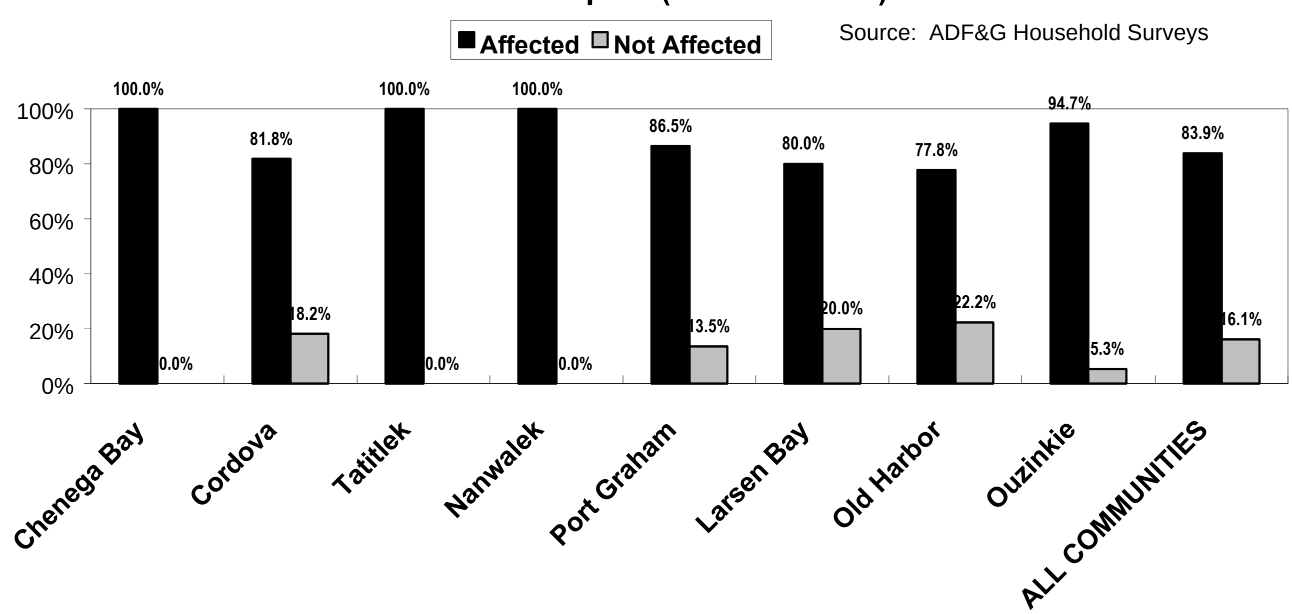


Figure VII-64. Was the Traditional Way of Life Affected by the *Exxon Valdez* Oil Spill? (asked in 1998)



respondents who said that elders' roles had diminished), and "social/political reasons," such as decreased interactions between youth and elders (25.8 percent). Others offered a more general observation that elders were just less active in teaching subsistence skills (19.7 percent), some said elders' influence declined because of the death of key individuals (16.4 percent), and some cited economic reasons, such as people being too busy with jobs to pass on skills (11.2 percent). Case VII-12 provides examples of the range of comments regarding a decline in the role of elders in subsistence.

For those respondents who reported that elders' influence in teaching subsistence skills and values has increased over the last ten years, explanations were evenly split between those associated with an enhanced role for or appreciation of the cultural importance of subsistence (56.6 percent) and increased interactions between elders and youth (56.6 percent) (Fall and Utermohle 1999: Appendix Table V-156). Also, 45.6 percent noted increasing activity of elders in subsistence and teaching. Case VII-12 provides some examples of respondents' explanations of this increased role.

STATUS OF TRADITIONAL WAY OF LIFE[3]

Based on the interviews conducted in 1998, the large majority of households in eight spill area communities (83.9 percent) believed that the traditional way of life had been injured by the *Exxon Valdez* oil spill (Fig. VII-64; Fall and Utermohle 1999: Appendix Table V-162). This included 78 percent or more of the households in all eight communities, and 100 percent in Chenega Bay, Tatitlek, and Nanwalek.

Of those households stating that the oil spill affected the traditional way of life, 66.7 percent in 1998 believed that recovery of the traditional way of life 10 years after the spill was incomplete, while 17.4 percent believed recovery was complete, and 13.7 percent were not sure (Fig. VII-65). In every community, by far the most households said that the traditional way of life had not yet recovered.

In 1998, respondents in the eight study communities were asked, "What should be done to help the traditional way of life recover?" Representative suggestions appear as Case VII-13. The most respondents (15.7 percent) pointed to supporting traditional skills and values through such efforts as spirit camps, elders/youth conferences, and other education efforts (Fig. VII-66; Fall and Utermohle 1999: Appendix Table V-163). Another common response was to continue or initiate efforts to restore injured populations (12.3 percent). But 12.3 percent were pessimistic, saying that nothing can be done, and 7.7 percent more just said that what is needed is more time to recover and to heal.

[3] This section is based primarily on Fall and Utermohle 1999:93-95

Case VII-12. Reasons Why Elders' Influence Has Changed, 1998

Why has the Influence of Elders Decreased?

Some Representative Responses, 1998

The culture is changing to a monetary system and more competition. Young people want money now. [Cordova]

The demands of lifestyles have changed. The kids don't hang around with elders like they used to, [because of] TV and sports. [Cordova]

There's less elders. A lot have passed on. [Cordova]

There's a change in community attitudes; increased depression, anxiety, and alcohol abuse. It's not cool any more. There's a generation gap and adults are doing it [subsistence] less. People have more money from corporation dividends and this is adversely affecting [the role of elders]. [Ouzinkie]

They are not teaching anymore. Everything is just history now. [Nanwalek]

Kids "know" more in a different way, "know-it-all kids." Kids have more lack of respect for elders, less respect for elders. The spill played a role because of the money, [which] caused less caring. Kids are learning from other sources. It used to be the elders' role to teach. [Nanwalek]

Younger ones do not seem to respect elders. It used to be "the law" if elders said something. [Old Harbor]

Because the wild foods aren't here the way the foods used to be, so elders can't show younger people how to do things with subsistence. [Port Graham]

Why Has the Influence of Elders Increased?

Some Representative Responses, 1998

There's different activities provided now during cultural week, native dance, drum making; more involvement in functions and more awareness and pride in culture. There's a class at the high school. I'm not sure where and who to attribute the increase, though, if it was due to the oil spill, more cultural awareness, or what. [Cordova]

Because of the growth of the Native village of Eyak tribal government, there's more awareness. [Cordova]

From my perspective, I think people are more aware of our unique history and knowledge and there is more effort to translate that to our children. As a young mother, I strive to pass that on to my children. I have always relied on and searched out their help of my elders, but I think I do that more than then ever before. [Cordova]

Because people are getting scared of losing their traditional ways or values that elders were taught. [Nanwalek]

Alutiiq consciousness is on the rise. People feel the need to pass on knowledge to the younger people. [Old Harbor]

It's harder to get subsistence foods now, so the younger generation is looking to the elders for help. [Ouzinkie]

They are finally realizing they are Aleuts. Kids are starting to communicate about their past. They reach out to elders for information and help. [Port Graham]

The subsistence skills are being lost, so elders are putting in more of an effort. [Tatitlek]

Figure VII-65. Has the Traditional Way of Life Recovered since the *Exxon Valdez* Oil Spill? (asked in 1998)

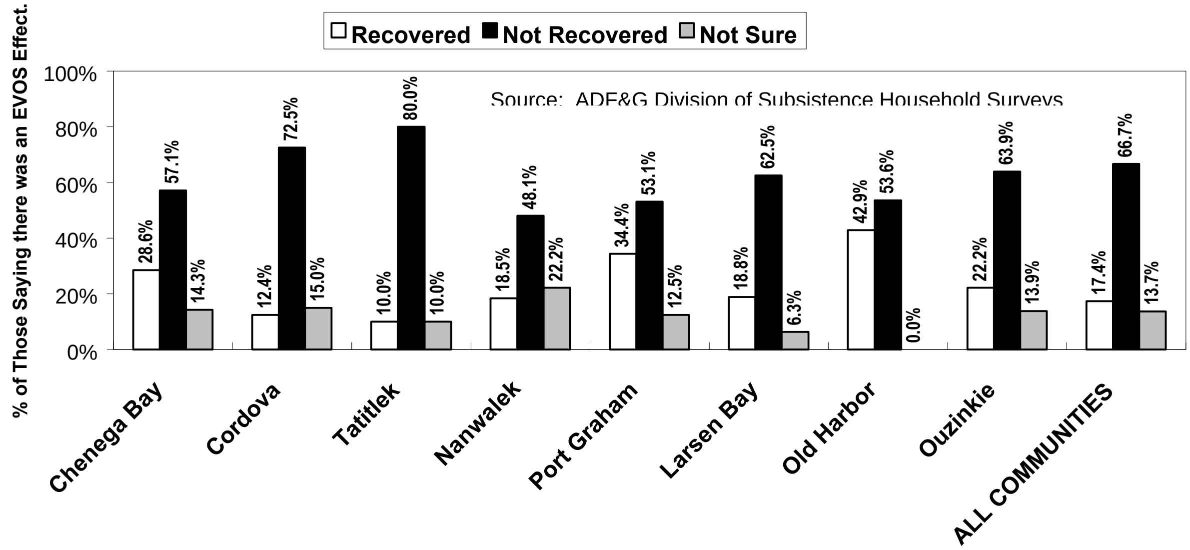
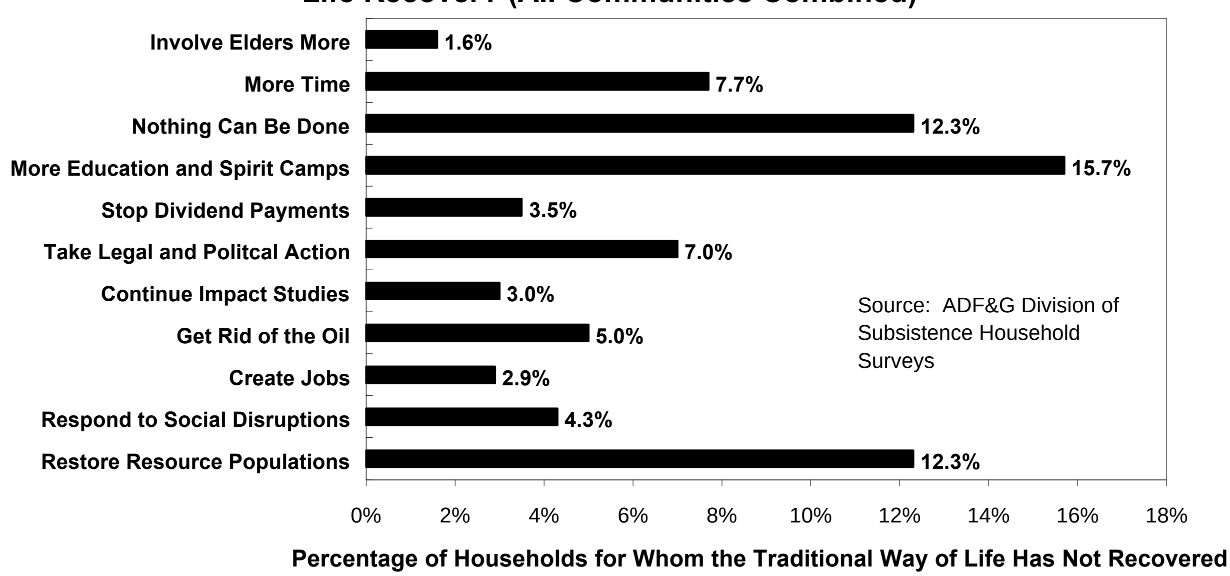


Figure VII-66. What Should Be Done to Help the Traditional Way of Life Recover? (All Communities Combined)



Case VII-13. What Can Be Done to Help the Traditional Way of Life Recover? Responses in 1998

A lot of it is economics. Because of the oil spill and the effects of that on the food chain, people had to work to keep their families going, therefore leaving the subsistence or traditional way of life and not passing it on to their children. This could take several generations to recover, provided we haven't already lost our traditional and cultural way of life. [Cordova]

The resources must recover before the traditional way of life can be brought back. [Nanwalek]

The tribal people must be included in the ecological equation. They've tried to help the plants and animals but not the people. [Cordova]

It's never going to recover. It can't happen. Everybody's got a pocketful of money now. You can't go back. [Chenega Bay]

Awareness has gone up. People are now trying to learn about the traditional way of life. [Cordova]

The spill helped focus on how easily the traditional way of life can be lost. This is a positive result of the spill, to make people aware. [Port Graham]

Our lives will never be the same. Partly, simply because times have changed. We have to identify the most highly valued parts of our traditions to save in a changing world. [Cordova]

If they could erase everything that happened during the spill. [Nanwalek]

More time may help. I think eventually everything will go back to normal. [Larsen Bay]

Unsure. Spirit camp will probably help with the revival of traditions. People try to keep up the customs, but it takes more than just a handful of people. More involvement is required by a wider group of people. [Old Harbor]

The kids of today have to go out with their parents more. [Ouzinkie]

More spirit camps that teach children the basics -- hunting, edible plants, building shelters, and processing foods. [Ouzinkie]

For all animals to be non-toxic so you can start eating them again and for the animals that died or migrated to be replaced so we can hunt them like we did before. [Ouzinkie]

Time will heal subsistence. [Ouzinkie]

Nothing can help. What's lost is lost. [Ouzinkie]

Give the resources time to recover from the spill and look at preventing future pollution to save natural resources. [Port Graham]

Parents need to take the time to teach skills and language to them. Parents need to teach them more instead of leaving it to someone else. [Port Graham]

Source: Fall and Utermohle 1999:93-95

Chapter Eight: Economic and Sociocultural Effects of the *Exxon Valdez* Oil Spill on Resident Human Groups - II

INTRODUCTION

The previous chapter described the general pattern of responses to the oil spill by households in Alutiiq villages. The responses were characterized as "averages" among all community households across a number of measures (wild food harvests, sharing of wild foods, employment, and so forth). While averages are useful for depicting central tendencies within human groups, they can mask the ways that segments of a community responded to the spill crisis. One may expect that not all households were affected equally by the spill, because we know that households are not situated equally in a community. How did particular types of households respond to the spill? Were some households affected differently than others? How did the production and distribution of wild foods within kinship networks play out? Was there a cascade effect from high producing households down through the community to more dependent households? Or were dependent households insulated from spill effects by traditional social support mechanisms within a village?

This chapter explores these types of questions by analyzing effects among types of households. The analysis attempts to shed light on how the domestic mode of organization in the subsistence sector performed to deal with the problems created by an oil spill. The findings will suggest that the oil spill caused no breakdown in the social organization of subsistence production and distribution in Alutiiq villages. Nor did the spill and its aftermath appear to produce any lasting structural changes in the domestic mode organization. On the contrary, the information reported by surveyed households suggests that the customary and traditional organization of the kinship-based subsistence sector adapted to the crisis as it unfolded. Reductions in wild food harvests represented not a failure of the subsistence economy, but short-term contractions of activity in the subsistence sector by productive households for health reasons identified in Chapter Seven. The limited supply of wild foods produced during the first spill year was disproportionately channeled to the most dependent households in the village – the elderly, young single mothers, and the infirm. During the crisis, the structural configuration of the domestic mode was maintained. In the post-spill recovery, using pre-spill domestic mode structures, households once again expanded activities in the subsistence sector. This was possible because wild food resources had not been permanently degraded by contaminants.

Finally, this chapter discusses an economic and cultural revitalization within Alutiiq villages in response to the spill. As stated in Chapter Six, Alutiiq leaders lobbied hard to obtain a share of damage award settlements for public losses. After an initial struggle, the Alutiiq were successful in redirecting some of the settlement money into projects that might directly benefit villages. This chapter will discuss how the money was invested in projects designed to counter potential long-lasting economic, social, and cultural damages to the villages. The "investment" of damage settlements into community-based programs was directed toward revitalizing the local economy and traditional cultures of Alutiiq villages nearest the oil spill.

PRODUCTIVITY BY HOUSEHOLD TYPE

The assessment of impacts on types of households was guided by two underlying questions. First, was household economic productivity related to a general household developmental cycle in Alutiiq villages? Second, were the economic responses of households to the *Exxon Valdez* oil spill different depending upon the place of the household in the developmental cycle? These questions derive from the theoretical understanding that the domestic mode of production characterizes the subsistence sector in mixed economies. That is, the organization of production and distribution of wild foods is primarily within domestic family groups organized through the kinship system. We expect that mature households in the household developmental cycle will be the high producers and distributors of wild foods. We expect that certain types of households will be low producers and high receivers of wild foods -- that is, younger (less well established) households and households with fewer factors of production (labor force, skills, social obligations), such as retired elders, single mothers with young dependent children, and persons with disabling conditions.

In an event like the *Exxon Valdez* oil spill, we would predict that the greatest direct impacts on wild food production and distribution within a village will be through responses of the higher producing households. Economic effects within lower producing households would be secondarily manifested through decreased distributions of wild foods from high producers, rather than decreased food production by these households directly.

To examine these relationships, we analyzed the spill responses of Alaska Native households in the four Alutiiq villages closest to the spill -- Tatitlek, Chenega Bay, Port Graham, and Nanwalek. Alaska Native households were placed into five developmental household categories, shown in Figure VIII-1. Into the “least” developed household type we grouped three kinds of households -- single mothers with young dependent children (less than 16 yrs of age), retired elders (60 yrs or more and producing less than 50 pounds of wild food per capita), and inactive single-person households (producing less than 50 pounds of wild food per capita). These households are thought to lack certain factors of production, such as labor, skills, good health, or social responsibilities for producing wild foods. Therefore, as households with incomplete factors of production, they are at the low end of the developmental scale. In addition to this, three household categories were defined by age of the oldest household head – “developing” households (20 yrs - 39 yrs), “mature” households (40 yrs - 59 yrs), and “active elder” households (60 yrs or more and producing more than 50 pounds of wild food per capita). Other things being equal, as a household group matures in age (as measured by the age of the household head), one might expect that the labor pool, level of skills, and number of social obligations of the household in the community also increase. Finally, a fifth household category was created – “active single-person” households -- usually

Figure VIII-1. Frequency of Native Household Types, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

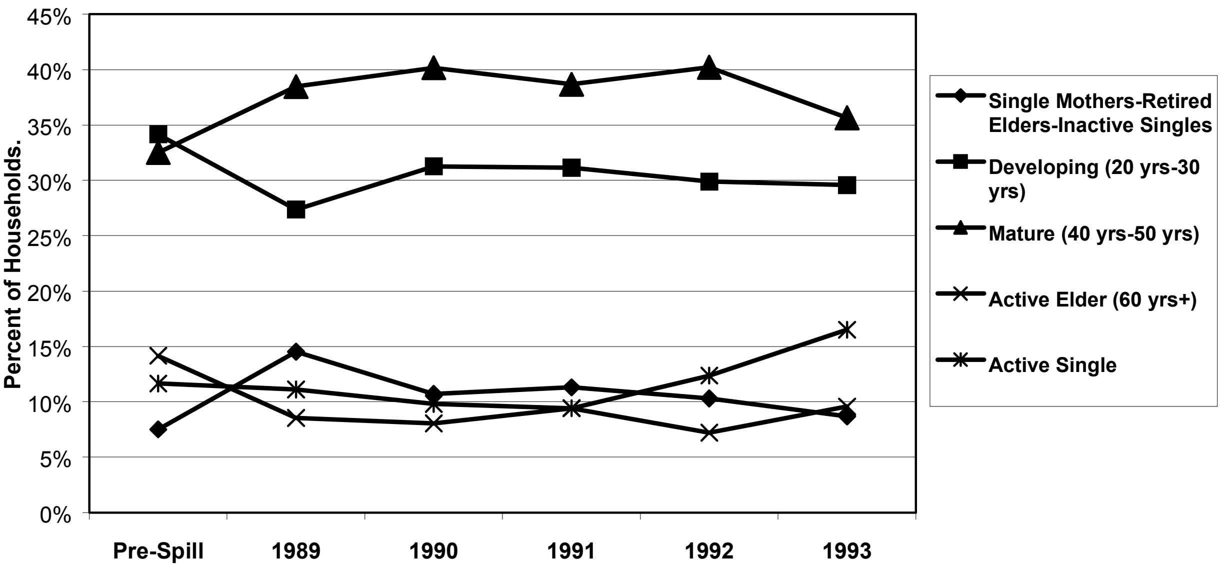
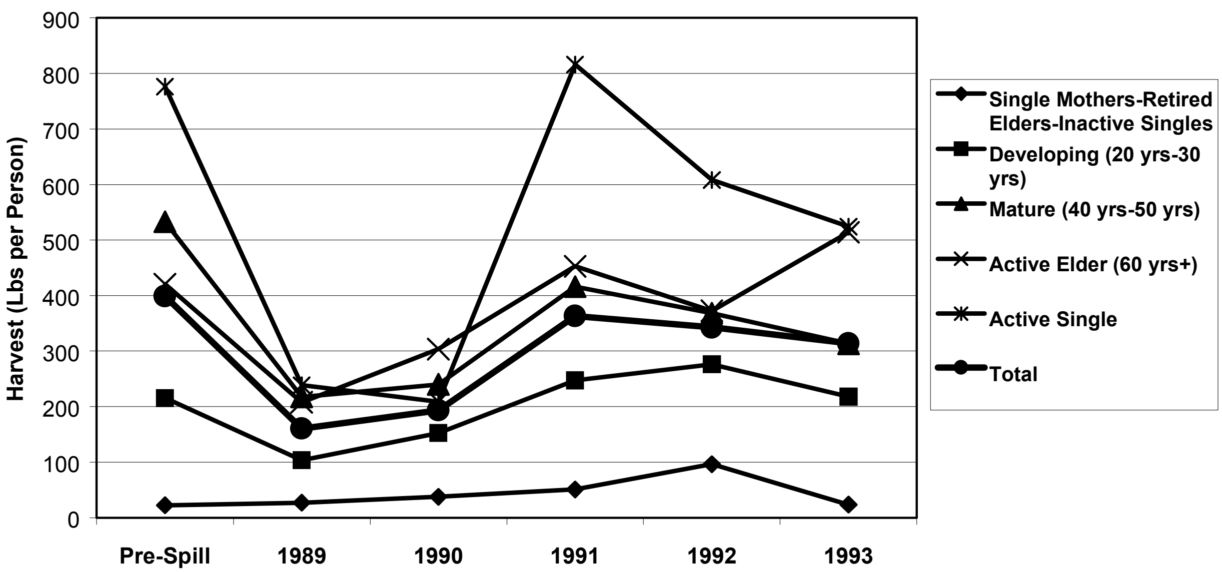


Figure VIII-2. Wild Food Harvests by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993



men living alone (presumably bachelors, widowers, divorced men, or husbands separated from spouses) producing more than 50 pounds per capita. This household type falls outside the "normal" household developmental cycle, and may maintain kinship links and social obligations with members of other households in the community, such as parents, siblings, and children.

The frequencies of each household type in the four villages by year are shown in Figure VIII-1. There were relatively stable frequencies of the household types within the four communities during the oil spill period. As shown in Figure VIII-1, the category of single mothers-retired elders-inactive singles constituted about 7 percent – 14 percent of households in a village during any survey year. Developing households (20 yrs - 30 yrs) comprised about 30 percent of households, mature households (40 yrs - 59 yrs) comprised about 35 percent – 40 percent of households, and active elder households (60 yrs or more) comprised about 7 percent – 10 percent of households. Active single-person households comprised about 10 percent – 15 percent of households. (In this analysis, the pre-spill years were as follows -- Chenega Bay, 1985; Tatitlek, 1988; Port Graham, 1987; and Nanwalek, 1987. The survey years 1989 through 1993 include all four communities, except for 1992, which includes only three communities -- Tatitlek was not surveyed that year.)

The first theoretical assertion seems to be supported by Figure VIII-2 -- on average, production of wild foods appears to be associated with household developmental type. In all years the single mothers-retired elders-inactive singles stand apart at the bottom in terms of subsistence productivity -- on average, this household type does not produce wild foods for itself in large quantities (less than 100 pounds per person most years). In all years, developing households (20-30 yrs) ranked next in terms of subsistence productivity. Excluding two spill impact years (1989 and 1990), developing households were producing on average between 200-299 pounds per person. The next two household categories were very close in productivity and relative ranking -- mature households (40-59 yrs) and active elder households (60+ yrs), producing on non-spill years between 300-450 pounds per person. The active single-person household type stands apart as the most productive at the per capita level most years. It should be noted that these are mean harvests by households in a group. Within each group there was substantial variation in wild food production levels. As shown in a correlation analysis discussed below (see Figure VIII-11), household maturity at most accounted for about 28 percent of the variability in size of a household’s subsistence harvest. Much of the additional unexplained variability is related to other factors, such as the place of households within particular multi-household extended kinship groups in the village, which were not measured by the household surveys. While there is this variation, the mean productivity of wild foods by households appears clearly related to a normative development of kinship-based household groups as they mature over time.

Overall, household responses to the 1989 oil spill are clearly evident in the graph. Mean household productivity of wild foods was depressed in 1989 and 1990, the first and second years following the oil spill. Wild food outputs by Alutiiq households in this sample were 60 percent lower in 1989 and 52 percent lower in 1990 compared with the pre-spill level. Wild food harvests rebounded in

1991 (only 9 percent lower than pre-spill levels). From 1991-93, outputs have ranged between 300-399 pounds per person.

Were the subsistence harvests of certain types of households differentially affected by the spill? As shown in Figure VIII-2, the direct impacts of the oil spill on household subsistence productivity appear to have been relatively equivalent for all household types, with the exception of the lowest-producing household group. Four of the five household types show reductions in wild food productivity the first post-spill year (1989) -- developing households (-52 percent), mature households (-59 percent), active elder households (-51 percent), and active single-person households (-69 percent). The exception to this pattern was the lowest-producing type, which displays little change in wild food productivity. Their harvests were low before the spill and continued to be low after the spill. The oil spill had little direct impact on subsistence production by the most dependent households in the community.

The relative change in harvests was quite consistent across productive household types, indicating that households throughout the maturational cycle responded to the oil spill by reducing wild food production. At the same time, the absolute change in harvest volumes was greatest for the mature households (40-59 yrs) and active elder households (falling about 200 pounds per capita) compared with harvests by developing households (20-39 yrs), which fell about 100 pounds per capita. The oil spill had the greatest direct impacts on the total volume of wild foods produced and distributed within a village through the wild food reductions of the older, more mature households in the community. The wild food harvests of active single persons showed the greatest changes in absolute magnitudes.

There were slight differences among household types in restoration of wild food harvests after the first post-spill year. The developing households (-29 percent) and active elder households (-28 percent) show some signs of rebounding food production in the second post-spill year, and are at or above pre-spill levels by the third post-spill year (+15 percent and +8 percent, respectively). By comparison, the mature households have remained at a lower level of productivity compared with pre-spill levels (-59 percent, -55 percent, -22 percent, -31 percent, -41 percent). There is no ready explanation as to why this might be the case. The harvests of the active single-person households rebounded by the third post-spill year. The harvests of this group show the most variability between years. The wild food harvests of single mothers-retired elders-inactive singles remained low.

SHARING BY HOUSEHOLD TYPE

One would expect that changes in wild food harvests by household types would be associated with comparable changes in the sharing of wild foods. To examine this question, trends in sharing by household types in the four Alutiiq villages nearest the spill were analyzed, shown in Figures VIII-3 and VIII-4. Figure VIII-3 depicts the percentage of all types of species harvested that were received by a household during a year’s period. It shows that all household types (with the exception of active single-person households) received about 20 percent – 25 percent of the species harvested in the community

Figure VIII-3. Wild Foods Received by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

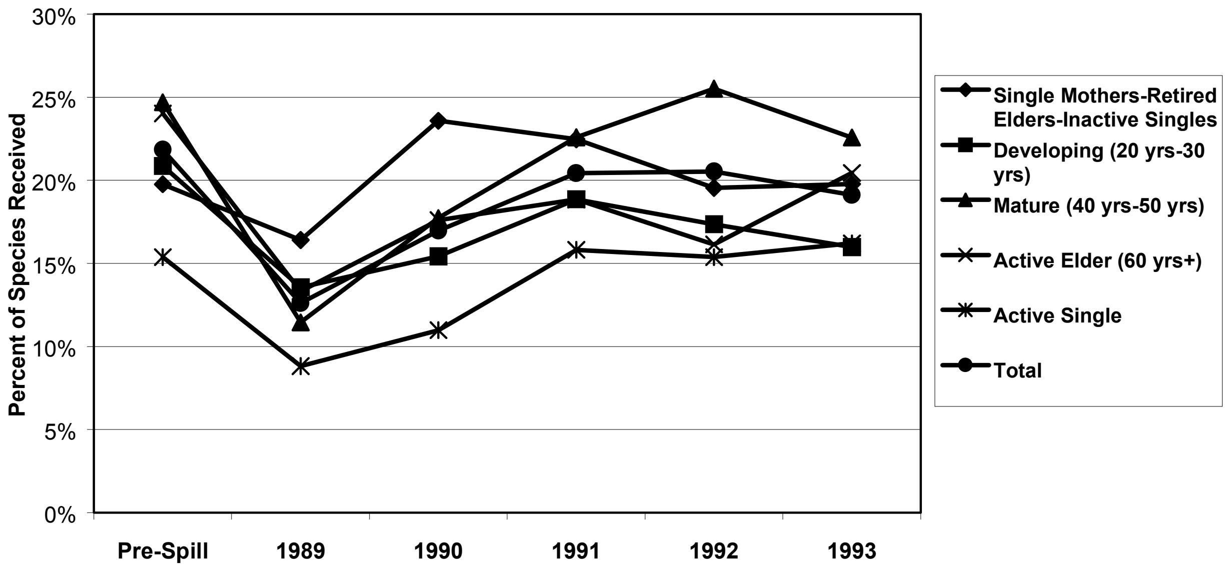
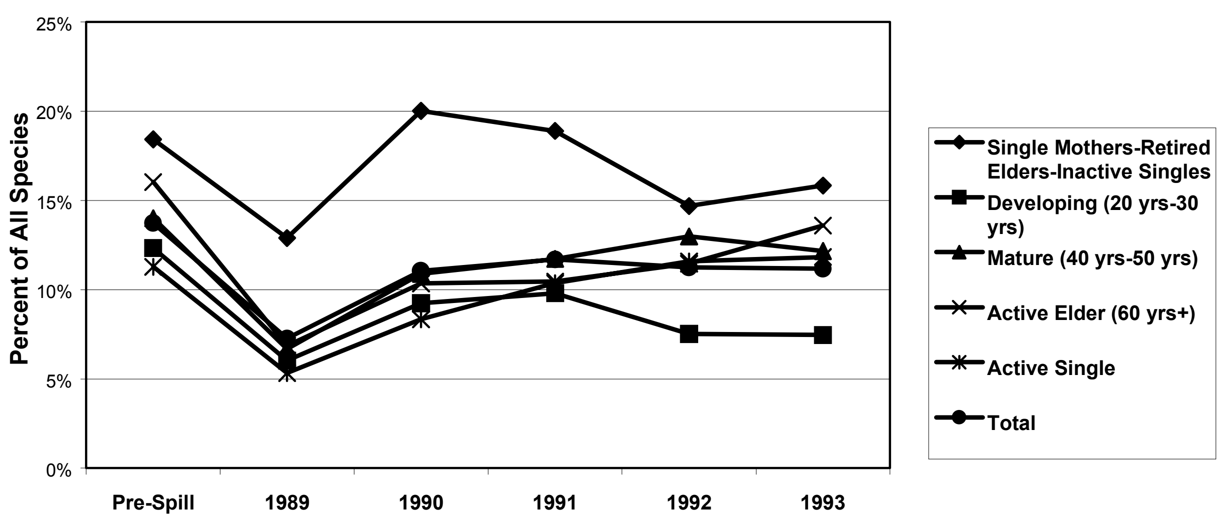


Figure VIII-4. Wild Food Species Received (but Not Harvested) by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993



during the pre-spill year. Active single-person households received less, about 15 percent of all species. This number measures the variety of wild foods received during a year. The quantity (pounds) of wild foods shared was not asked on household surveys.

As discussed in the previous chapter, sharing of wild resources between households declined during the first post-spill year. Overall, the percentage of species received by households through sharing declined by 42 percent the year of the spill in this sample of households (Fig. VIII-3). However, the reduction in sharing was not experienced equally among all household types. The impacts of reduced sharing appear to have been least on low-producing households, who are most dependent on sharing from other households for their use of wild foods. This is shown in Fig. VIII-3 for the year 1989. The percentage of species received by the household group of single mothers-retired elders-inactive singles declined by only 17 percent the year of the spill, compared with the 42 percent decline for all households. This is also illustrated in Figure VIII-4, which depicts the percent of wild food species received by a household that also were not harvested by a household. Single mothers-retired elders-inactive singles stand above all other household types by this measure, indicating that sharing is a more important route for obtaining wild foods by this household type compared with other households.

While food production levels and species diversity declined the year of the spill, this analysis of sharing patterns suggests that sharing of wild foods continued to be directed toward the neediest households in the community. Deficits of shared food were disproportionately absorbed by the other, less-needy household types. These patterns show how the traditional family support system functioned in the village during the spill crisis. Though food production was low overall, productive households continued to take care of the community's most dependent households (retired elders, single mothers with young dependent children, and inactive singles) by differentially distributing to them the wild food stocks that could be shared. This differential support is also shown in 1990, the second post-spill year -- sharing levels had rebounded to pre-spill levels (and above) for this most-dependent group of households, but had not yet rebounded to pre-spill level for any other household type.

Households reported that sharing was less during the oil spill – households shared less because there were fewer wild foods to share (see Chapter Seven). This was true for the village as a whole. However, at a more detailed level, we see that traditional systems of distributing wild foods did not breakdown, but were adjusted following traditional rules that prioritize types of distribution. Sharing with the elderly and with those who cannot harvest for themselves are high-order social values in Alutiiq culture. Based on the evidence, households were guided by these customary rules in the distribution of limited supplies of wild foods. Households did not hoard or become stingy vis a vis the elderly, single mothers with young children, and dependent singles. The kinship network did not fracture and fragment into smaller, self-interested units when wild foods became scarce. The most vulnerable segment of the extended kindred and of the tribal group continued to receive foods during the oil spill crisis. Sharing was reduced to other household types, presumably because they had greater economic options, such as working in spill activities and purchasing commercial foods. This sharing pattern during an economic downturn reflects the activation of a traditional social support system within the village. There was no social breakdown of traditional social support systems during the emergency.

Figures VIII-5 to VIII-7 provide additional details on the wild food distribution system within the four Alutiiq villages nearest the spill. They show that patterns of distribution of wild foods are related to the household development cycle, as is productivity. The diversity of species harvested (Fig. VIII-5) and given away (Fig. VIII-7) increases with a household's development level. The diversity of species used also increases with the household's developmental stage (Fig. VIII-6). Though needy households receive a greater diversity of species than other household types, other more-productive household types utilize a greater diversity of species. This shows that not all types of species are shared, or reported as shared, among households. It appears that a core set of species is shared. About 20 percent of all potentially harvestable species get shared according to what the low-producing households report. Other species are utilized by the households that produce them, and these other species are not reported as shared by surveyed households.

MONETARY INCOME BY HOUSEHOLD TYPE

Household members near the spill commonly worked in cleanup programs (see Chapter Seven). Such workers earned monetary income used in part to purchase store foods as replacements for forgone subsistence harvests during the spill year. We would anticipate that households that were high producers in the subsistence sector might also be high earners in the wage sector, because the factors of production are similar in each sector -- mature workforce, skills, and social obligations. One prediction would be that income earned during the oil cleanup phase would be statistically related to a household's place in the developmental cycle.

How household earnings in the wage sector changed in response to the spill, by household type, is shown in Figs. VIII-8 to VIII-10. Fig. VIII-8 shows total household income, including earned income from wages, dividends, and retirement and unearned income from entitlements. It is difficult to say that predicted relationships between income and household development type are supported by Figure VIII-8. The relationships between household income and household developmental stage look to be more complex than the relationships between wild food production and household type. Incomes of active single person households on average are consistently very low, related primarily to a household labor pool of one adult. Thus, the household type with the highest per capita harvests (Fig. VIII-2) displays the lowest monetary incomes (Fig. VIII-8). The single mother-retired elder-inactive singles household type displays lower incomes than all other household types on all years. This relationship is expected. Households with incomplete labor pools are likely to display low productivity in both subsistence and commercial-wage sectors.

The relative rankings of the other three household types by income are not consistent across years. Developing households on average earn as much or more monetary income as

Figure VIII-5. Diversity of Wild Foods Harvested by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

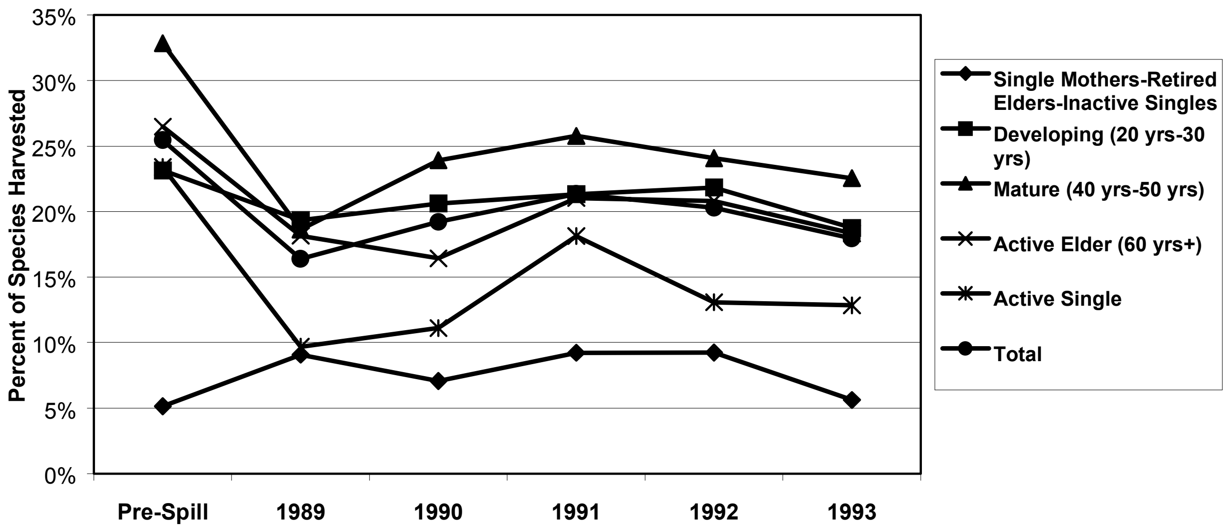


Figure VIII-6. Wild Foods Used by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

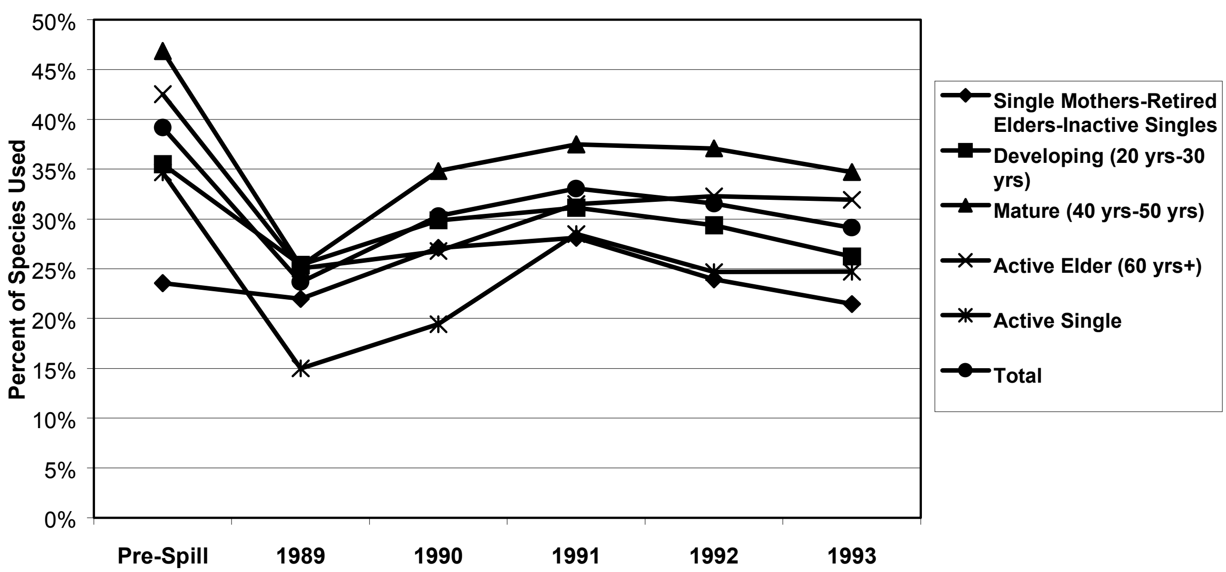


Figure VIII-7. Wild Foods Given by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

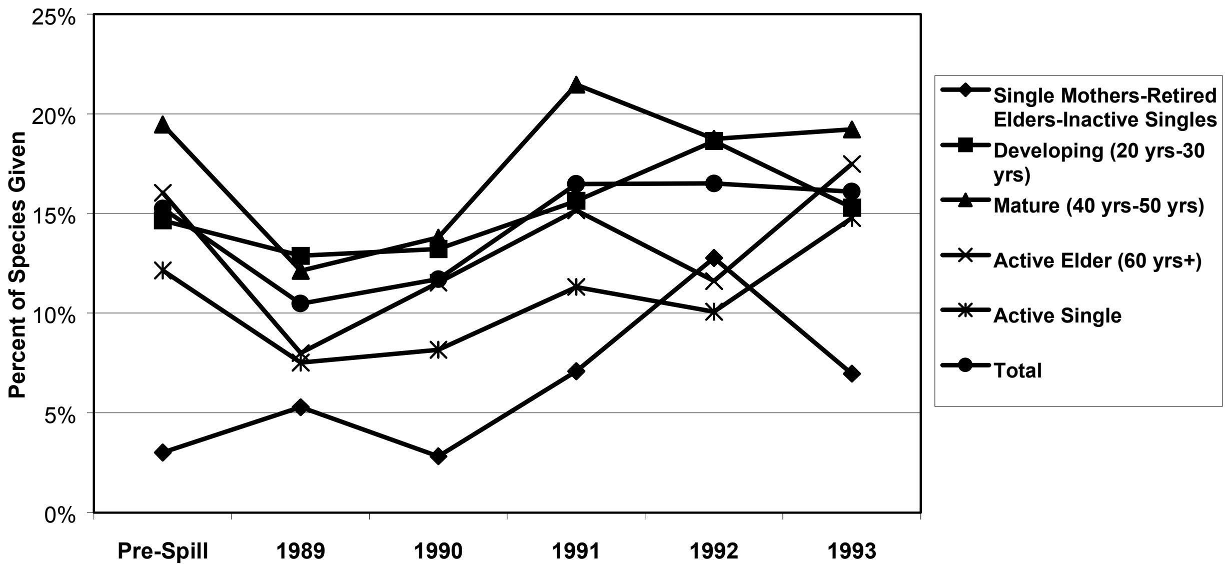


Figure VIII-8. Household Income by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

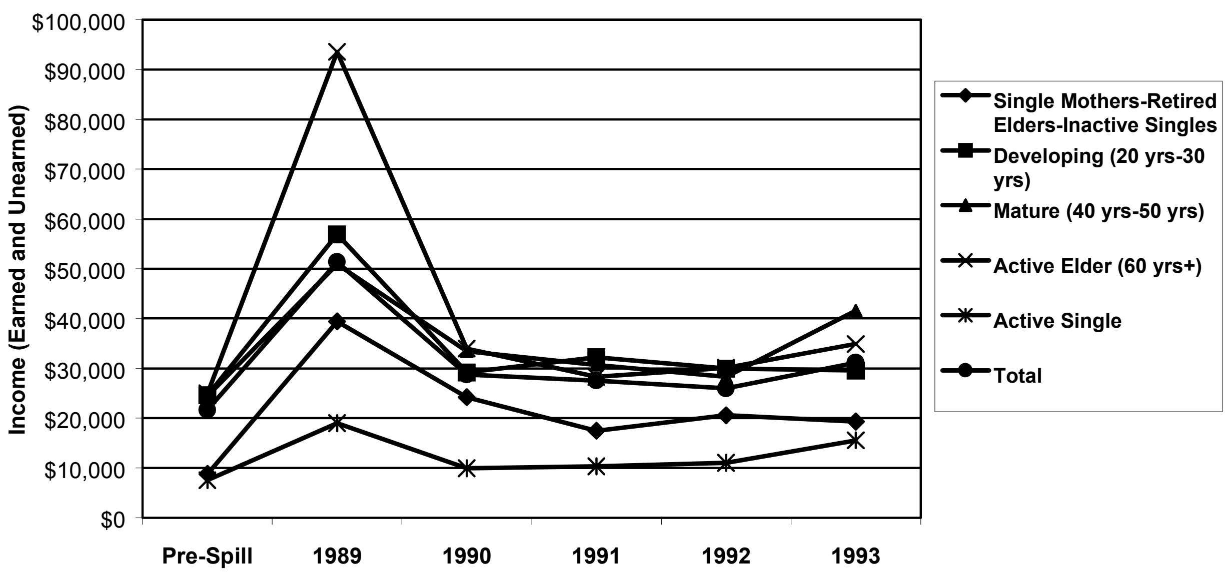


Figure VIII-9. Wage Incomes by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993

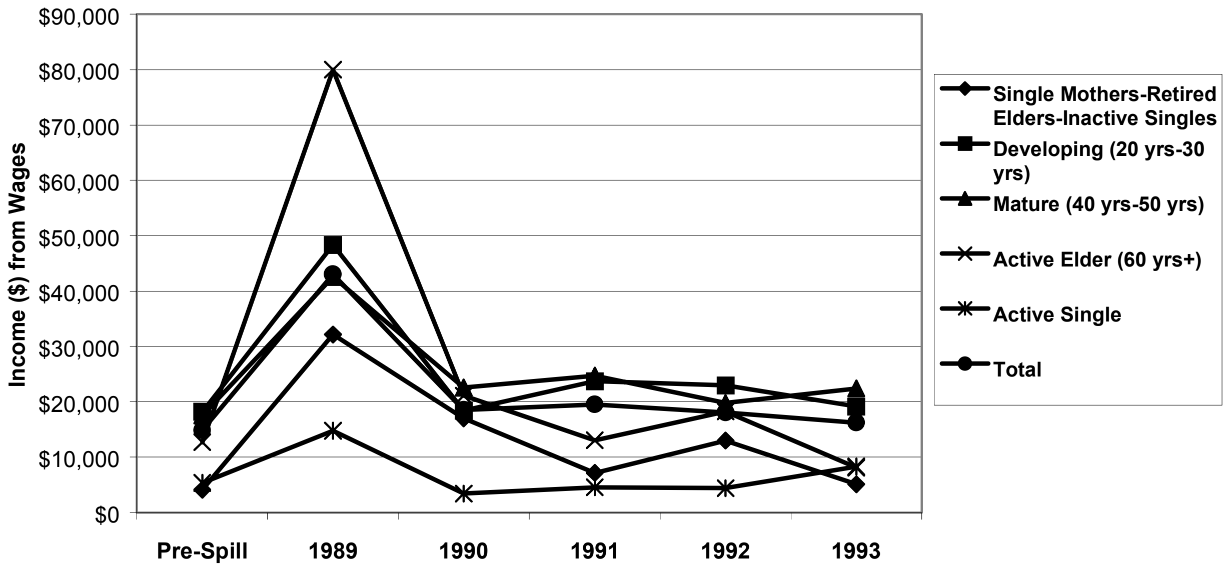
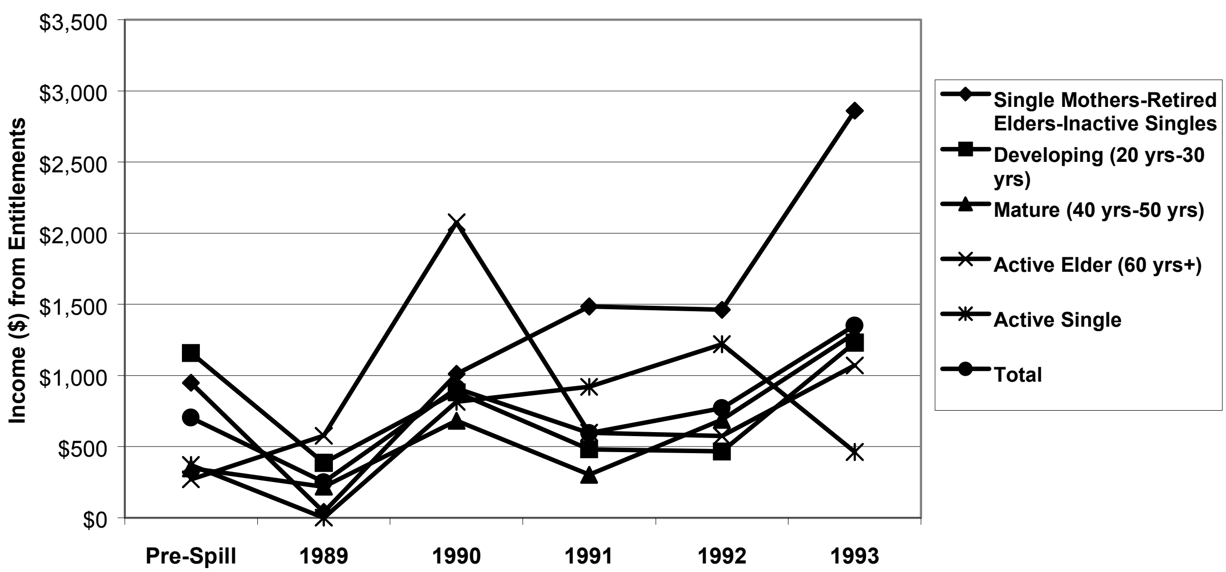


Figure VIII-10. Entitlement Income by Native Household Type, Four Alutiiq Villages Nearest the Oil Spill, Pre-Spill Year to 1993



mature households. The developmental cycle would not predict this to be the case. These findings suggest that in Alutiiq villages, young adults compete as well as older adults in the commercial wage sector. This may be due to more extensive educational backgrounds of younger adults, as discussed later. Incomes of active elder households move up and down between years. It is hard to advance any single explanation for this pattern.

Overall, incomes increased during the oil spill year for all household types (Fig. VIII-8). This was due to an increase in wage incomes, as shown in Figure VIII-9. Members from all household types were successful at obtaining employment above normal levels for the village during the spill year. There was a substantial demand for labor so that even household types with the lowest incomes prior to the spill (single mothers with young dependent children and retired elders) found some work, although not at levels of other households. Entitlement income fell during the spill year for most household types (Fig. VIII-10). Entitlements are unearned income to households with special social needs, including Aid to Families with Dependent Children, Supplemental Security Income (disability payments), Food Stamps, and Medicare. One unpredicted finding was that active elder households (household heads 60 years and older) earned the most income during the oil cleanup phase, compared with all other household types. The ability of elders to extract income from spill employment is notable. Survey information was not sufficiently specific to identify why elders earned so much. Perhaps the source of some of the income surge was leasing of boats. Elder households might own more boats relative to other household types.

DEGREE OF STABILITY IN FACTORS OF PRODUCTION

The above analyses suggest that a relatively stable social structure in Alutiiq villages underlay the highly changeable economic activities of households during the oil spill crisis. That is, during the post-spill period, the economic activities of households exhibited large changes in wild food production, wild food distribution, and commercial-wage employment. These changes were triggered by the threats of contaminated foods and the social imperative to intervene in the pollution of the Pacific Gulf coastline. Yet these changes in household functions are properly viewed as perturbations of household activities within a local social structure that remained relatively stable throughout the environmental crisis. The network of kinship-based groups underlying the mixed subsistence-cash economy continued to operate during the oil spill, though the mix of subsistence and cash activities of households shifted from year to year in response to the crisis. The ability of the households to quickly respond to new contingencies triggered by the oil spill crisis was rooted in flexibility of the kinship-based production system – flexible in the sense that under the traditional system, there is capacity for household groups to make the kinds of short-term economic adjustments in labor and resource allocations that were required by the disaster.

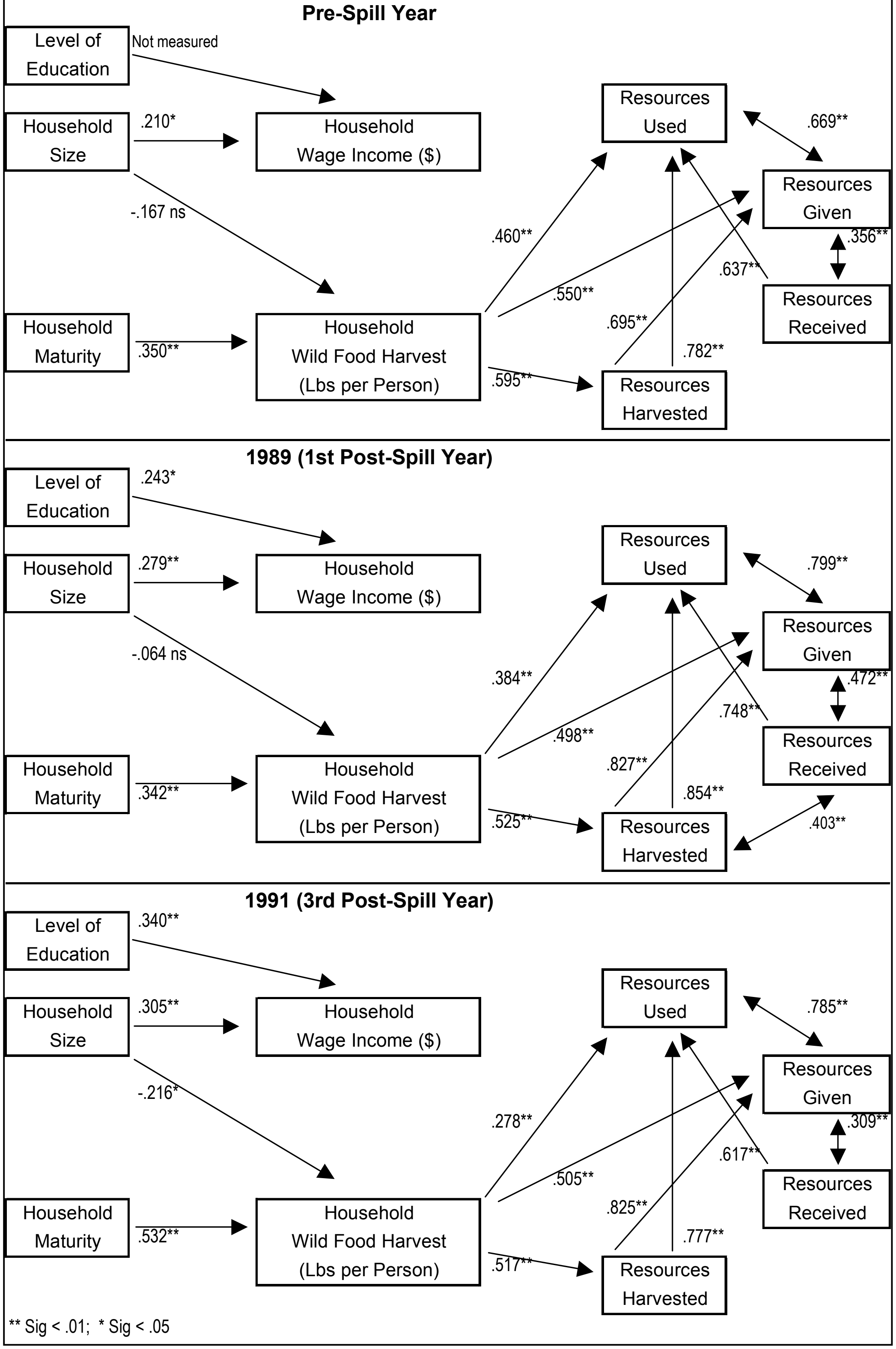
To examine the extent of structural stability within the domestic mode system, the following analysis describes the basic relationships between certain household factors of production and distribution before and during the early post-spill period. If the same relationships are evident in the patterning of factors across time, it suggests there was consistency in the social organization of production and distribution during the disaster.

In this analysis, we examined relationships (in this case, statistical correlations) between several household-level factors in the economic sphere. In particular, the analysis examined the relationship between a household's wild food harvest level, wage earnings, and the distribution of wild foods. These are central aspects of the economic sphere in Alutiiq villages -- wage earnings are part of the wage sector, wild food harvests are part of the subsistence production sector, and wild food distribution is part of the subsistence distribution system. Households participate in both economic sectors to varying degrees. Kinship-based groups are the principal “economic firms” and consumption groups within the subsistence sector. For analysis, Alaska Native households within four Alutiiq villages in Prince William Sound-Lower Cook Inlet (Chenega Bay, Tatitlek, Port Graham, and Nanwalek) were combined, and relationships were examined for all years with information – pre-spill, 1989, 1990, 1991, 1992, and 1993. The correlations for three years are shown in Figure VIII-11 (pre-spill, 1989, and 1991). The arrows suggest the causal direction of correlation, if one exists.

Looking at the four Alutiiq villages nearest the spill, the analysis shows that the household's maturational type was significantly associated with household wild food harvest levels prior to the spill (Fig. VIII-11). As a household matures in the normal developmental cycle, households tend to harvest more wild foods in the subsistence sector of the village economy. The maturity of the household was the factor most highly correlated with wild food production, among factors examined. Household maturity was not associated with household wage income. As a household matures with age, it does not tend to earn more income in the wage sector. This may be due to young persons having access to jobs and higher incomes because of better schooling than was available to older persons.

There were also strong and consistent associations between household wild food harvest levels and the distribution system of wild foods in Alutiiq villages nearest the spill (Fig. VIII-11). Within the villages, households that harvest greater quantities of wild food also tend to give away more types of wild foods to other households. Conversely, households that produce smaller quantities of wild foods also tend to distribute smaller numbers of wild food types. In this manner, the food production system and the food distribution system are directly related. Overall, high-producing households are high-giving households, as well as producing for their own consumption. In fact, giving is more strongly associated with harvest volume than is using, suggesting that high production is motivated as much by "giving" as by "acquisition." There appears to be reciprocity in the food distribution system. This is shown by the moderately strong associations between giving and receiving. The more a household gives, the more the household also receives. Over the course of a year, a gift given appears to generate other gifts received. Households that harvest a greater diversity of wild food types also use a greater diversity of wild foods within their own household. This shows that wild food production is production for use within the producing household, as well as production for distribution to other households.

Figure VIII-11. Correlations Between Factors of Production of Alaska Native Households in Chenega Bay, Tatitlek, Port Graham, and Nanwalek for Three Study Years



There was no statistically significant association between household wage income and household wild food harvests. One could not predict a household's wild food harvest level by knowing the household's earned income. Nor could one predict a household's earned income by knowing the household's wild food harvest level. Subsistence-wage relationships at the household-level differ from subsistence-wage relationships at the community-level, as shown earlier in Figure V-24. At the community level there were negative relationships between mean incomes and wild food outputs (see also Wolfe and Walker 1987).

While there was no relationship between wage income and wild food harvests at the household level, there were associations between wage income and other household factors. Two factors were consistently related to household wage income -- level of education of household members and number of people in a household. There were moderately strong positive relationships between education and wage income -- as a household's education level increases (measured as the highest educational attainment by a household member), so does the household's earned income from wages and self-employment. Similarly, as household size increases, so does household earned income. This appears to be because the number of adult workers holding jobs increases with household size. Wage income and number of adults in a household show an even stronger association than do household size and wage income. Therefore, pooled income by adult workers increases a household's wage income.

The relative stability of the structure of the mixed economy, measured at the household level, is suggested by comparing this patterning of factors in the pre-spill year with the patterns in 1989 (the first post-spill year) and 1991 (the third post-spill year) (Fig. VIII-11). While there are small changes in the magnitude of correlations between factors, the basic pattern of factors of production and distribution is essentially the same across all years. The best predictors for subsistence food production are the age and composition of household members, consistently across all the years. Consistently across the survey period, high-producing households distribute the most subsistence products. The relationships between wage income, education, and household size are consistent, as is the lack of relationship between the wage and subsistence sectors.

By these measures, there was stability in the basic organization of the factors of production and distribution during the oil spill crisis in the villages of Prince William Sound and Lower Cook Inlet. This is evidence that, at the local level of extended household networks, there was no collapse triggered by the strains of the spill. While the spill created major local disruptions of food procurement and employment patterns, the spill did not transform the pattern of relationships in the subsistence sector. The traditional extended kinship networks adapted to the short-term crisis of food production and distribution at the local level without major dislocations in the underlying structure of production and distribution.

ECONOMIC AND CULTURAL REVITALIZATION

One development from the spill has been economic and cultural revitalization within Alutiiq villages. Financial support for revitalization has come about through programs instituted by the villages using damage award settlements (see Tables VI-2 and VI-3). As stated in Chapter Six, Alutiiq tribal leaders lobbied vigorously to obtain a share of damage award settlements for villages as a class separate from the general public. Without this effort, there is doubt that a significant share of the settlement awards would have been directed toward Alutiiq villages in the spill area. In the first year of damage awards (the 1992 fiscal year), none of the civil settlement money went to community-based projects (see Fig. VI-2). It was only after an early period of lobbying by Alutiiq tribal leaders of the Oil Spill Trustee Council and other state and federal entities that the Alutiiq were successful in redirecting a portion of the settlement money into community-based projects designed to directly benefit villages. (Additional discussion of this topic can be found in the ethnographies prepared for this project, including Simeone and Miraglia [2000], Stanek [2000], and Mishler [2001]).

A major obstacle for the Alutiiq villages to overcome was the narrow conceptualization of injuries and injured parties within the federal and state legal systems. The legal system basically recognized two types of injuries -- individualized injuries to private parties (such as individual commercial fishers, owners of private land, or businesses) and shared injuries to the general public. Injuries to community-based tribal groups had no separate, legally recognized status. Tribal interests were viewed as a part of general public interests. As such, tribes would benefit as members of the general public from projects designed to restore the natural environment. As stated in Chapter Six, the Alutiiq villages pushed for recognition of the special injuries sustained by tribal members because of their historic socioeconomic and cultural dependencies on the injured natural environment. Eventually this position was conceded by the EVOS Trustee Council, who administered the civil settlement money, and by the Alaska legislature, who approved projects supported by the criminal settlement money.

The types of community-based projects instituted by Alutiiq villages with settlement awards have been designed to counter injuries perceived to be shared by the tribal group. Injuries to the natural environment lead to reductions in the subsistence activities of local, extended families, which in turn held the potential for eroding the transmission of cultural knowledge within the tribal group. Consequently, restoration projects were designed to restore the injured natural environment, bolster subsistence activities, and promote the flow of cultural knowledge so as to counter the injuries. The community-based, subsistence restoration projects that evolved, paid from settlement awards, are listed in Tables VI-6 and VI-7.

Up until fiscal year 2001, close to $15 million of settlement awards had been directed toward community-based projects in Alutiiq villages. Of this, about $9.2 million had come from the civil settlement (Table VI-6) and $5.6 million had come from the criminal settlement (Table VI-7). The projects fall into seven general types.

(1) Fish stock enhancement of local salmon species represented the largest number of projects (19 projects). Salmon enhancement was designed to increase the returns of wild stocks to the waters of community members. As a shared resource, the increased stocks benefited extended family networks harvesting for subsistence uses, as well as families with commercial fishers who harvested salmon for sale.

(2) Subsistence and educational facilities (11 projects) were designed to build public facilities of use to families for processing wild foods harvested for subsistence uses, or for launching boats used for subsistence activities (skiff docks). These projects were investments into an infrastructure benefiting subsistence users in the community.

(3) Cultural education projects (14 projects) were designed to promote the communication of customary and traditional knowledge about subsistence and the natural environment. This diverse set of projects included elder-youth conferences, hands-on youth area watch education programs, spirit camps, and documentary films on the importance of seal hunting and herring fishing to local communities.

(4) Wild food safety projects augmented tests of wild foods for contamination by hydrocarbons and paralytic shellfish poisoning. The purpose was to provide contaminant information to subsistence users so that they might make more informed choices about harvesting and using wild foods.

(5) Local mariculture development projects (Chenega Bay and Tatitlek) were designed to provide small-scale shellfish industries in each community. The project was designed to generate income for local family members and an additional source of food to augment local shellfish areas impacted by oiling and paralytic shellfish poisoning.

(6) Other Wild Resource Assessments were funded for harbor seal, octopus, shrimp, and surf scoter. These were resources of interest to local subsistence users for food or indicators of the health of the local ecosystem. The funding for harbor seal helped to launch the Alaska Native Harbor Seal Commission, a hunter association that has evolved into the main political entity representing subsistence users of harbor seals. The commission signed a formal co-management agreement with the National Marine Fisheries Service in 1999.

(7) Finally, Local Participation in Restoration projects funded an increased involvement of local village representatives in the restoration planning process.

While diverse, all projects have shared a community focus. They have been designed to benefit the injured community as a whole, rather than private parties affected by the spill. Successful projects were viewed to have outcomes that enhanced the subsistence economy and cultural values common to villages in the spill area. The "investment" of damage settlements into community-based programs has had the effect of revitalizing the local economy and traditional cultures of Alutiiq villages nearest the oil spill. This revitalization may not have developed at this pace had the oil spill not have occurred. The projects represent a conscious effort on the part of Alutiiq tribal leaders to redirect the public energy and resources generated by the oil spill calamity into something dynamic and positive for the Alutiiq villages.

Chapter Nine: The Legacy of the Oil Spill for Pacific Gulf Communities

This chapter returns to this study's original questions. How did human groups adapt to the *Exxon Valdez* Oil Spill, particularly the Alutiiq villages nearest the spill? Were responses to the spill primarily short-term, or do they portend longer-term changes for communities? In this chapter, the findings of Chapters Six through Eight regarding the responses of surveyed households and communities to the spill are summarized and placed into the wider context of the history and culture change in the Pacific Gulf region as presented in Chapters Three through Five.

The findings of this research can be used to assess alternative social constructions of the oil spill event identified in Chapter One. Social constructions draw upon a shared experience. Meanings of events are constructed through communication, frequently through contentious discourse between interests holding different levels of power, including governments, industry, fishing groups, and tribes. Social constructions mold the public meanings ascribed to the spill, which in turn can drive responses to the event. Because of their influential nature, the chapter begins with social constructions of the spill, followed by a summation of the adaptive responses of the Alutiiq to the spill and their short- and long-term consequences.

THE SOCIAL CONSTRUCTION OF A DISASTER

For most segments of the public, the *Exxon Valdez* oil spill was a relatively distant event indirectly experienced through the communication of government, the media, scientists, industry, and others. Few question the magnitude of the *Exxon Valdez* oil spill – the 11 million gallons of crude oil spilled over 1,200 miles of coastline ranks it among the major oil spills on record. However, beyond these basic facts, there has been extensive discord about how to characterize the size and significance of the effects of the spill on the natural environment, economy, public health, society, and culture (see Chapters One and Six). Characterizing effects have been at the center of scientific inquiry, public assessment, and litigated claims. These efforts involved billions of dollars. Much of the effort has been directly linked to self-interests of various parties, and the efforts will likely continue long after this report is released.

Divergent assessments of spill impacts were advanced by industry, government, and tribal groups in litigation (Chapter One, Table I-1 and Chapter Six). Social scientists under contract with Exxon Corporation asserted that the spill had made few major impacts on Alutiiq villages, but would become a "scapegoat" for a variety of preexisting economic and sociocultural problems in the region (Wooley and Bohannon 1994; Wooley 1995; Table I-1). By contrast, the Alaska Native class asserted that the spill's reduction of subsistence activities had lead to substantial economic and cultural losses by tribal groups (Table I-1). The state and federal governments asserted that injuries to the natural environment inflicted costs on the general public with interests in the Pacific Gulf for a variety of public purposes. As described in Chapter Six, for compensation to private Native claims deemed allowable under law, the federal district court ruled against Exxon in regards to economic damages. The court found that substantial economic losses from reduced subsistence harvests had been sustained by the Alaska Native class and awarded $20.0 million in compensation (see Chapter Six). Other private damages to commercial fishers and other private parties were still under litigation. For injuries to the natural environment affecting the public, Exxon Corporation was assessed a record $900 million in damages. The court rejected the claim that cultural losses to the Alaska Native class had resulted from the oil spill (see Chapter Six).

Beyond these litigated claims and court rulings, in public discourse there has emerged a generally held assessment of the magnitude of effects of the spill: the oil spill was a "disaster", but not a "catastrophe," "cataclysm," or arguably, even a "calamity." The choice of the term "disaster" to characterize the event has been part of an emergent social construction of the meaning of the oil spill in public discourse. In the nuances of English, a "disaster" is an occurrence inflicting great (or fairly widespread) destruction coupled with distress, hardship, or loss of life. The destruction caused by the *Exxon Valdez* oil spill was "environmental," and not "human," in the sense that the spill did not directly kill humans (such as the industrial disasters at Bhopal or Chernobyl) (see Enter-Wada et al. 1996). In the case of the oil spill, the natural environment of Prince William Sound suffered the direct destruction and loss of life, as witnessed by the counts of dead animals and miles of contaminated coastlines. These visible counts became emblematic for more complex and hidden injuries generally believed to have been triggered by the spilled oil and its movement through the natural environment (see Table VI-1 for the "official" list of injured resources). The environmental destruction produced distress and hardship to various individuals and groups who held interests in the natural systems, especially commercial fishing interests, subsistence harvesters, recreational users, and non-consumptive environmentalists. Distress and hardship were subsequent to the injuries to natural systems.

In the social construction of the oil spill in public discourse, it is instructive to note how the oil spill has not been generally characterized. The oil spill has not been characterized as a "catastrophe," a term which stresses a tragic outcome with irreparable loss. While the injuries have been great, and tragic to some users (such as the Alutiiq), they have not been considered irreparable in public discourse. In fact, the legal settlements of public claims between the petroleum industry and state and federal governments have been expressly directed to pay for activities which are alleged to restore, replace, or enhance injured natural systems (see Chapter Six for a description of this approach, which has not been without disputation).

Nor has the oil spill been characterized a "cataclysm," which connotes a sudden upheaval that brings about major change, like a revolution (social change). Within the Alaska body politic, the spill has triggered no social revolution in its wake – oil still flows from the pipeline, oil revenues still fuel the economy of urban Alaska, state government still strongly promotes the development of oil and gas on the North Slope, and so forth. The petroleum industry has not faced a revolutionizing public backlash in Alaska, such as the scaling back of domestic starts of nuclear power facilities following the radioactive releases at Three Mile Island in Pennsylvania (PBS/WGBH 1999). While not "cataclysmic" in general parlance, the spill was clearly a “cataclysm” for some individuals. In the spill area, the spill became a turning point in the lives of many. Some individuals moved. Friendships failed. Trusts were irrevocably broken. However, in public discourse these upheavals are conceptually “boxed” as personalistic, representing individual tragedies rather than transformations of whole communities. The exception to this statement may be Chenega Bay. As discussed below, for the people of Chenega Bay, the spill may yet prove to be “cataclysmic,” if that Alutiiq village does not survive the post-spill recovery period. But by and large, for the general public, and probably even for the majority of persons in the spill area, the spill was not so life changing as to warrant the appellation, “cataclysmic.”

It is less clear to what extent the “disaster” was a “calamity” in the general social construction of the spill. For some segments of the public, the spill was clearly a calamity, particularly for the Alutiiq villages nearest the spill, as described below, and commercial fishers in communities such as Cordova (Reynolds 1993; Picou and Gill 1996; Kenner 2000). For most others outside the margins of the spill, it was not. Beyond the general consensus that the spill was a “disaster” (and a “calamity” for certain groups), there is considerably less consensus on other characterizations. As stated above, there remain multiple assessments communicated within a number of social arenas. In the damage awards, the courts have had their say regarding who and what was injured and to what extent. Petroleum companies make their case in court and in reports to shareholders who vote and set prices of stocks. Regulators have expressed their view through new regulation, such as requirements for improved systems of petroleum transport. In biological journals, the natural scientists present findings on impacted environmental systems. Such assessments are additional social constructions of the spill event. They are sets of meanings constructed around the spill, communicated within social groups who are variously empowered to embrace and/or reject them, and used as a basis for action by human groups.

A CALAMITY FOR THE ALUTIIQ

For the Alutiiq nearest the spill, the *Exxon Valdez* oil spill was a heartfelt calamity. “Calamity” emphasizes the people’s feelings about the spill -- the great distress, grief, and sense of loss from the disaster. The greatest distress was felt within the Alutiiq communities of Tatitlek and Chenega Bay, whose traditional homelands were substantially covered by crude oil (of Prince William Sound coastline, 27 percent was “heavily oiled” and 21 percent “moderately oiled”) (see Chapter Six). In Tatitlek and Chenega Bay the spill year triggered an upheaval of community life. Nearly all adults worked in the massive first-year cleanup effort, a disheartening experience likened to a long, slogging military operation with few clear victories. Of the spilled oil, most remained unrecovered in the environment (see Chapter Seven). For Tatitlek and Chenega, the immediate tragedy continued longer than for any other segment of the public. As subsistence users, the Alutiiq of Tatitlek and Chenega resumed fishing, hunting, and gathering in traditional areas where unrecovered oil continued to be released into the local ecosystem. Since the spill, over the past decade, crude oil has become a part of the traditional ecology of the Alutiiq of Prince William Sound (see Chapter Seven). The Alutiiq believe the persistent oil continues to poison the waters, plants, and animals of their traditional homeland. This is what makes the oil spill a continuing calamity for them.

The Alutiiq of Tatitlek and Chenega were the segment of the public most vulnerable to an oil spill (see Chapters Three to Five). Their communities were highly dependent upon wild resources for food. The yearly patterning of family life was organized to a large extent around the seasonal harvest, distribution, and use of wild foods. Self-identities related to hunting, fishing, and processing. Cultural survival was tied to the continued use of a wide variety of traditional foods. The spill directly threatened the foundation of this way of life. The distress of the Alutiiq was the fear of a potentially great and irreparable loss – the fear of losing the very roots of village life because of an industrial accident. There were no other people as economically, socially, and psychologically vulnerable to the threats of environmental contamination in Prince William Sound as the Alutiiq.

The level of the distress, grief, and sense of loss from the disaster diminished relative to the distance from the spill center. The experiences in other Alutiiq villages in Lower Cook Inlet and Kodiak Island were buffered by distance and the degree of oiling of traditional village areas (see Chapter Six). In addition, the degree of distress was related to the cultural and economic dependencies of affected communities on the damaged natural environment. Although Valdez was nearest the oil spill, the spill was not experienced as a calamity in Valdez because of the cultural orientation of the urbanized populace and their marginal dependence on the natural ecosystem (see Chapter Five). As stated by Fogarty et al. (2000:56), "in talking about the oil spill, Valdez residents tend to compare it with the construction of the Alyeska oil pipeline and terminal… it seems that in Valdez, the oil spill's effect on the community is generally perceived as a social disruption, while in the rest of the sound it is generally viewed as a disaster." As shown by Picou and Gill (1996), the level of stress documented for Valdez residents was lower than for neighboring Cordova, a community substantially more dependent on commercial fishing.

ADAPTATIONS TO A DISASTER

Based on the findings of this report, the spill was a "determinative" event for those Pacific Gulf communities near its center, contrary to the assertions of industry's scientists. It was a clearly a "calamity" for nearby Alutiiq communities. The spill destabilized subsistence activities and associated social and cultural practices, as summarized below. However, the spill was not destructive of Alutiiq society or culture, contrary to claims of the Native class. It has been a catalyst for certain economic and cultural changes in the spill area, but these changes appear to be principally in terms of degree, rather than kind. The spill has provided the impetus for the elaboration and acceleration of sociocultural, economic, and sociopolitical trajectories already underway in the Pacific Gulf. Many of these changes may be beneficial to the Alutiiq as a distinct group, while others portend less certain outcomes at this point in history.

Impacts on the Rural Food Supply

The oil spill severely impacted the rural food supply. This effect varied regionally, with the greatest impacts in areas nearest the spill (see Chapter Seven). In the Alutiiq villages of Chenega Bay and Tatitlek, the two communities nearest the spill, wild food harvest and use were substantially reduced for two post-spill years. In the Alutiiq villages of Lower Cook Inlet and Kodiak Island, wild food harvest and use were depressed for a single year. In Alaska Peninsula villages, no measurable reductions in the rural food supply occurred. The impacts on wild food harvests in Valdez and Cordova are uncertain because of the lack of pre-spill or post-spill measures; however, they are thought to have been less due to the substantially less reliance on wild foods in Valdez, and the geographic separation of Cordova's subsistence harvest areas from the spill area.

The decision to reduce wild food harvest and use was quick and uniform across all types of households in affected communities (see Chapter Eight), indicating the response of existing, traditional sociocultural systems in Alutiiq villages. Wild food production and distribution were reduced to protect the public health from contaminated food products. This conservative course of action across all types of families was consistent with customary health practices of Alaska Native groups. In Alutiiq tradition, people are advised not to consume animals that appear ill or display abnormalities, so as to avoid becoming ill. The impact on the rural food supply entailed substantial costs to families -- it was economically expensive (the court awarded $20.0 million in compensation) and exceedingly distressing to give up traditional foods because harvest areas were contaminated with oil.

The impacts on the total volume of the rural wild food harvest were short-term effects, rather than long-term changes in spill area communities. Over the course of the recovery period, wild food harvest volumes increased to near pre-spill levels in most communities (see Chapter Seven). Alutiiq households have resumed the harvest and use of wild foods. However, ten years after the spill, harvesters report lower harvests of certain species in the Prince William Sound area due to local depletions, including herring, octopus, clams, harbor seal, and birds. Such depletions may be related to the oil spill (see Chapter Seven). Subsistence users in Prince William Sound remain angry about crude oil entrained in beaches within customary subsistence use areas. Harvest areas with visible signs of oil are avoided by harvesters because of continued concerns about health impacts.

It is doubtful that the short-term depression of wild food harvest and use resulted in long-term sociocultural losses for Alutiiq communities. Short-term contractions in the production and distribution of particular resources are not likely to result in the loss of cultural knowledge, skills, or values within families. Such losses would become of greater concern if contamination by the spill had necessitated longer-term reductions in wild food harvest and use (see section below on Cultural Revitalization). Families have experience dealing with annual variation in harvest productivity of particular species, as variability is characteristic of subsistence economic systems. However, the magnitude of impacts across a broad breadth of species was extraordinary during the disaster year. While the threat to health was massive, families utilized customary mechanisms to adapt to the crisis.

There is no evidence that the traditional organization of the subsistence sector was eroded by the spill (see Chapter Eight). Extended family networks continued to exercise substantial autonomy in the subsistence realm. State and federal governments played an advisory role, but did not interfere with local decisions regarding the rural food supply made by extended family networks (see Chapter Six). The government's de facto relegation of subsistence production decisions to the local family level empowered traditional social systems to deal with this aspect of the spill crisis. It is doubtful that government agencies could have been organized to make any better decisions regarding the safety of the rural food supply than were made by the extended families at the local level.

Impacts on Food Safety

The oil spill created new problems in public health assessment – to what extent were wild foods harvested in the oil spill area contaminated, and to what extent were contaminated food products unhealthful to consumers? Both government and industry were unprepared to provide information when it was needed early in the spill. Provision of information answering basic health questions lagged about six months to a year behind the time that decisions were made by families (see Chapter Six). The ad hoc interagency group of experts (OSHTF) formed to assess the health risks and benefits of consuming wild foods harvested from the spill area wedded expertise in scientific toxicology (NMFS Northwest Fisheries Center in Seattle), medicine (medical panelists convened by the state and federal agencies), and subsistence users. The inclusion of subsistence users in the health assessment program improved its responsiveness to consumers. Contaminant testing covered a longer time period and more areas and species because of the insistence of Alutiiq representatives. Many samples were collected by Alutiiq subsistence experts in traditional harvest areas. The OSHTF was coordinated by the federal Indian Health Service because the greatest risks were to Alaska Natives, the largest direct consumers of wild foods, with representation from tribal groups (North Pacific Rim and Kodiak Area Native Association), industry (Exxon Company), state government (Governor's Office, Health and Social Services, ADF&G, and Environmental Conservation), and the federal government (Indian Health Service and NOAA). The OSHTF developed a relatively narrow charge -- to provide information to consumers of wild foods, so that choices by subsistence users might be informed by medical and scientific assessments.

In balance, health assessment information was both palliative and frustrating to subsistence consumers (see Chapter Six). Over time, the medical advice and weight of information from tests assessed the health risk as low, if consumers used prudence in harvesting and using wild foods. This was based on three main features of the spill: the low toxicity of weathered crude oil relative to other industrial contaminants; the patchy oiling of subsistence harvest areas (unoiled and oiled areas existed); and the metabolic capabilities of major food species (vertebrates like fish and marine mammals) to protect their edible flesh from hydrocarbon accumulation (however, many invertebrate species do not). By the third year, the assessments of Alutiiq subsistence users in Prince William Sound appeared to be in general consonance with the OSHTF's assessment of food safety, as indicated by the recovering subsistence food harvests in the spill area and the opinions about food safety by surveyed households (see Chapter Seven). However, throughout the process subsistence users expressed substantial frustrations with the ambiguities inherent in scientific health assessments. The assessment program revealed that federal guidelines for exposure to most hydrocarbons did not exist. Tests of sampled wild foods were indicative, but never fully representative of conditions in all harvest areas or for all wild food types. Assurances regarding food safety could never be definitive, but only based on expert opinion with the information at hand.

Concerns over contamination appear to be one longer-term change for Pacific Gulf communities. There appears to be an erosion in the confidence of the health benefits of consuming wild foods directly due to the oil spill. Contamination of food chains from industrial sources appears to be an emerging issue in Canada and Alaska (Jensen, Adare, and Shearer 1997). The health assessments of the *Exxon Valdez* oil spill appear to have preceded by a few years a growth in the number of studies assessing contaminants in other Alaska areas (Alaska Office of the Governor, Arctic Contaminants Database 2000).

Activation of Traditional Support Networks

The oil spill impacted traditional distribution networks of wild foods in villages nearest the spill. Because of smaller amounts of wild foods harvested within affected villages, the amounts and diversity of wild foods distributed among households within villages were reduced (see Chapter Seven). Like harvests, sharing was depressed for two years in areas nearest the spill and one year in Kodiak Island communities. While sharing was reduced across all types of households due to limited wild food supplies, sharing was reduced least to the households of elders, single mothers with dependent children, and inactive single-person households (see Chapter Eight). Sharing of wild foods also rebounded more quickly for these types of households during the second post-spill year. In this manner, the most vulnerable segments of the communities received the greatest support during the oil spill crisis through the traditional subsistence distribution system. Rather than breaking down during the spill, traditional sharing networks operated during the disaster to channel the limited wild foods in the community to the most dependent households.

Replacement of Lost Subsistence Harvests

To replace the rural food supply lost during the oil spill and cleanup period, families purchased greater quantities of imported commercial foods. Short-term shifts in the contribution of wild foods and commercial foods in local diets are probably not uncommon in rural villages. The spill emergency activated this customary approach used by families to replace shortfalls in wild foods. Larger-than-normal monetary incomes earned by residents in oil spill cleanup during the first post-spill year (see Chapter Seven) were used to purchase additional commercial foods. Without the larger household incomes from cleanup employment, this food replacement strategy may not have been possible.

In addition, several emergency food programs provided assistance to households in some Alutiiq villages in the Prince William Sound and Kodiak Island areas (see Chapter Six). Exxon Corporation reportedly delivered groceries to households in Tatitlek, Chenega Bay, Nanwalek, and Port Graham during the first year (up to 800 pounds per person) (see Chapter Six). Several efforts by government, industry, and Alaska Native villages to ship wild foods into the spill area were attempted as food replacement programs (see Chapter Six). Of apparently substantial amounts of wild foods shipped into Chenega Bay and Tatitlek, most was discarded by recipient families because of concerns over product quality. Only about 30 lbs per person of wild foods were actually used in Chenega Bay (see Chapter Six). The experience suggests that wild food replacement programs may fail unless product quality can be guaranteed throughout handling, shipment, and distribution. Emergency monetary awards or food vouchers from government to households would likely have accomplished the same purpose in situations where income from employment was unavailable.

Impacts on Employment and Wage Income

As a short-term response, resident households in the spill area increased their level of wage employment by working in oil spill response activities. Based on household surveys, there was a single year's increase in employment for most communities (see Chapter Seven). During the oil spill year, household incomes showed a marked increase in Alutiiq villages, due to the higher wages and greater labor demands created by the emergency. Higher incomes were reported across all types of households during the spill year (see Chapter Eight). When the spill cleanup phase ended, household employment and incomes returned to pre-spill levels.

This employment response by households can be understood as a readjustment of household labor between two economic sectors of the village economy. Households decreased the production and distribution of wild foods and redirected labor into spill cleanup employment. In the domestic mode of production, labor is organized within domestic family groups. It is the norm for households to maintain a foot in the two economic sectors during an annual cycle, flexibly combining monetary employment and wild food harvesting activities. The wage sector of village economies historically has been insecure and, at times, volatile due to economic factors external to the community, such as changing markets for exported fish and furs, or the changing availability of federal and state grants (see Chapter Four). Over time, households have had considerable experience redirecting labor to one or the other sector, depending upon prospects during the current year. In this regard, the village households' rapid contraction of subsistence sector activities and expansion of wage sector employment during the spill year was the application of a common economic strategy by domestic family groups.

Over the longer term, the wage sector of the village economies in the spill area have seen some modest gains following the spill. These are related to increased local employment opportunities resulting from restoration grants and spill response infrastructure (see Chapter Eight). There is also the potential for additional capitalization in local industries, should households invest settlement awards and corporate earnings from land sales into the village's wage and subsistence sectors. Investment into small-scale recreational services is one possibility, as tourism was increasing on Kodiak Island and in Prince William Sound during the late 20th century. The capturing of spill response money through community-based project grants was part of an established economic strategy of village governments. Toward the end of the late 20th century, federal and state funds funneled through municipal and tribal governments have been a major source of money supporting employment in rural villages. The identification and acquisition of grant money from federal and state sources to produce local wage employment was one primary function of village governments. That the Alutiiq villages responded to spill settlement awards as a potential source of funds to create local jobs was a continuation of this longer-term economic strategy.

Economic and Cultural Revitalization

One outcome of the oil spill has been the intensification of economic and cultural revitalization as a social movement within Alutiiq communities. Revitalization emerges from the development and implementation of community-based programs instituted by the villages using damage award settlements (see Table VI-2 and VI-3 and Chapter Eight). In their damage claims, the Native class feared that the oil spill presaged broad cultural losses for affected villages because customary subsistence activities had been disrupted. This concern motivated tribal leaders to work towards developing programs to counter this potential for long-term economic and cultural erosions. The fruit of these efforts has been substantial – close to $15 million of settlement awards had been directed toward community-based projects in Alutiiq communities during the restoration period (see Chapter Six). Over the ten-year recovery period, the effort to revitalize the economy and culture of injured villages has included the development and implementation of a diverse set of community-based programs, including fish stock enhancement, investment in public subsistence facilities, cultural education conferences, spirit camps, local mariculture industries, political organization of harbor seal hunters, and contaminated foods testing.

That revitalization efforts followed the oil spill disaster is not an unexpected social outcome. Threats to survival of social groups often can trigger revitalization efforts. In the Pacific Gulf, the tragic loss of commonplace subsistence activities, and the prospects for future losses, undoubtedly raised local customs, traditions, and cultural values to a new level of personal and public awareness for Alutiiq villagers. Litigated claims and settlement fund lobbying undoubtedly forced village leaders to articulate these threatened customs, traditions, and cultural values in new ways and within new public forums. The ruling in federal court that cultural values in villages were no different in kind from the values held by the general public (see Chapter Six) fell like an unjust blow on the Native class, who knew otherwise. Reactions of anger and a sense of great social injustice upwelled in Alutiiq villages following the ruling. The perceived threats to the local culture fueled an energetic and active response within affected villages. The external threats triggered a unified effort to protect and preserve the local group. The channeling of restoration money into projects to benefit the villages as a distinct type of social entity was an understandable response.

Community-based programs were rapidly developed and implemented in Alutiiq villages. The rapidity of response was due to existing institutionalization of community-based programming as village revitalization. Economic, cultural, and political revitalization was already established as a social movement, predating the oil spill (see Chapter Four). The landmark of Native land claims in 1971 led to proliferation of new Alaska Native institutions, charged with promoting the economic, social, and cultural development of indigenous groups in rural areas. The protection of subsistence practices of Alaska Native peoples was a focal political issue in this social movement. Development of local infrastructure, industries, and jobs that helped stabilize rural villages were other goals. The efforts to reclaim and revitalize indigenous languages, culture histories, and expressive culture (crafts, art, and dance) were yet others. The rediscovery and re-exercise of tribal powers was a political focus. All these represented efforts within a single, growing movement in the late 20th century. Through social revitalization, Alaska Native peoples were expressly countering the assimilationist policies of the late 19th-and-early-20th century Alaska. The oil spill did not create the revitalization movement in the Pacific Gulf. However, the oil spill clearly intensified the movement through the increased flow of money into community-based programs.

Economic and cultural revitalization was not an inevitable outcome of the oil spill, however. The reinvestment of money into the subsistence economy and local culture represents considered choices by leaders and the broader-base membership of the tribal group for responding to the oil spill crisis. The choices involve naming Alutiiq culture as entailing things of distinction and value, and directing group actions in ways that were thought to support it. It is too early to assess whether the types of community-based programs instituted with restoration money in fact accomplish their purposes. Will salmon runs return in larger volume because of enhancement programs, and will the runs support continued subsistence harvests? Will newly completed public subsistence processing facilities in villages be used in ways that enhance the customary subsistence practices of extended families in the villages? Will the Alaska Native Harbor Seal Commission, as a new sociopolitical organization, strengthen the customary patterns of use of harbor seals Alutiiq hunters? Will elder-youth conferences result in a greater intergenerational transmission of local knowledge? These may be answered in time. But for now, it is clear that the collective effort to develop and implement such community-based programs as a response to the external threats posed by the spill, has intensified efforts toward economic and cultural revitalization as a general social movement within Alutiiq communities.

Impacts on Demographic Trends

There has been no apparent out-migration of residents from the Pacific Gulf after the spill, as sometimes follows disasters. The damage to the natural environment and the distress to the people have not been such to trigger an exodus from the region. Nor has there resulted any apparent permanent influx of persons. Thousands of newcomers surged into the region for work during the cleanup period, primarily through Valdez. The normal life of towns and villages was temporarily "turned upside down" by the surge, straining facilities and services, and placing severe stress on local governments in staging, logistics, and political control (see Chapter Six). However, the demographic surge subsided with winter curtailment of the cleanup effort. Cleanup workers returned to their respective homes, rather than stay in the region. Like a classic boom-and-bust cycle, few workers apparently remained after the bust.

If anything, ongoing demographic trends in the Pacific Gulf were reinforced during the post-spill period of restoration. Valdez captured the largest number of new permanent jobs resulting from the spill (about 75-100 high-paying, year-round jobs with the new Ship Escort Response Vessel System (SERVS)), jobs which solidify or expand its already growing population (Kenner 2000:20). Management of SERVS has awarded to TCC, a consortium of the Tatitlek Corporation, Chenega Corporation, and Chugach Alaska Corporation, with a hiring preference for Alaska Natives. These jobs have drawn a few residents away from Tatitlek and Chenega Bay, continuing the ongoing direction of flow of people from village to town and city. While some productive subsistence harvesters in Tatitlek have taken work in Valdez in the SERVS, surveys provide no evidence that these relocations have transformed subsistence harvest patterns in Tatitlek.

Major demographic trends in the Pacific Gulf appear to have been unaffected by the oil spill. The growth of the region's population continues through in-migration by people from outside the state, attracted in waves by developing employment opportunities (see Chapter Four and Chapter Five). Valdez, Kodiak City, and Seward continue to absorb most of the new arrivals. The Alutiiq villages, with only modest growth, are increasingly becoming a smaller proportion of the region's population. Many Alutiiq continue to be drawn to the larger towns and cities because of more stable employment in comparison with the villages.

Dispossession of Native Lands

The dispossession of Alaska Natives from traditional homelands, a long-term trend in U.S.-tribal political relations, was accelerated by the *Exxon Valdez* oil spill. The separation of Alaska Natives from land holdings was a major, unexpected consequence of the oil spill (see Chapter Six; see also Simeone and Miraglia 2000, Stanek 2000, and Mishler 2001). By the tenth anniversary of the spill, the title to an estimated 452,586 acres of Native land had been sold to the state and/or federal government as part of the habitat protection program of the *Exxon Valdez* Oil Spill Trustee Council. Conservation easements on an additional 167,731 acres had been purchased, as well as timber rights on an additional 15,453 acres. Tribal groups selling major portions of their traditional lands for spill restoration money included Tatitlek, Chenega Bay, and Eyak (Cordova) in Prince William Sound; Nanwalek and Seldovia in Lower Cook Inlet; and Ahkiok, Old Harbor, and Koniag Corporation on Kodiak Island. The sales of title in fee simple represented about half the Native lands for these Native groups. While this group of land sales probably would not have occurred except for the oil spill, the stage had been set for the further alienation of Native lands by the Alaska Native Claims Settlement Act in 1971, itself strongly linked to oil development (the transport of North Slope crude oil over disputed lands forced the United States to settle land claims with Alaska Natives) (Case 1984).

As part of a series of sociopolitical events, the oil spill restoration program indirectly has accelerated historic assimilation processes in Pacific Gulf tribes. Historically, assimilationist policies of the United States government, typically with support from state governments, have used the dispossession of Native groups from traditional lands as a central tool for terminating recognition of tribes and severing special relationships with Native Americans as tribal peoples. In the case of Alaska, U.S. Congress chose not to recognize rights to tribal lands through treaties, the principal vehicles governing U.S.-tribal relations elsewhere in the United States (Case 1984:14-20; Berger 1985:20-21). "Indian country" in Alaska has not been recognized in federal courts, except in a few special instances (such as the Metlakatla Reserve). Under ANCSA, claims to most traditional lands were sold to the federal and state governments. The political position of indigenous groups in Alaska was substantially weakened when settlement money and Native lands were awarded to Native corporations, rather than to Native tribal governments. Because the conveyed Native land holdings became assets held by corporations charged with making money for shareholders, ANCSA presaged future losses of Native lands through sales (Berger 1985:73-95). Following the oil spill, the habitat protection program within the restoration process made the potential sale of lands a reality on a large scale.

Based on the evidence of this study (see Chapter Six), it would be difficult to attribute the sales of Native lands to any single economic or sociopolitical strategy. There were balances of multiple factors weighed within Native communities. In the mixed economies of villages, Alaska Natives require some regular income flow to survive. Commercial fishing, a historic village mainstay, was in decline during the past decade in the Pacific Gulf region, depressed by the growth of international fish farming (see Chapter Four). Many families were moving out of commercial fishing, as it could no longer generate sufficient profit (see Mishler 2001:186; Stanek 2000:93). For the Native regional and village corporations established under ANCSA, turning corporate holdings into income for shareholders was difficult. For example, Chugach Alaska Corporation (the regional corporation for the Prince William Sound and Lower Cook Inlet villages), declared bankruptcy in 1991 primarily because of poor investments in fisheries and timber (Loshbaugh 1999). By the mid-1980s, Koniag Inc. (the regional corporation for the Kodiak Native communities) "was near financial ruin" due to court battles and massive losses from fisheries investments

(Brown 1999). As the president of the Tatitlek village council observed, corporations have a fiduciary responsibility to place key decisions concerning their financial interests before their shareholders (Simeone and Miraglia 2000:145). And shareholders faced difficult choices. If Native lands in Prince William Sound, Cook Inlet, or the Kodiak Archipelago were logged, sustainable subsistence harvests or potential tourism values might be compromised. For many shareholders, land sales to public conservation units became part of a two-pronged strategy: corporate investment of the land-sales money might provide a way to generate future income for shareholders while preserving habitat values of local lands, both of importance to the future survival of Alutiiq communities (Stanek 2000:78). In the short term, the sales would help provide income to Native families. Future income to families would depend on returns to corporate investments. Whether individuals and communities will benefit or lose from this economic strategy remains an open question.

The political and cultural survival of indigenous peoples are strongly linked to control of land. Political power is buttressed by a secure geopolitical base. There is no doubt that Alaska Native tribes in the Pacific Gulf are politically weakened by the loss of lands. In regards to the traditional lands sold following the oil spill, future control over access will be held by state or federal land managers, not by an Alaska Native corporation. Tribal members will be required to request permission of state or federal governments to access traditional lands. Access for subsistence uses will be granted based on the relatively weak protections of rural subsistence uses in ANILCA, and not based on the recognition of Alaska Native rights to fish and hunt. Decisions concerning future use of traditional lands, such as for tourism development, will be made by state or federal entities, and not by an Alaska Native corporation. As major landholders, Alaska Native groups were more likely to have status and influence in high-level decisions -- interests accorded by land ownership are a basis for gaining a "seat at the table" in government and industry deliberations. The loss of lands means the loss of this geopolitical status. In this way, the sales of Alaska Native lands have continued the historic erosion of power and influence of the Pacific Gulf Alutiiq as tribal peoples in the political sphere.[1]

The Survival of Alutiiq Communities

All Alutiiq communities survived the oil spill itself, but all communities may not survive the period of restoration and litigation. As stated in Chapter Two, the hallmark of success of human adaptative responses is the continuance of the social group as a recognizable entity. By this measure, the Alutiiq have been a struggling, and yet perdurable people over two centuries of post-contact colonialism. A Pacific Gulf population has maintained its distinctiveness as Alutiiq while the region absorbed waves of Russians, Scandinavians, and Euroamericans. As the 21st century dawned, the cultural revitalization of distinctive marks of Alutiiq self-identify (such as traditional subsistence foods, religious orthodoxy,

[1] It must be noted that the role of Alaska Native people and tribes in oil spill restoration was enhanced by the federal Oil Pollution Act of 1990. Section 1006 of the act contains provisions for the designation of "Indian Tribe Trustees" for the purpose of natural resource damage assessments and for developing and implementing restoration plans.

language, and dance), were self-conscious expressions of a will to survive as a distinct people. Overall, the oil spill disaster appears not to have undermined this struggle to survive as a distinct peoples, and may have supported it through the funding of revitalization programs.

However, it is far from clear whether Alutiiq villages will be strengthened or weakened by the windfall money from the oil spill restoration land buybacks and litigation. The wellspring of Alutiiq identify is the small culturally homogeneous village, where much of the local society is ordered through extended kinship networks and supported by distinctive mixed, subsistence-cash economic systems. Beneath the inconstant outside winds of change, village life is bulwarked through kinship networks and kinship-based obligations. Yet, what happens to village life when winds blow up a blizzard of money?

Windfall money from land buybacks and litigation may disintegrate Alutiiq communities to the extent it is used by Alutiiq families to move from the village to the towns and cities. Money allows people to move from family problems in the village, such as alcoholism, abuse, or failed relationships. Money allows the purchase of second homes in towns and cities, drawing families away from the village home. Money allows for individuals to travel, to attend school, to seek employment elsewhere. When a village's population of children diminishes below a critical threshold, the public school closes, and families with children must relocate to find schools. As a village infrastructure withers, jobs leave, and the village dies. And if the villages die, then the Alutiiq may also disappear as a distinct people. The Alutiiq may be swallowed up within the dominant Euroamerican culture of places like Anchorage, Valdez, and Kodiak City.

There are signs that this may be happening in Chenega Bay, as the village's population had diminished from about 93 persons (1996) to 69 persons (1999), based on Alaska Permanent Fund Dividend mailing addresses tracked by the Alaska Department of Labor (2000:138). Subjective reports indicated that the village might be failing. Following the catastrophic tsunami of the Great Alaska Earthquake in 1964, the families of old Chenega were scattered for two decades. After a protracted effort, the new village of Chenega Bay was reborn in 1984. Only five years later, it was hit by the oil spill disaster. Among affected communities, its traditional use area suffered the greatest amount of oiling. As the community with the shallowest roots in the Pacific Gulf, its population may not weather the stresses of the second disaster. The village corporation sold half its lands for oil restoration money. One estimate places the value of the sale at half a million dollars to each Chenega shareholder. The restoration's monetary windfall might be used by individual shareholders to fund a second diaspora of Chenega's people. If so, the Alutiiq community of Chenega Bay may not survive the oil spill disaster.

On the other hand, the monetary windfall from land sales and litigation might be used by families to strengthen villages and village life. Villages will be strengthened if families invest the money locally, upgrading homes, augmenting subsistence equipment, and supporting members of local kinship networks. There are signs that some families intend to use the windfall to capitalize in tourist-related business, as guides, innkeepers, and merchants. Greater security in the cash sector of the local economy would help support the village and village life. It is likely that some families in communities will use the money for both ends. Some families will use the money to move, while others will use the money to stay. It is too soon to assess the long-term consequences of these choices for the survival of the Alutiiq as a distinct cultural group.

In retrospect, the *Exxon Valdez* oil spill was an unprecedented industrial disaster in the Pacific Gulf portending large and uncertain threats to Pacific Gulf communities. As shown in this research, the Alutiiq adapted at several levels to the spill, its cleanup, restoration, and litigation. At the family level, responses served to reduce risks to public health, preserve the economic survival of family groups, and support vulnerable segments of the community. At a tribal level (that is, the community level above the family), the Alutiiq have worked toward preserving and enhancing the economy and culture of the local community and its subsistence use areas. These adaptations by the Alutiiq at the local level occurred within the context of massive responses by state and federal agencies and Exxon Corporation. Some developed as part of these responses, and some independent of them.

The spill has been a catalyst for change in the Pacific Gulf region. New conditions have followed in the wake of the spill. Seeps from oil-entrained beach gravels make crude oil a continuing presence in the local ecology of Prince William Sound. The contaminated areas impel the Alutiiq to employ a new cautiousness in harvesting and using wild foods from their traditional homeland. The feelings of the Alutiiq people about the spill are merged with these new damages inflicted on their traditional homelands. A few new features in villages have appeared following the spill, such as boat docks, fish enhancement and mariculture ventures, and subsistence processing facilities, purchased with settlement money. Extended families continue traditional lifestyles, blending age-old subsistence practices with the ebb and flow of local commercial prospects. New income streams to families appear to be flowing from Native corporation decisions to sell Native lands. And other new income streams may open pending settlement of litigation.

For the Alutiiq nearest the spill, the disaster was a calamity, but never a “debacle”. There was no sudden collapse beneath the strain of new, overwhelming forces. At the local level, the spill was temporarily destabilizing in Alutiiq villages and other communities in the Pacific Gulf region. But the spill did not disorganize or disintegrate the traditional society or culture of the Alutiiq. On the contrary, in the short term, the traditional social order of the Alutiiq proved itself fit for handling most major elements of the crisis affecting households at the local level. And the future of Alutiiq villages and their cultural distinctiveness likely will be built upon the new ecological and socioeconomic conditions emerging since the spill disaster.

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