

SCOMM

95:5

Alaska

SEAFOOD INDUSTRY

If Alaska were an independent country, it would rank among the top ten world seafood producers - ahead of Canada, Norway, Iceland and other famous fishing nations. The more than 5 billion pounds of seafood harvested off Alaska represents more than half of all seafood harvested in the United States. The total value of Alaska seafood production is more than \$3 billion. Direct exports of Alaska seafood total more than \$1.5 billion.

The seafood industry is vitally important to the Alaska economy. It is Alaska's largest private-sector employer. More than 35 thousand Alaskans work in fish harvesting or processing. More than one-fifth of Alaska employment is attributable to the Alaska seafood industry, directly or indirectly. Paying more than \$87 million in taxes and fees in FY 1993, the seafood industry is second only to the oil industry in its contributions to state government.

During the 1980s, domestic harvests of Alaska seafood increased by nearly 500 percent, as American fishermen and processors took over Alaska's offshore fisheries. Over the last six years Alaska seafood harvests have stabilized at more than 5 billion pounds per year.

Unlike many of the world's fisheries, Alaska's fisheries resources are healthy. Neither over-harvesting nor environmental problems are major threats to Alaska's fisheries. Recent international agreements will help to control harvests of Alaskan fish on the high seas.

But despite healthy resources, the Alaska seafood industry faces troubled times in the 1990s, the combined result of changing markets and overcapitalization. Increasing competition coupled with recessions in major markets has led to sharp price drops for many species. In many fisheries, chronic excess capacity -- more vessels than are needed to catch the fish -- has led to plans to limit access to many fisheries. As it adapts to lower prices and new management regimes, profound and lasting changes in the harvesting, processing and marketing sectors will likely transform the Alaska seafood industry in the 1990s.

Major Fisheries Locations in Alaska



Produced by the Division of Economic Development

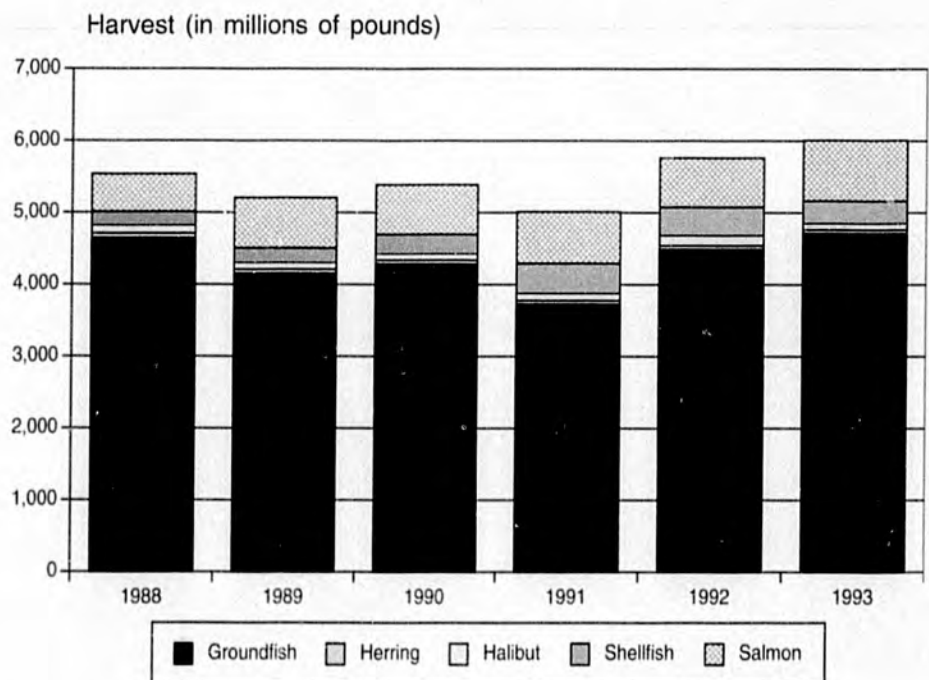
Commercial Harvests

Five types of salmon (chinook, coho, sockeye, pink, and chum) are harvested commercially in Alaska waters. Tanner, king, and dungeness crab make up most of the shellfish harvest, but shrimp and other shellfish also contribute. Herring are harvested for roe (eggs), food, and bait. Pacific halibut from Alaska waters makes up most of the world's halibut supply.

Many kinds of groundfish are harvested in the waters off Alaska, but the most common species groups are Alaska pollock, Pacific cod, flatfish, rockfish, and sablefish. At the beginning of the decade foreign trawlers took 98 percent of the groundfish catch in Alaska's offshore fisheries. But because of the preference to domestic processors written into the federal Magnuson Fishery Conservation and Management Act of 1976, the foreign fishery was phased out.

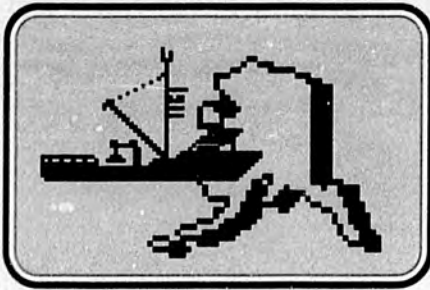
Harvests off Alaska by American vessels soared 500 percent between 1980 and 1988, increasing from 1 billion pounds to more than 5 billion pounds. Tremendous growth in the domestic groundfish catch accounted for most of the increase, as American fishermen and processors took over the offshore fisheries from foreign fleets. Since 1988, total harvests have stabilized, although there are significant fluctuations in the annual harvests of some species, particularly crab. The salmon harvest set records in 1991 and again in 1993.

Seafood Harvests 1988 - 1993



This chart shows total harvests in millions of pounds. Harvests are the total weight of seafood delivered by fishermen. The 1993 data are preliminary.

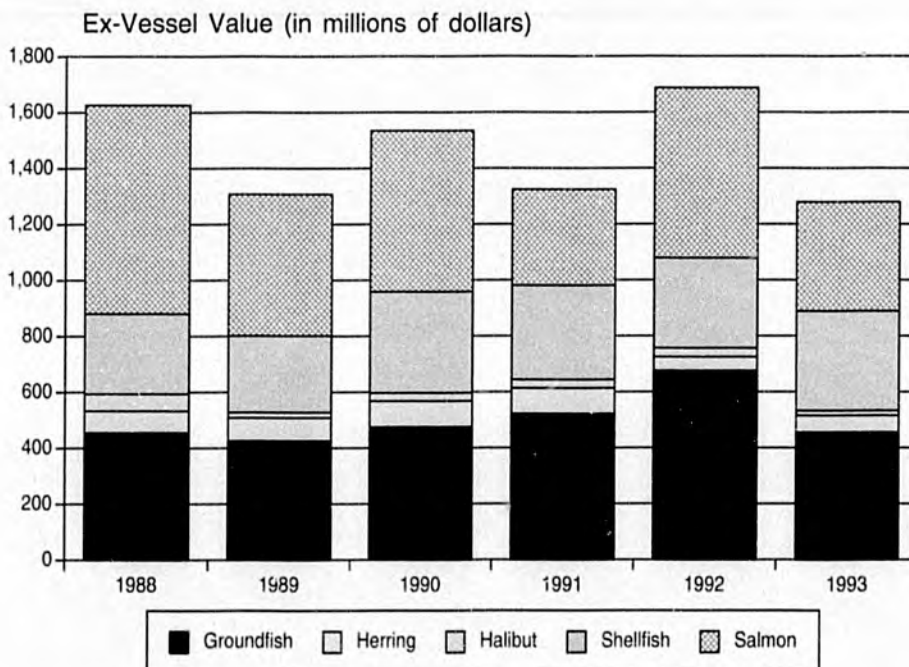
Harvests and Ex-Vessel Value



Commercial fishermen use a variety of vessels and gear types to harvest Alaska seafood and are regulated by several agencies under different management systems. The Alaska Department of Fish and Game manages the salmon, crab, and herring fisheries. The North Pacific Fishery Management Council manages groundfish off Alaska. The International Pacific Halibut

Commission (a joint treaty organization of the U.S. and Canada) determines harvest quotas for halibut, while the North Pacific Fishery Management Council manages how halibut is harvested.

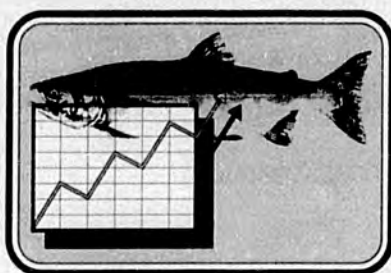
Ex-Vessel Value 1988 - 1993



This chart shows ex-vessel value in millions of dollars. Ex-vessel value is the total money processors pay fishermen for fish they deliver. The 1993 data are preliminary.

Fluctuating harvests and prices cause wide changes in what fishermen are paid for their catches from year to year. The value of Alaska harvests more than doubled between 1981 and 1988, as groundfish harvests grew rapidly and the price of salmon rose sharply. Salmon brought fishermen more money than any other species in the 1980s. But as the size of the groundfish harvests grew ever larger and salmon prices dropped in the late 1980s, the ex-vessel value of groundfish moved closer to that of salmon and surpassed it in 1991. Sharply lower prices for both salmon and groundfish in 1993 caused the total catch value to fall by 25 percent, even though the total catch volume rose by 4 percent.

Production and Wholesale Value



Alaska's seafood harvests are processed into a myriad of wholesale products in a variety of ways — from simple operations such as freezing the fish to high-technology operations that create products like surimi, a paste made from the whitefish flesh. Multiple products, such as pollock fillets and fish meal, may also be produced from a single fish.

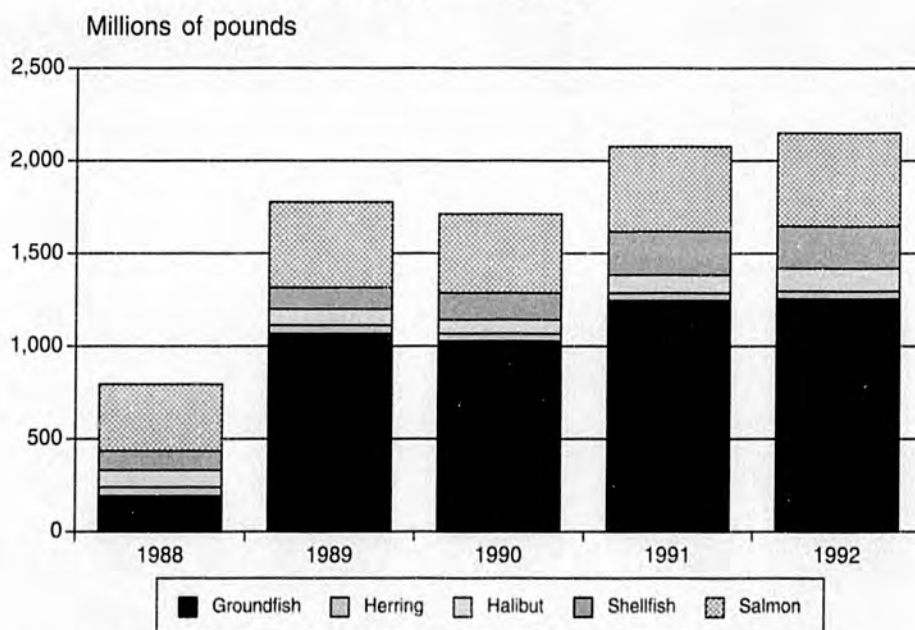
The percentage of total weight remaining after processing is known as the yield. Yields vary in different processing operations. For example, a heading and gutting operation may have a 75 to 80 percent yield, while surimi operations typically have yields in the 15 to 20 percent range.

In the groundfish and crab fisheries some processing is done offshore on vessels which also harvest (catcher/processors) or which take delivery from catcher vessels (mothership/processors). Otherwise, processing occurs at shoreside plants in Alaska, and to a certain extent, in the Pacific Northwest.

The groundfish catch is split between offshore processors (which employ mostly nonresidents) and onshore plants in Alaska (which create more local jobs). Groundfish allocation has become controversial in recent years. The North Pacific Fishery Management Council in 1992 for the first time specifically allocated portions of future groundfish catches to onshore and offshore processors. Part of the groundfish catch was allocated to western Alaska villages as Community Development Quotas to promote rural economic development and participation in the fishing industry.

Groundfish led growth in production. Increasing sixfold in six years, groundfish production jumped from about 22 million pounds in 1984 to 1.2 billion pounds in 1990 where it has remained fairly constant. Groundfish production has become so large that even with much lower processing yields, the resulting production outweighs salmon production.

Total Production of Seafood Industry 1988 - 1992



This chart indicates production in millions of pounds. Production is the weight of the processed seafood product and does not include the unused portions of the fish or crab.

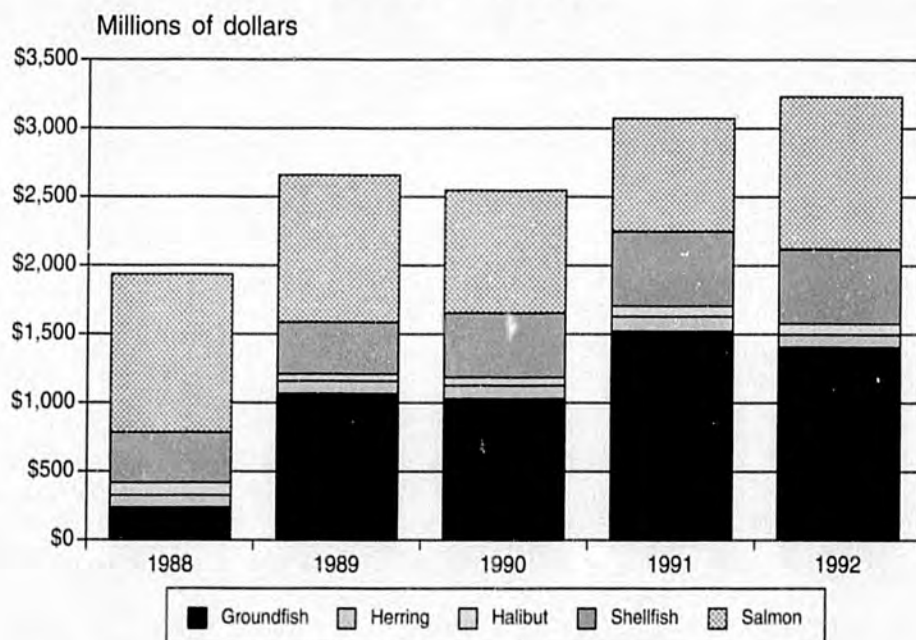
Alaska's Role in U.S. and World Seafood Markets

Alaska's seafood harvests would have ranked ninth among the world's fishing nations in 1992. Alaska's 1992 harvest was more than five times as large and more than four times as valuable as any other state. In most years, Alaska waters provide more than 80 percent of world harvests of Pacific halibut and tanner crab, more than 70 percent of sockeye salmon, and well over one-quarter of world harvests of pink salmon, coho salmon, king crab, Dungeness crab, Pacific cod and sablefish.

Direct exports of Alaska seafood totaled more than \$1.9 billion in 1992, including \$433 million of salmon, \$432 million of surimi and fishsticks, \$383 million of shellfish and \$241 million of roe. Almost 90 percent of direct Alaska seafood exports went to Japan, which imported more than \$1.7 billion of Alaska seafood in 1992. Alaska's second most important direct export market is Korea, which imported \$111 million of Alaska seafood in 1992. Total exports of Alaska seafood are far higher than direct exports because a large portion of the harvest is shipped to other states prior to export. For example, in 1992 U.S. exports of salmon -- almost all of which was harvested in Alaska -- totaled \$840 million, or almost double the value of the salmon exported directly from Alaska.

Japan buys most Alaska exports of fresh and frozen salmon, herring, and crab. The United Kingdom, Canada and Australia provide the biggest export markets for canned salmon. Historically, most groundfish from Alaska waters and other areas of the North Pacific was processed as surimi and exported to Japan. But recently U.S. and European markets for Alaska groundfish blocks and fillets have developed.

Wholesale Value of Seafood Production 1988 - 1992



The wholesale value of Alaska production tripled during the 1980s and continued to grow in the early 1990s. But lower prices will likely lower total wholesale value in 1993 and 1994.

This chart indicates the wholesale value in millions of dollars. Wholesale value is the money paid to the seafood processors.

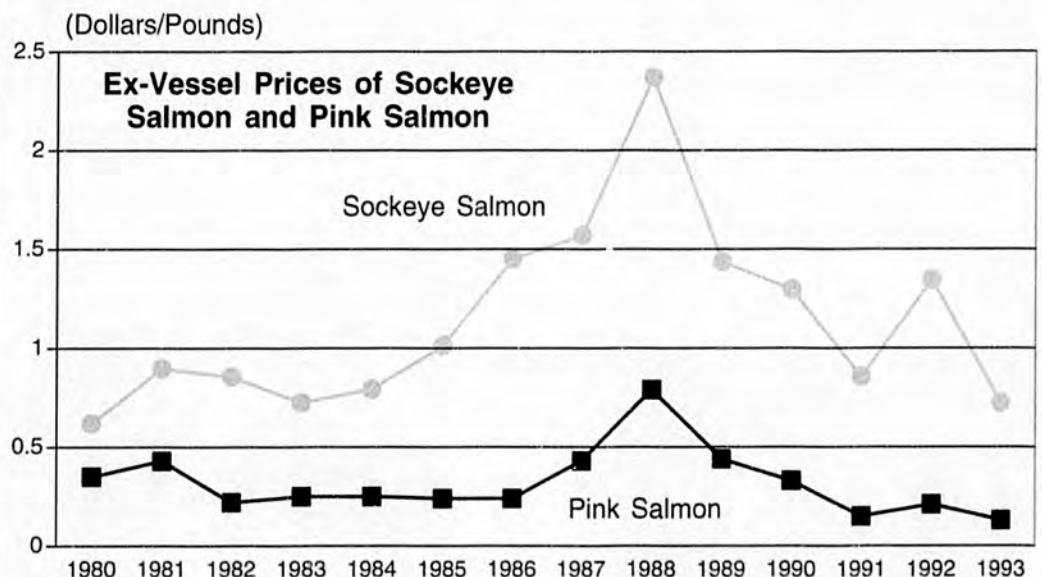
Alaska Seafood Industry in the 1990s

Unlike many of the world's fisheries, Alaska's fish stocks are healthy, but the Alaska seafood industry faces major market and management challenges. Profound and lasting changes in the harvesting, processing and marketing sectors will likely transform the Alaska seafood industry in the 1990s.

Growing supplies of farmed salmon and other factors have depressed prices of Alaska's wild salmon. Foreign-produced, farmed salmon is being substituted for wild salmon in Alaska's domestic and export markets. A recession in Japan has further contributed to a sharp drop in the prices paid by Japanese importers for sockeye salmon. Pink salmon markets have been hit hard by successive years of high harvests and declining per capita consumption of canned salmon. New product forms, increased emphasis on quality, and expanded industry-funded domestic marketing should help to stabilize salmon markets, but low prices will hurt both fishermen and processors, and could change many of the players in the industry.

Alaska's halibut and sablefish fisheries face dramatic changes with the introduction in 1995 of an Individual Fishing Quota (IFQ) management system. Fishermen's harvests of these species will be limited to the amount of quota that they hold. Initially, quota will be distributed to fishermen based on their past harvests, and it may then be bought and sold. The IFQ management system will likely lead to smaller fleets and longer seasons, changing the character of these fisheries and those who benefit from them.

The groundfish and crab industry also face dramatic management changes to address severe problems of overcapitalization which have eroded the profitability of these fisheries. The U.S. Department of Commerce has approved a moratorium on further entry of vessels into these fisheries, and is investigating methods of limiting access through limited entry or individual quotas. Limiting access will change the fleet structure, the timing of harvests, and the type of products which are produced. Debate will likely continue over the allocation of groundfish harvests which began in 1992 when federal fish managers approved a plan that allocated 35% of the groundfish to onshore processors and 65% to at-sea processors. Debate will also continue over the Community Development Quota (CDQ) program, which began in 1992 to allocate a portion of the groundfish harvest to communities in western Alaska to promote economic development and local participation in fisheries. Unless reauthorized, both the onshore/offshore and CDQ allocation programs are scheduled to sunset December 1995.



This shows the average statewide ex-vessel prices received by sockeye salmon and pink salmon fishermen. The 1993 prices are preliminary.

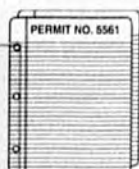
The Seafood Industry in Alaska's Economy

The seafood industry is vitally important to Alaska's economy. It is Alaska's largest private-sector employer. More than 35 thousand Alaskans work in fish harvesting or processing, accounting for one-sixth of Alaska employment and payroll. Including jobs in support sectors such as transportation, more than one-fifth of Alaska employment is attributable to the seafood industry. The seafood industry is particularly important for coastal communities, where fish harvesting and fish processing are often the only significant private-sector activities, and fisheries taxes are the most important source of local government revenues. But thousands of residents of Alaska's largest cities also fish part of the year, or work in industries which provide support services to the seafood industry.

Alaska's seafood industry pays its own way. The seafood industry contributed more than \$87 million to state revenues in FY93, including \$42 million in fisheries business taxes. State operating expenditures to support fisheries management, enforcement, and other seafood-related activities totaled \$85 million. The seafood industry is second only to the oil industry in its contributions to state government.

Number of fishing permit holders and crew, 1989

Alaska residents	35,017
Nonresidents	15,621
Total	50,638



Approximate annual average fishing employment, 1991

Salmon	7,900
Groundfish	3,000
Shellfish	2,300
Halibut	1,100
Herring	800



Seafood processing employment, 1992

Peak monthly employment (July) ..	20,431
Annual average employment	11,245



Limited entry permits held by residents, 1992

Anchorage	780
Juneau	472
Petersburg	448
Kodiak	440
Sitka	421
Homer	365
Ketchikan	358
Kenai	229
Fairbanks	110
Other Communities	3,912
Total	9,535



Landings at selected ports, 1992 (million pounds)

Dutch Harbor/Unalaska	736
Kodiak	274
Peterburg	81
Ketchikan	70
Kenai	70
Sitka	32
Cordova	30
Seward	24
Naknek	19
Homer	18



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Executive Summary

Alaska Seafood Industry

Sector Report

**Institute of Social and Economic Research
University of Alaska Anchorage**

Executive Summary

Alaska Seafood Industry

Sector Report

by
Terrence Smith

**Institute of Social and Economic Research
University of Alaska Anchorage**

June 1992

This executive summary of the Alaska seafood industry sector report was funded by the Alaska Department of Commerce and Economic Development and by the Natural Resources Fund of the University of Alaska. The Alaska Department of Fish and Game provided data and financial support for maintenance of the Alaska Fisheries Economics Database (AKFED), on which this report is based. The Division of Commercial Fisheries and the Alaska Seafood Marketing Institute guided for the printing of the document. The seafood industry sector report is one in a series of industry sector reports commissioned by the Alaska Industrial Development and Export Authority and Department of Commerce and Economic Development. Copies of the full report are available from DCED and ISER.

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Introduction

The 1980s saw rapid and remarkable change in the Alaska seafood industry. Salmon landings and revenues reached all-time highs. The crab and halibut fisheries rebounded. And in the biggest change of the decade, American fishermen and processors took over Alaska's offshore fisheries and the billions of pounds of groundfish harvests that had previously gone to foreign vessels.

As Figure 1 shows, the domestic catch of groundfish off Alaska increased from virtually nothing in 1980 to more than \$2 billion pounds by the late 1980s. This huge increase in domestic groundfish harvests meant Alaska's overall domestic seafood harvest quadrupled between 1980 and 1990.

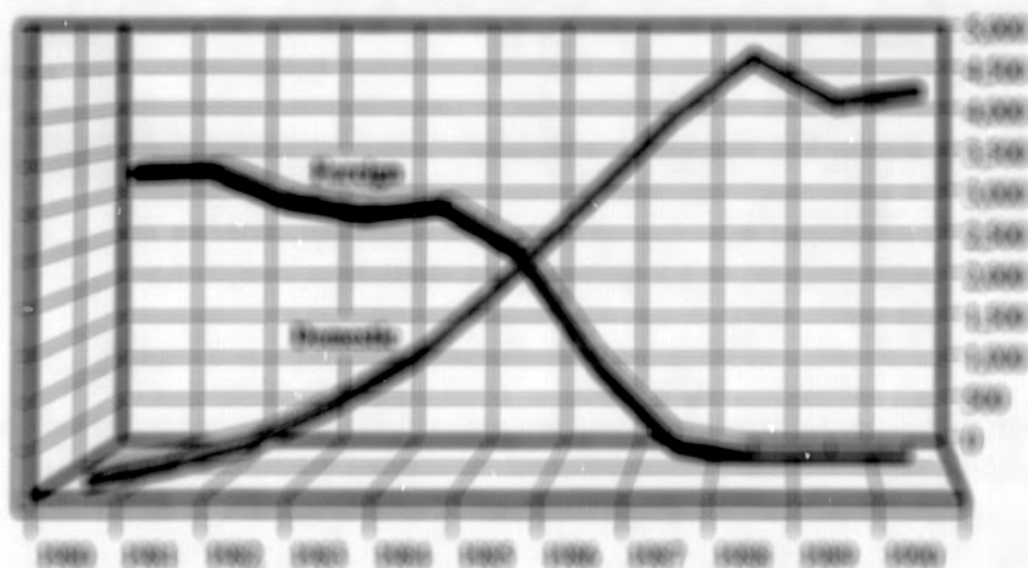
Alaska ranked among the top ten seafood producers in the world in the 1980s. Figure 2 shows Alaska harvests over the decade as compared with those of the entire U.S. and some other major fishing nations. Nearly 2 percent of world harvests, and half of U.S. harvests, came from Alaska waters in recent years.

The seafood industry has always been important to the state's economy, and in the 1980s it provided more jobs and a bigger payroll than any other resource industry. Close to one in ten Alaska adults spent at least some time commercial fishing in 1989, and throughout the 1980s Alaska residents bought about 80 percent of commercial fishing permits and around 60 percent of crew licenses for Alaska fisheries. (For brevity, throughout the publication we use "fishermen" to refer to both men and women who fish.)

Table 1 shows that the seafood industry (including both harvesting and processing) contributed 7 percent of total personal income in Alaska in 1989, and much more than that in coastal regions with the richest fisheries. And if we consider just income from Alaska's private base industries—those that drive the economy by producing goods or services for export—the seafood industry contributed more than one-quarter of Alaska's private base income in 1989, and much bigger shares in the Southwest, Gulf Coast, and Southeast regions.

Alaska's commercial fisheries stretch from the northwest peninsula along the Gulf of Alaska and the Bering Sea down to the southwest and northern coasts. Figure 3 shows location of major Alaska fisheries.

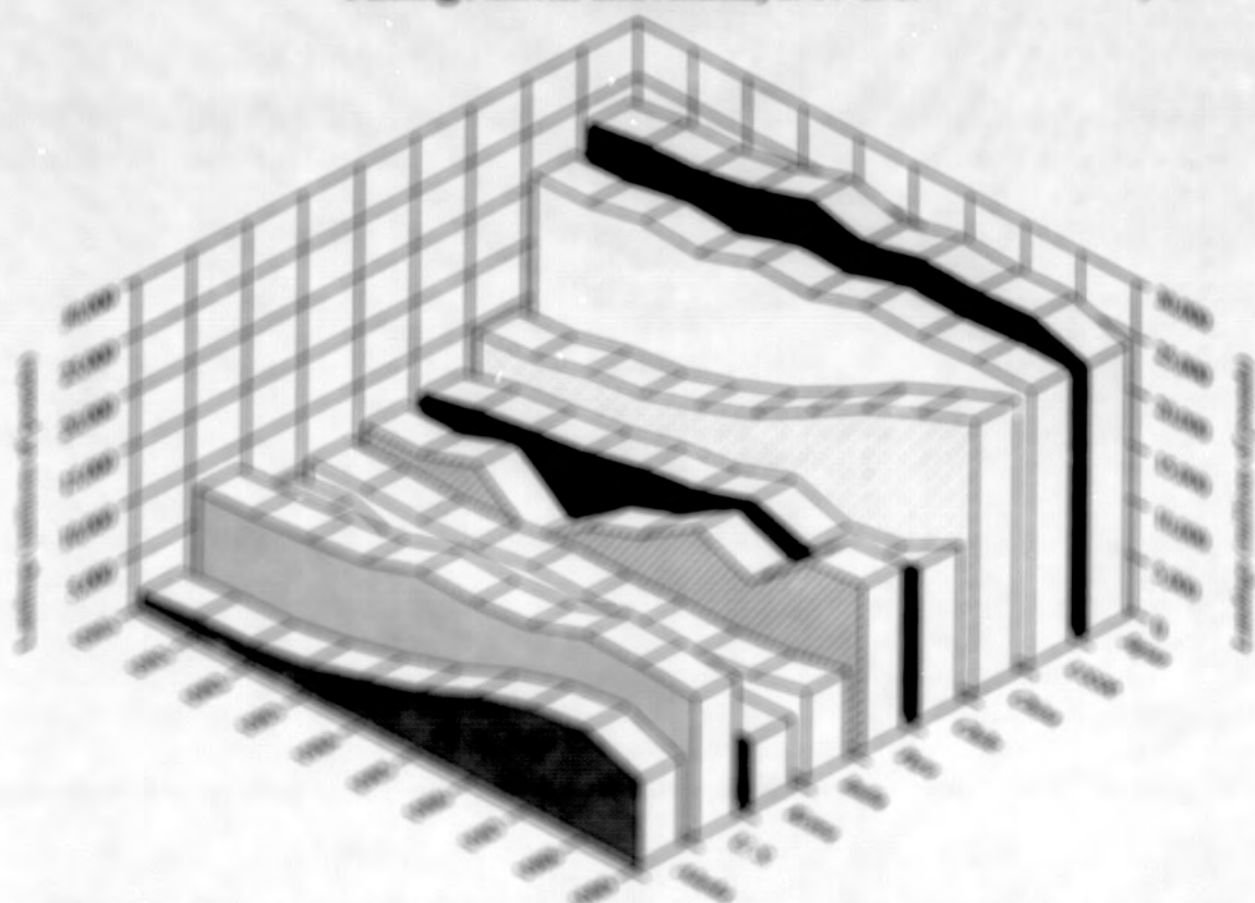
Figure 1. Domestic* and Foreign Groundfish Harvests Off Alaska, 1980-1990
(in billions of pounds)



*Domestic harvest here includes just commercial harvest; harvest built by American fishermen but processed by foreign vessels. Both just commercial catch in 1990.

Source: Alaska Fisheries Economic Statistics (1990)

Figure 2. Seafood Harvests of Selected Major Fishing Nations and Alaska, 1960-1989



Source: World Fisheries and Aquaculture Organization, *Yearbooks, National Marine Fisheries Service, Fisheries of the United States, 1990-1999*.

What we refer to broadly as the Alaska seafood "industry" is in fact a diverse collection of individuals and businesses that handle seafood products. It includes the fisherman who harvests the catch; processors and shippers who deliver a variety of processed products to the retail market; and other shippers, processors, or exporters who export the products; and ultimately, seafood markets, grocery stores, and restaurants that bring a myriad of seafood products to the consumer.

This publication examines the industry's performance over the past decade. It both updates and summarizes "The Alaska Seafood Industry: Seafood Sector Report," published in May 1991 by the Alaska Industrial Development and Export Authority (AIDEA) and the Alaska Department of Commerce and Economic Development (DECED). Both the full report and this summary are based largely on data from DECED's Alaska Fisheries Economic Database (AFEDB).

Table 1. Importance of Seafood Industry* to Alaska Personal Income, 1988

Seafood Income	Alaska/Total Alaska	Gulf Coast	Interior	Northern	Southwest Alaska	Alaska
As Percentage of Regional and National Personal Income	2	47	10	0	2	7
As Percentage of State Personal Income	9	10	10	1	2	27

*Includes harvesting and processing income. Regions are Alaska Department of Labor regions.

Source: Bureau of Labor Statistics.

Figure 3. Major Alaska Fisheries Locations



Performance of the Seafood Industry, 1980-1990

Figures 4 through 7 show how harvests, ex-vessel values, production, and wholesale values of Alaska seafood changed during the 1980s. *Harvests* are simply the total weight of seafood fishermen haul in. *Ex-vessel value* is the total money processors and others pay fishermen for unprocessed seafood. *Production* is the weight of processed seafood, and *wholesale value* is money paid to seafood processors.

Harvests and Ex-Vessel Value

Commercial fishermen use a variety of vessels and gear types to harvest Alaska seafood, and are regulated by several agencies under different management systems. The Alaska Department of Fish and Game manages the salmon, crab, and herring fisheries. The International Pacific Halibut Commission (a joint treaty organization of the U.S. and Canada) manages halibut, and the North Pacific Fishery Management Council manages groundfish off Alaska.

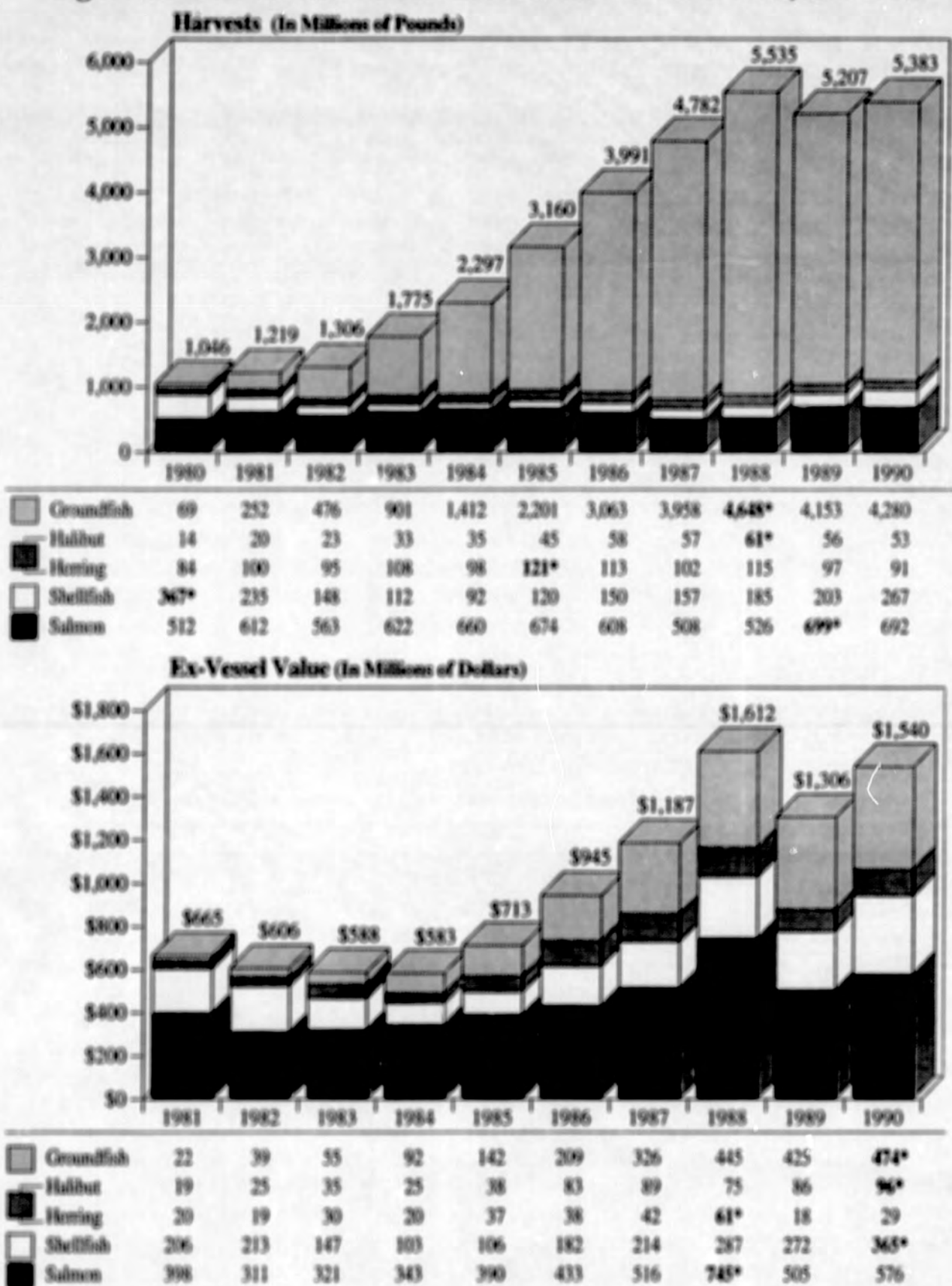
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Many kinds of groundfish are harvested in the waters off Alaska, but the most common species groups are Alaska pollock, Pacific cod, flatfish, rockfish, and sablefish. At the beginning of the decade foreign trawlers took 98 percent of the groundfish catch in Alaska's offshore fisheries. But because of the preference to domestic processors written into the federal Magnuson Fishery Conservation and Management Act of 1976, the foreign fishery was phased out. At first domestic vessels began replacing foreign trawlers and delivering to foreign processors ("joint ventures"). Finally domestic processing capacity increased to the point where U.S. processors were able to handle the entire catch. Foreign harvests off Alaska ended in 1987 and joint ventures in 1990.

Changes in the offshore fisheries and in other fisheries meant big changes in harvest and ex-vessel values in the 1980s:

- **Domestic harvests soared 500 percent between 1980 and 1990**—increasing from 1.05 billion pounds to 5.4 billion pounds. The 1990 harvest was made up of 4.3 billion pounds of groundfish, 692 million pounds of salmon, 267 million pounds of shellfish, 91 million pounds of herring, and 53 million pounds of halibut. (Figure 4.)
- **Tremendous growth in the domestic groundfish catch** accounted for most of the increase in Alaska seafood harvests. Domestic groundfish harvests increased from 69 million pounds to 4.3 billion pounds as American fishermen and processors took over the offshore fisheries. (Figure 1.)
- **Harvests of other seafood were more volatile but also trended up.** The combined catch of non-groundfish species was about 13 percent larger in 1990 than in 1980. (Figures 4 and 6.)
- **Salmon harvests generally increased**, with record landings of nearly 700 million pounds in 1989.
- **The shellfish catch peaked in 1980 at 367 million pounds**, crashed to 92 million pounds in 1984 (mostly because of a sharp drop in harvests of king crab and shrimp), and steadily recovered to 267 million pounds in 1990, largely because of growth in Tanner crab harvests.
- **Herring catches moved up and down with no apparent trend** over the decade and stood at about 91 million pounds in 1990.
- **Halibut harvests increased through 1988**, peaking at 61 million pounds. Since then halibut harvests have declined due to lower catch quotas established by the International Pacific Halibut Commission.
- **Groundfish made up nearly 80 percent of the weight of seafood harvested** in Alaska in the second half of the 1980s, with salmon making up about 15 percent, shellfish 4 percent, herring 2 percent and halibut 1 percent. (Figure 7.)
- **American fishermen were paid 230 percent more for their catches** in 1990 than in 1981—\$1.5 billion as compared with \$665 million. Ex-vessel values in 1990 were higher than in 1980 for all species groups. Values for shellfish, halibut, and groundfish reached record highs in 1990 while salmon and herring values peaked in 1988. (Figure 4.)
- **Salmon fishermen saw ex-vessel values rise 175 percent between 1980 and 1988**, then fall 32 percent between 1988 and 1989 as salmon prices plummeted. Prices continued to drop through 1991 (Knapp, 1992). The ex-vessel value recovered somewhat in 1990—not because prices went up, but because harvests of sockeye salmon increased. (Figure 4.)
- **Ups and downs marked shellfish, herring, and halibut ex-vessel values.** (Figures 4 and 6.) Halibut values went from about \$13 million in 1980 to nearly \$96 million in 1990. Herring values ranged from \$15 million in 1980 to \$61 million in 1988 with large variations from year to year. Shellfish values fell to a low of \$103 million when stocks crashed in 1984, but by 1990 had rebounded to a peak of \$365 million.
- **Salmon brought fishermen more money** than any other seafood sector in the 1980s. But as the size of the groundfish harvest grew ever larger and salmon prices dropped in the late 1980s, the ex-vessel value of groundfish moved closer to that of salmon. (Figure 4.) On average during the last half of the decade salmon made up 45 percent of value paid domestic fishermen, followed by groundfish at 27 percent, shellfish at 19 percent, halibut at 6 percent, and herring at 3 percent. (Figure 7.)

Figure 4. Alaska Domestic Seafood Harvests and Ex-Vessel Value, 1980-1990



*Peak harvest and ex-vessel value for decade.

Note: Excludes foreign groundfish harvests.

Source: Alaska Fisheries Economic Database, IFER

Production and Wholesale Value

Alaska's seafood harvests are processed into a myriad of wholesale products in a variety of ways—from simple operations such as bleeding the fish to high-technology operations that create products like surimi, a paste made from whitefish flesh. Multiple products, such as pollock fillets and fish meal, may also be produced from a single fish.

The percentage of total weight remaining after processing is known as the yield. Yields vary in different processing operations. For example, a heading and gutting operation may have a 75 to 80 percent yield, while surimi operations typically have yields in the 15 percent range.

In the groundfish and crab fisheries some processing is done offshore on vessels which also harvest (catcher/processors) or which take delivery from catcher vessels (mothership/processors). Otherwise, processing occurs at shoreside plants in Alaska, and to a certain extent, in the Pacific Northwest.

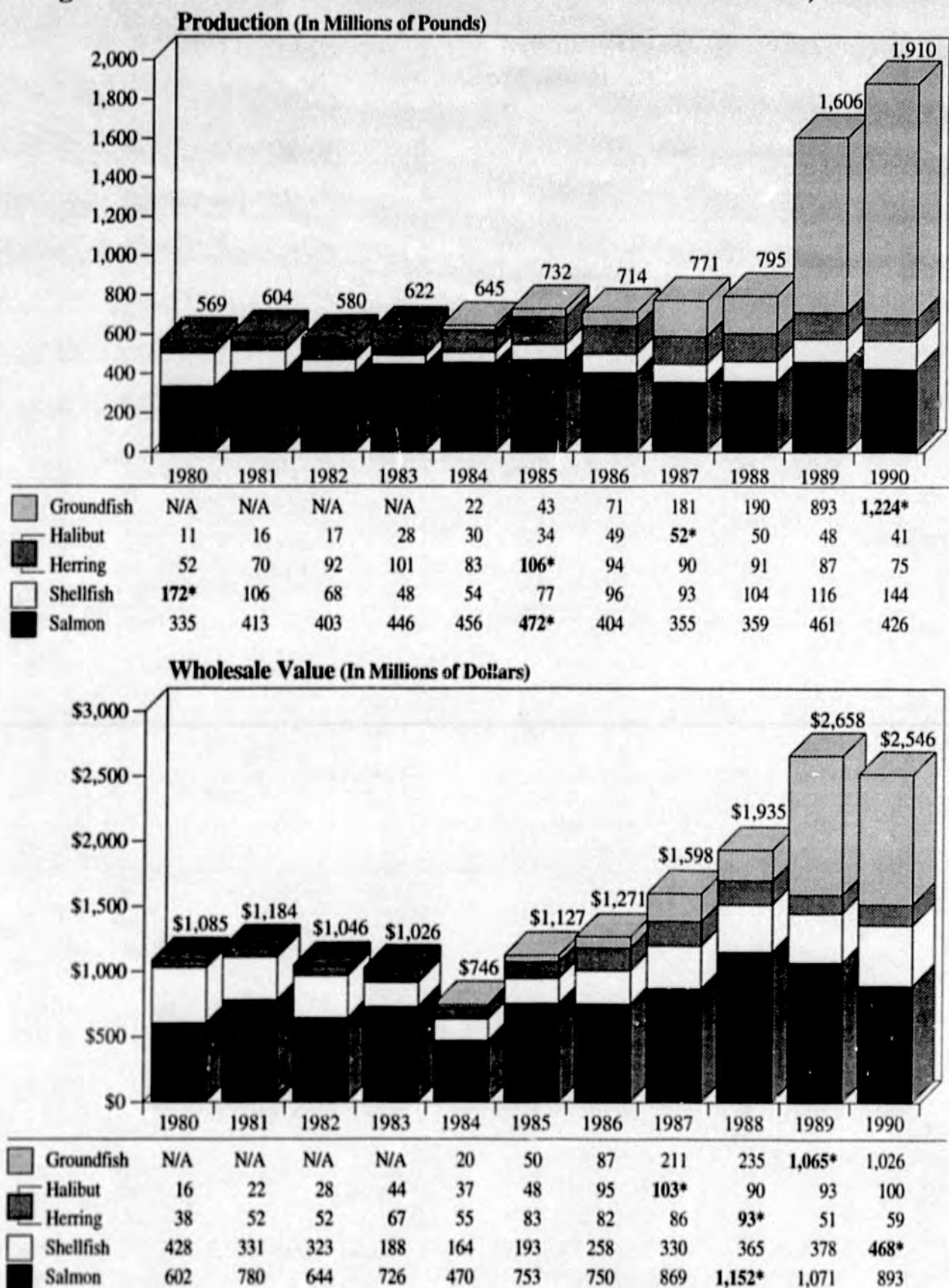
How the groundfish catch is split between offshore processors (which employ mostly non-residents) and onshore plants in Alaska (which create more local jobs) has become controversial in Alaska in recent years. The North Pacific Fishery Management Council in 1992 for the first time specifically allocated portions of future groundfish catches to onshore and offshore processors.

This summary and the full technical report represent the most comprehensive accounting to date of the Alaska seafood industry's wholesale sector. They use previously unpublished production data provided by the Alaska Commercial Fisheries Entry Commission and the National Marine Fisheries Service. Some of the reported production may have occurred at sea or at shoreside processing plants outside Alaska. However, the harvests came from Alaska waters.

Production and wholesale value of Alaska seafood changed dramatically in the 1980s:

- **Domestic production skyrocketed**, growing from about 569 million pounds in 1980 to nearly 2 billion pounds in 1990. (Figure 5.) That 1990 production was made up of 1.2 billion pounds of groundfish, 426 million pounds of salmon, 144 million pounds of shellfish, 75 million pounds of herring, and 41 million pounds of halibut.
- **Groundfish led growth in production**, increasing from about 22 million pounds in 1984 to 1.2 billion pounds in 1990—a nearly six-fold increase in six years.
- **Production from other kinds of seafood was more volatile**. (Figures 5 and 6.) Salmon production peaked in 1985 at 472 million pounds, shellfish in 1980 at 172 million pounds, herring in 1985 at 106 million pounds, and halibut in 1987 at 52 million pounds.
- **Salmon contributed the most to seafood production** in the last half of the 1980s, even though groundfish harvests were much larger. That's because a large portion of the salmon catch is exported with just minor processing, while much of the groundfish catch is used to produce relatively lower yield products (surimi, for instance). Between 1984 and 1990 salmon accounted for 42 percent of total seafood production, groundfish 37 percent, shellfish 10 percent, herring 7 percent and halibut 4 percent. (Figure 7.)
- **By 1990 groundfish overtook salmon** as the largest contributor to production. (Figure 5.) By that time groundfish harvests had grown so large that even with much lower processing yields, the resulting production outweighed salmon production. In 1990 groundfish accounted for 64 percent of total production, salmon 22 percent, shellfish 8 percent herring 4 percent, and halibut 2 percent.
- **The wholesale value of Alaska production doubled** over the decade, growing from just over \$1 billion in 1980 to more than \$2.5 billion in 1990. (Figure 5.) Leading that wholesale value in 1990 were groundfish products worth more than \$1 billion, followed by salmon products at \$893 million, shellfish products at \$468 million, herring products at \$65 million, and halibut products at \$61 million.
- **Wholesale value grew even more dramatically in the last half of the decade**. Because data on the value of groundfish production aren't available for the early 1980s, and shellfish production and value were falling at the same time, the reported total wholesale value of Alaska products bottomed out at about \$745 million in 1984. This means that in the six years from 1984 to 1990, the total wholesale value from production of Alaska seafood increased nearly 350 percent.

Figure 5. Alaska Domestic Seafood Production and Wholesale Value, 1980-1990

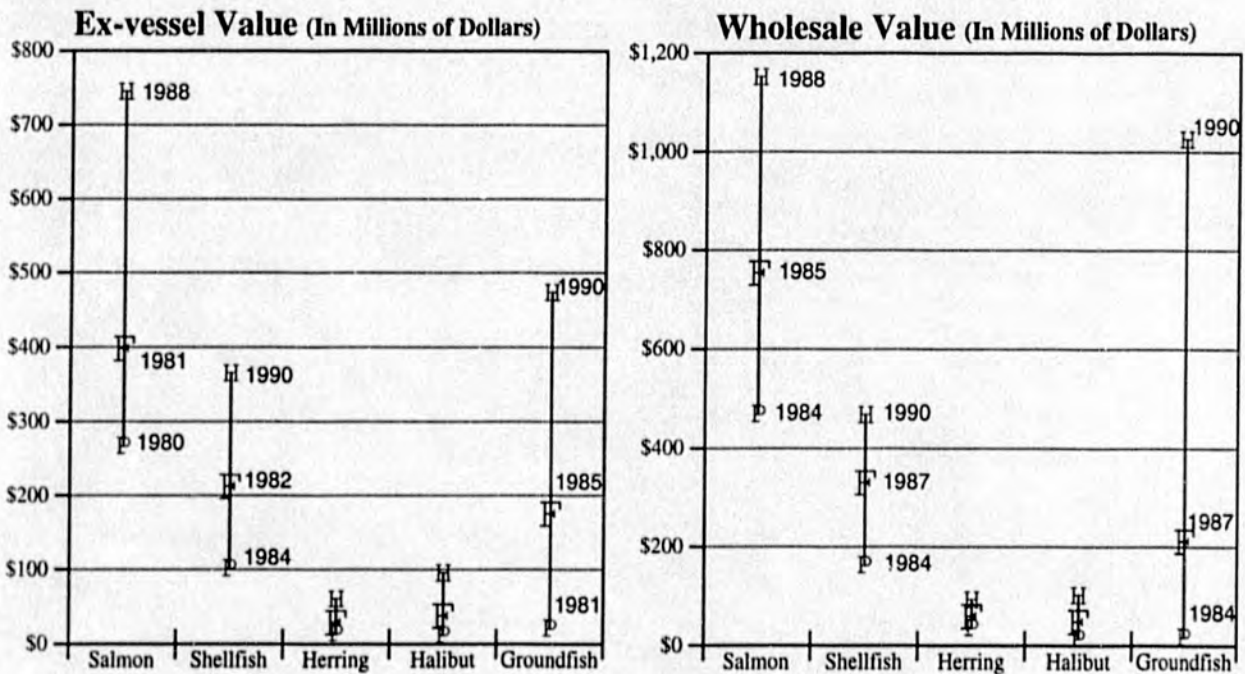
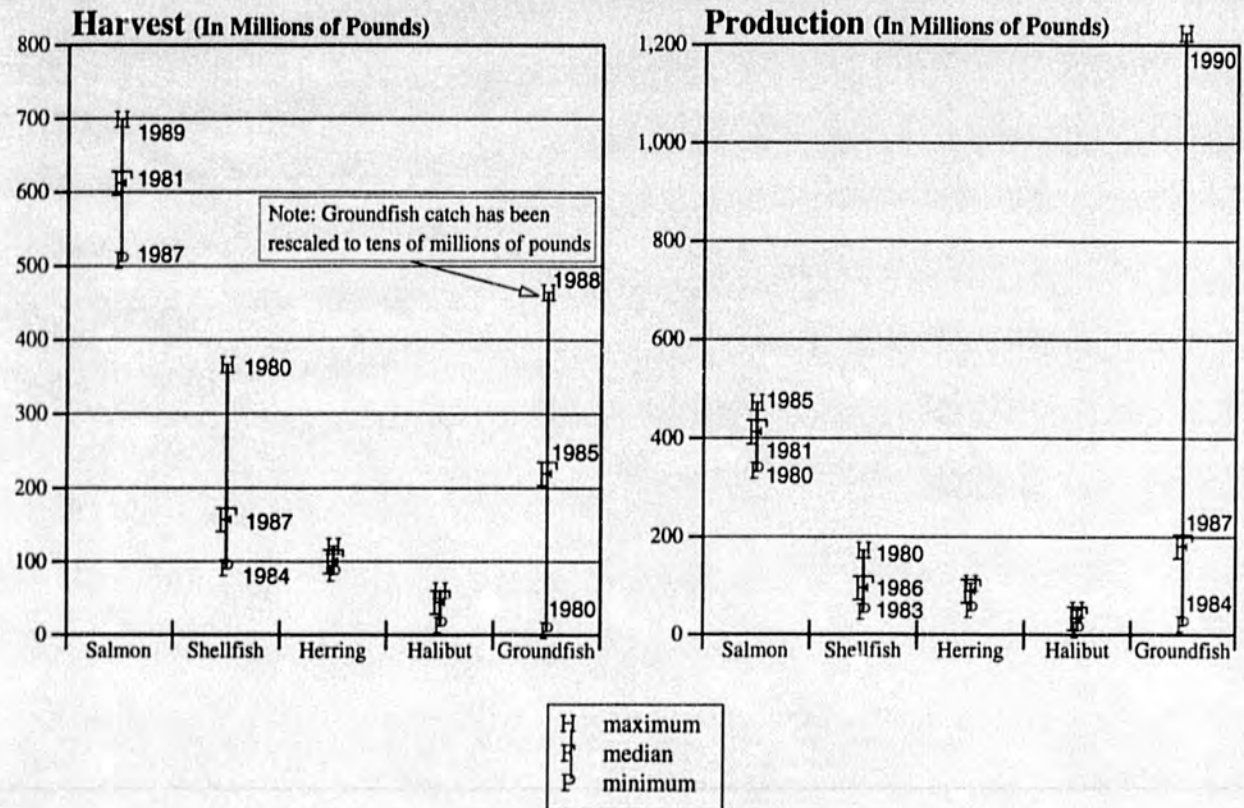


*Peak for decade.

Note: Excludes foreign groundfish production. 1989 groundfish production and wholesale value estimated using 1990 yield and price.

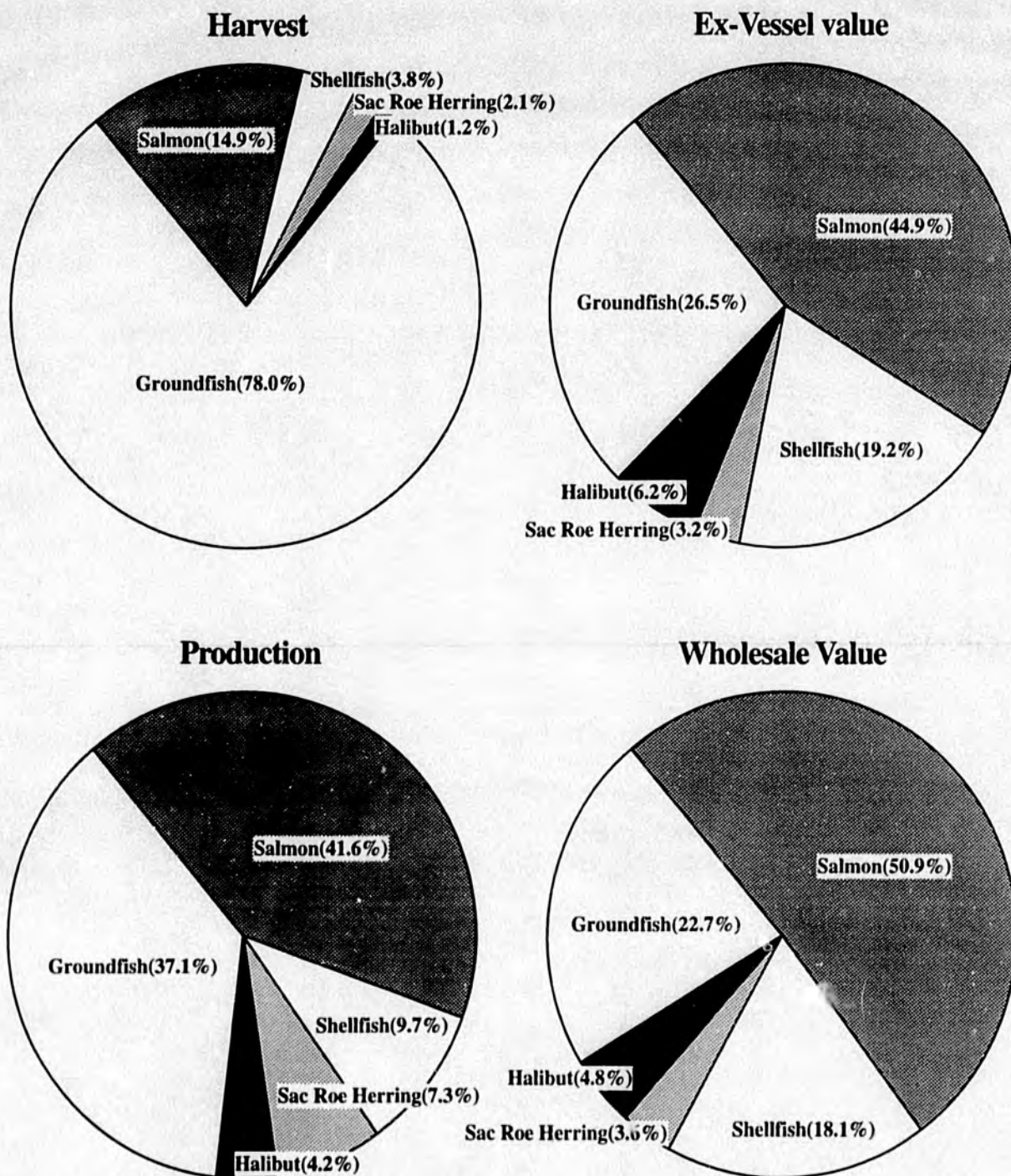
Sources: Alaska Department of Fish and Game, 1980-83, 1989-90; Commercial Fisheries Entry Commission, 1984-88; National Marine Fisheries Service, 1990.

**Figure 6. Range of Performance by Species Groups, 1980-1990
(Maximum, Median, Minimum)**



Sources: See Figures 4 and 5.

**Figure 7. Relative Contributions of Species Groups to Alaska Seafood Industry
(1984-1990 Average)**



Sources: See Figures 4 and 5.

Alaska's Role in U.S. and World Seafood Markets

Alaska's seafood harvests are far and away the largest and most valuable of any state, and they are also significant worldwide. Here are some comparisons for recent years.

- *Alaska contributed about 50 percent of total U.S. harvests* and 40 percent of total ex-vessel value throughout the 1980s.
- *The 1990 Alaska harvest was an all-time record for any state.* The 5.4 billions pounds of seafood harvested off Alaska was more than five times the 1990 harvest off Louisiana, which had the second largest harvest.
- *The 1990 ex-vessel value of Alaska seafood was five times greater* than the ex-vessel value of harvests off Massachusetts, the state ranked second in 1990 ex-vessel value.
- *Alaska's Dutch Harbor was first in U.S. landings* in 1990, and Kodiak was third. Several other Alaska communities also ranked in the top 20 for landings in 1990—Naknek (13), Cordova (14), Petersburg (16), Ketchikan (17), Egegik (19), and Seward (20).
- *Dutch Harbor was second in U.S. ex-vessel value in 1990*, after New Bedford, Massachusetts—home port to many of the George's Bank scallopers. Kodiak ranked third in ex-vessel value, Naknek fourth, Egegik sixth, and Kenai eighth.
- *Alaska pollock alone accounted for 33 percent* of the total domestic catch in 1990. Sockeye salmon and Alaska pollock were the second and third most valuable species harvested in the U.S. in 1990, just behind shrimp from the Gulf of Mexico.
- *Alaska waters provide most of the world's* harvests of sockeye salmon, Tanner crab, Pacific halibut, and sablefish. In 1987, the most recent year for which international harvest data are available, Alaska accounted for 80 percent of the world sockeye harvest, 84 percent of Tanner crab, 87 percent of Pacific halibut, and 67 percent of sablefish. Alaska harvests made up smaller but still substantial shares of the world harvests of Pacific cod (43 percent), pink salmon (34 percent), coho salmon (33 percent), dungeness crab (28 percent), and king crab (26 percent).

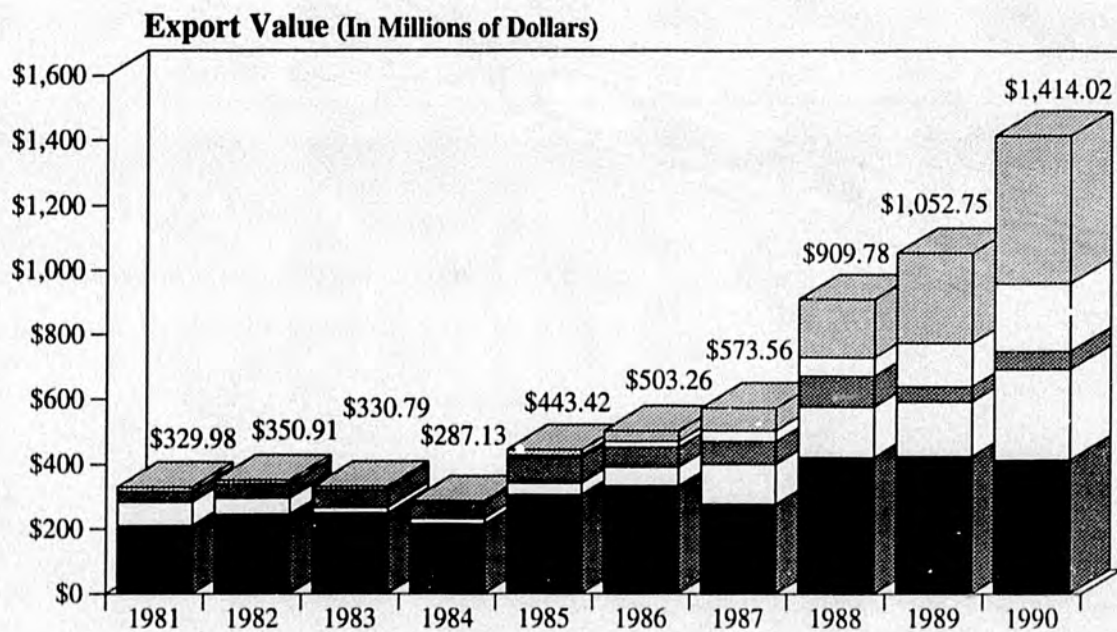
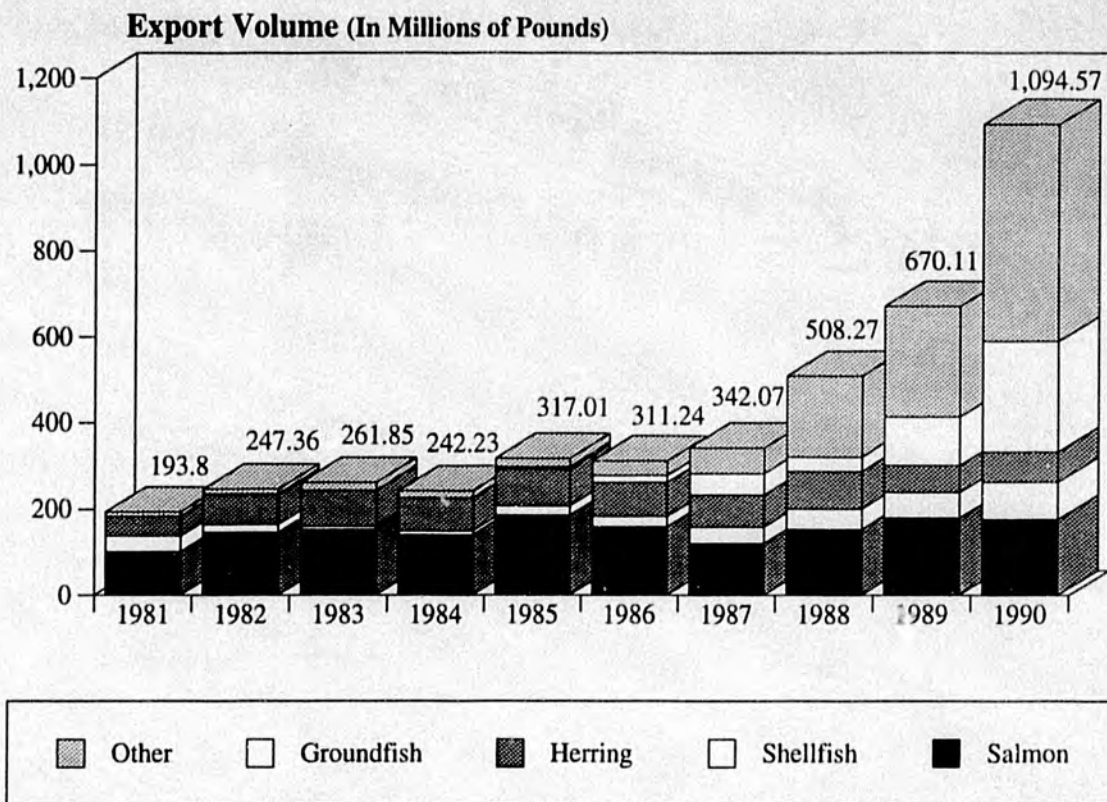
Exports of Alaska Seafood

Some of Alaska's seafood is exported directly from Alaska to other countries, some is exported indirectly (shipped first from Alaska to other states and then exported), and some is eaten in Alaska and other states.

For this study we estimated indirect exports.¹ As far as we know, no other recent studies have estimated indirect exports of Alaska fisheries production. What did Alaska exports look like in the 1980s?

- *Direct exports of Alaska seafood grew five-fold* in volume and four-fold in value over the 1980s. (Figure 8.) In 1980 direct exports totalled just under 2 million pounds worth about \$330 million. By 1990 direct exports from Alaska exceeded 1 billion pounds worth more than \$1.4 billion.
- *Salmon dominated the export statistics* both in weight and value for most of the decade, peaking at about 180 million pounds valued at \$423 million in 1989. Herring have traditionally been the second most important Alaska seafood export, but as of 1989 groundfish exports exceeded herring exports both by weight and value.
- *Salmon remained the most valuable export in 1990, followed by shellfish.* But groundfish led in weight exported. That year about 176 million pounds of salmon products valued at \$412 million were exported directly from Alaska, and 86 million pounds of shellfish valued at \$280 million. By comparison, about 255 million pounds of groundfish valued at \$210 million dollars were exported.²
- *Japan was still the largest market* for Alaska seafood exports at the end of the decade, but other countries were increasing their share. Tables 2 and 3 show that from 1988 through 1990, Japan bought more and more Alaska seafood but its overall share dropped from 95 to 87 percent. During the same period Korea and several European countries sharply increased their purchases of Alaska seafoods.

Figure 8. Direct Alaska Seafood Exports, 1981-1990



Sources: 1981-87: U.S. Department of Commerce, Bureau of the Census, Export Tapes; 1988-90: National Marine Fisheries Service, Alaska Fishery Science Center.

**Table 2. Direct Seafood Exports from Alaska
By Country of Destination, 1988-1990**
(In Thousands of Pounds and Dollars)

	1988		1989		1990	
	Pounds	Value	Pounds	Value	Pounds	Value
Japan	473,873	\$865,372	591,910	\$975,742	870,186	\$1,227,253
Korea	18,464	\$24,014	40,473	\$44,893	103,618	\$80,906
Germany	148	\$231	249	\$274	51,922	\$44,764
Norway	-	-	2,525	\$1,386	40,373	\$28,907
Portugal	6,822	\$8,929	12,522	\$13,224	16,288	\$18,629
Canada	5,472	\$6,273	20,368	\$18,816	4,568	\$7,461
United Kingdom	-	-	-	-	2,063	\$1,709
Taiwan	2,065	\$2,838	1,928	\$1,193	1,835	\$1,146
Spain	-	-	-	-	967	\$854
France	-	\$423	6	\$71	943	\$940
Thailand	1,169	\$1,542	-	-	453	\$672
All Other Countries	69	\$157	125	\$154	551	\$779
Total	508,265	\$909,799	670,105	\$1,055,752	1,093,769	\$1,414,020

Source: National Marine Fisheries Service, Fisheries of the United States.

- **Most Alaska herring was exported directly** from Alaska in the 1980s. (Table 4.)
- **Roughly a third of processed salmon was exported directly** and another third indirectly over the decade.
- **Almost no processed halibut and little king crab was exported directly** from Alaska in the 1980s, but about one-quarter of halibut and one-sixth of king crab were exported indirectly.
- **About 18 percent of processed groundfish was exported directly** and another 55 percent exported indirectly from Alaska in the last half of the 1980s.
- **Total direct and indirect exports in the 1980s** included about 60 percent of salmon products, 80 percent of herring, 25 percent of king crab and halibut, and 73 percent of groundfish.
- **Markets for Alaska seafood include Asia, Europe, and Australia.** Japan buys most exports of fresh and frozen salmon, herring, and crab. The United Kingdom, Canada, and Australia provide the biggest markets for canned salmon. Historically, most groundfish from Alaska waters and other areas of the North Pacific was processed as surimi and exported to Japan. But recently U.S. and European markets for Alaska groundfish blocks and fillets have developed.

Table 3. Top Importers of Alaska Seafood
(In Percentage of Direct Export Value)

	1988	1989	1990
Japan	95%	92%	87%
Korea	3	4	6
Portugal	1	1	1
Germany	-	-	3
Norway	-	-	2
Canada	<1	2	<1

Source: See Table 2.

**Table 4. Estimated Alaska Seafood
Exports in the 1980s***
(In Percentage of Alaska Production)

	Direct	Indirect	Total Exports
Salmon	31%	30%	61%
King Crab	14%	14%	28%
Herring	77%	2%	79%
Halibut	0%	25%	25%
Groundfish	18%	55%	73%

*Salmon and herring, 1980-88 average; king crab and halibut, 1984-87 average; groundfish, 1984-90 average.

Source: ISER calculations, based on fisheries statistics sources.

Public Revenues and Expenditures

Alaska's fish are public resources. Fish within 3 miles offshore are managed by the State of Alaska. Fish within the federal Exclusive Economic Zone, from 3 to 200 miles offshore, are managed by the federal government under the Magnuson Fishery Conservation and Management Act.

In return for their use of the resource, fishermen and processors pay various taxes and fees at the local, state, and federal levels. They also benefit from government expenditures for services such as research, management, and enforcement.

Taxes and Fees

- **The fishing industry paid** about \$52 million in major taxes and fees in fiscal year 1989, the most recent year for which figures are available. In 1980 taxes and fees totalled about \$21.5 million.
- **The biggest source of revenue** is the Fisheries Business Tax (also called the raw fish tax), which brought the state government \$27 million in fiscal 1989.³ The state refunds 50 percent of that tax to the communities and boroughs where it is collected. Other state taxes include the Salmon Enhancement Tax, used to help pay costs of hatchery operations; and the Seafood Marketing Assessment, which funds the Alaska Seafood Marketing Institute. The state government also collected about \$5.1 million from licenses and permits in fiscal 1989.
- **The federal Marine Fuel Tax** netted the government \$7.2 million in 1989, but that figure includes not only taxes paid by commercial fishing vessels but also marine transportation and recreational vessels. The fishing industry also paid \$6.8 million in fiscal 1991 for the observers the federal government requires on vessels in the groundfish fisheries.
- **Cities received \$8.1 million and boroughs \$7.6 million** in shared state fisheries business taxes in fiscal 1989. Shared revenues to cities were up from \$4.7 million in fiscal 1987, and to boroughs up from \$3.9 million.

Expenditures

- **The federal government spent \$4.2 million** in managing fisheries in the Alaska region in fiscal 1989.
- **The Alaska Department of Fish and Game spent about \$49.5 million** managing the commercial fisheries in fiscal 1989. (We reached that estimate by applying the same percentage of commercial management expenses to total ADFG expenses calculated by Kruse [1988] for fiscal 1987.)
- **Together the federal and state governments spent about \$54 million** managing Alaska's fisheries in fiscal 1989 and collected about \$42 million, if we net out revenues that went to salmon aquaculture associations. To give us some perspective on those revenues and expenditures, the total ex-vessel value of the fisheries off Alaska for 1989 was \$1.3 billion and the wholesale value of seafood products was \$2.7 billion.

Table 5. Fisheries Taxes and Fees, FY85-FY89
(In Thousands of Dollars)

	1985	1986	1987	1988	1989
Marine Fuel Tax	\$4,298	\$5,290	\$5,373	\$5,294	\$7,208
Licenses and Permits	4,847	5,073	4,939	5,821	5,162
Seafood Marketing Tax	964	1,122	1,460	2,670	3,349
Salmon Enhancement Tax	2,625	4,263	4,444	5,769	9,544
Fisheries Business Tax	18,663	21,105	26,605	22,523	26,690
TOTAL MAJOR SOURCES	\$31,397	\$36,853	\$42,821	\$42,077	\$51,953

Notes: Marine fuel tax includes taxes paid by vessels other than commercial fishing vessels, such as marine transportation and sport fishing vessels.

Sources: Original data from Kruse, 1987. Updated using data provided by Bob Elliot, Alaska Department of Revenue, May 1990.

The Seafood Industry in Alaska's Economy

The seafood industry has historically been an important part of Alaska's economy. In several regions of the state it provides most of the private economic base. It generates jobs and income in a number of ways—through fishing itself; through seafood processing; through other sectors that supply goods and services to fishermen and processors; and through fishermen, processors, and others spending their money in the local economy. Adding all those sources of jobs and income together shows the overall economic contributions of the seafood industry.

Table 6 gives us an idea of participation in commercial fishing itself in the 1980s, by showing the number of fishing permits and crew licenses purchased annually. (Bear in mind that a single person may hold several fisheries permits.) The number of permits sold fluctuated around 18,000, and the number of crew licenses sold varied from 24,000 to 35,000. Alaska residents bought most of those permits and licenses, but non-residents bought about 20 percent of permits and 35 percent of crew licenses. The largest numbers of fishermen were in the salmon fisheries and in the Southeast, Southcentral, and Bristol Bay regions.

Fisheries jobs are mainly seasonal, and economists commonly assess the economic effects of fishing jobs by calculating how the large number of seasonal jobs would translate into the equivalent of year-round jobs. The most recent available estimates of average annual employment in fishing were done by McDowell (1989) for 1986, and are shown in Figure 9. McDowell's estimates are generally higher than those from previous studies, in part because they include not only time fishermen actually spent fishing but also time they spent before and after the fishing season in preparation, maintenance, and other work related to fishing. The figure shows there were the equivalent of about 10,600 year-round jobs in fishing in 1986, and that most of them were in the salmon fisheries.

Jobs and wages in seafood processing are also important parts of seafood's overall contribution to Alaska's economy. Table 7 shows how average annual employment and annual wages in processing looked in the 1980s. Average annual employment (excluding the groundfish fisheries) varied from about 5,600 to 8,400, and annual wages from \$104 million to \$163 million. Data on employment and wages in the rapidly expanding offshore

Table 6. Estimated Harvesting Participation

PERMIT HOLDERS AND CREW MEMBERS
(RANGE, 1980-1989)

	Numbers	Percentage Alaska Resident
Permits Purchased	17,340-19,598	78% - 82%
Crew Licenses Purchased	24,228-35,207	63% - 67%
TOTAL	43,826-53,508	69% - 72%

NUMBERS OF PERMITS AND CREW LICENSES BY REGION AND BY FISHERY, 1986

	Salmon	Shellfish	Herring	Halibut	Percentage Participation by Region [†]
Southeast	6,069	617	651	2,601	22%
Southcentral	4,730	460	1,261	3,366	21
Kodiak	1,564	306	392	3,468	12
Aleutians	1,916	2,411	258	765	12
Bristol Bay	7,193	-	2,200	-	20
Northwest	3,777	-	2,082	-	13
TOTAL PARTICIPATION	25,249	3,794	6,844	10,200	
Percentage Participation [†] by Fishery	55%	8	15	22	

[†] Totals and percentage participation apply to total permits and licenses, not numbers of fishermen, since one person may hold multiple permits.

Sources: Kruse, 1988; Helgath and Rainery, 1987; McDowell, 1989.

groundfish fisheries are limited. Available estimates of processing and harvesting workers combined put total employment in the groundfish fisheries at anywhere from 3,000 to 5,400 in the late 1980s. (McDowell 1989; Coopers and Lybrand 1990; Northern Economics 1990.)

If we add together the jobs and income from fishing itself, from processing, and from all the other activities generated by fishing and processing, we get a total picture of seafood's contribution to the Alaska economy. Two estimates of the seafood industry's economic contributions were done in the 1980s. Berman and Hull (1987) estimated total income generated by the industry in 1984. McDowell (1989) estimated jobs and payroll the industry contributed in 1987. In the 1980s the seafood industry made valuable contributions to Alaska's economy:

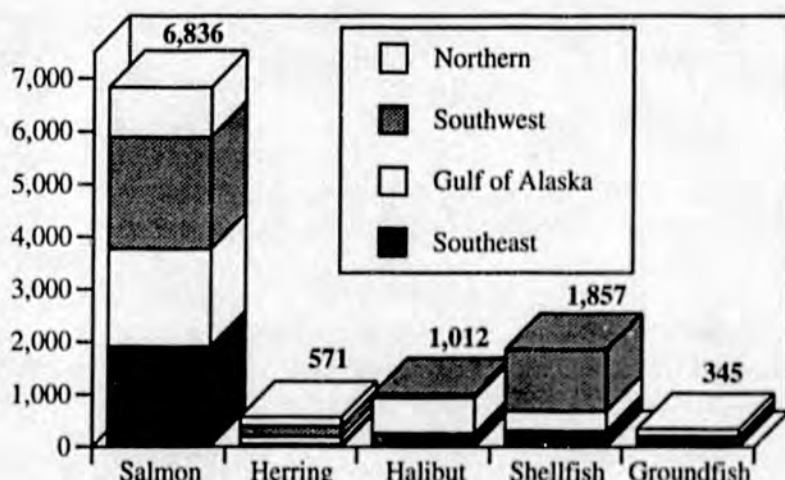
- **Total income attributable to the seafood industry in 1984 was \$583 million.** (Figure 10.) Alaskans earned \$431 million, or nearly 75 percent, of that total. The Southwest region accounted for about 42 percent of all seafood income, followed by the Gulf of Alaska region (25 percent), the Southeast (17 percent) and the Anchorage/Matanuska-Susitna region (13 percent). The Northern and Interior regions accounted for the remaining 3 percent.
- **Roughly 33,000 to 38,000 Alaska jobs were attributable to the seafood industry** in 1987 (McDowell 1989). Looked at another way, harvesting and processing jobs accounted for roughly 50 to 60 percent of total jobs generated by the seafood industry, while the industry generated the other 40 percent or so of jobs in less direct ways.
- **About 7 percent of all personal income in Alaska** in 1984 was contributed by the seafood industry. (Table 1.)
- **About 27 percent of private basic income** in Alaska in 1984 was generated by the seafood industry. Basic industries are those that drive the economy by producing goods or services for export. Alaska's private basic industries include the seafood, petroleum, mining, forest products, and tourism industries. The federal government is also considered a basic industry, but it is not a *private* basic industry.
- **The economies of several regions depend heavily** on the seafood industry. In 1984 the southwest region's seafood industry generated 47 percent of total personal income and 98 percent of private basic income. The industry provided 19 percent of total income and 44 percent of private basic income in the Gulf of Alaska region, and 10 percent of total and 40 percent of private basic income in the southeast region.

**Table 7. Processing Employment and Wages
Range 1980-1988**

Average Annual Employment	5,650-8,388
Annual Wages	\$104 million-\$163 million

Source: Alaska Department of Labor

**Figure 9. Estimated Annual Average Harvesting Jobs,*
By Species Group and Region, 1986**



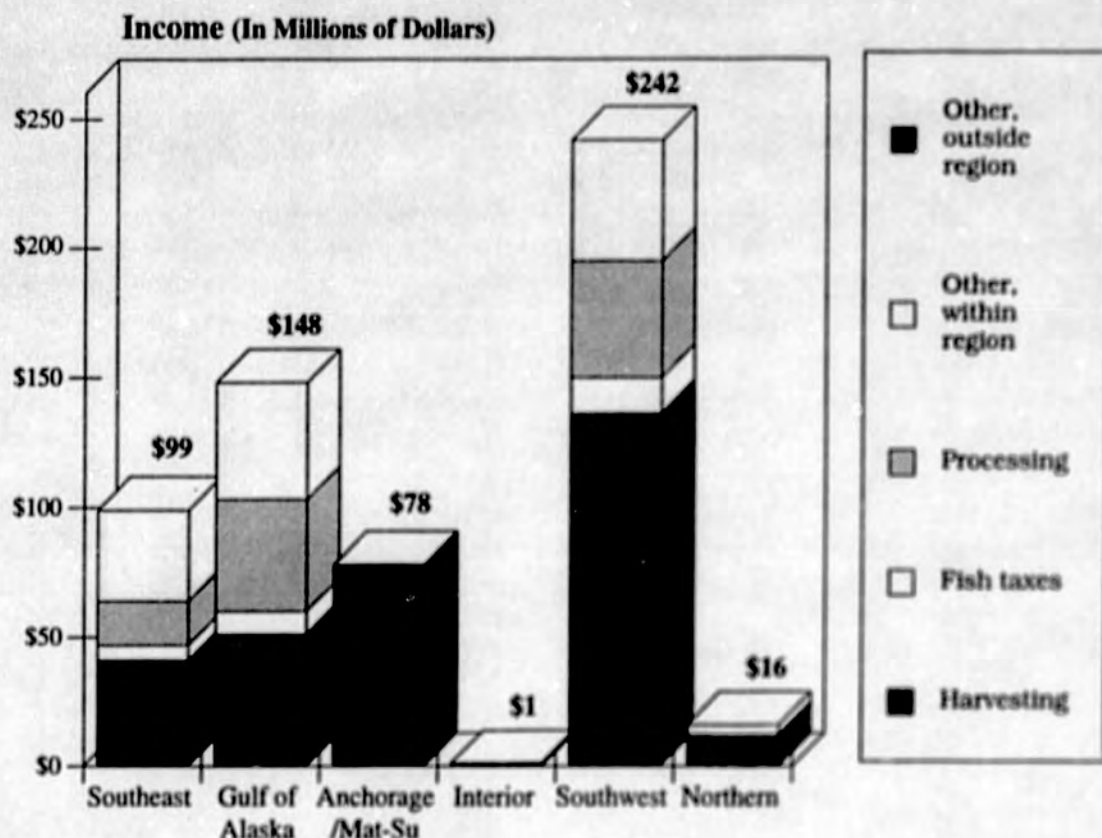
*Based on time spent in fishing-related activities before and after the fishing season as well as actual fishing time.

Source: McDowell et al., 1989.

• **The seafood industry had more workers and a bigger payroll** than any other private basic industry in 1987. Including both the fishing and processing sectors, it accounted for 23 percent of total basic industry employment and 24 percent of basic industry payroll. (Figure 11.) Only the federal government employed more people and had a bigger payroll, and among private basic industries only oil and gas came close to matching seafood's payroll. However, the oil and gas industry didn't employ nearly as many people.

• **Most private employment in Kodiak, the Aleutians, and Bristol Bay** in 1987 was in the seafood industry, and that industry was the largest private employer in the southeast and northwest.

Figure 10. Total Income in the Alaska Seafood Industry By Region, 1984



Source: Berman and Hull, 1987.

The Alaska Seafood Industry in the 1990s

Profound and lasting changes in the harvesting, processing, and marketing sectors will likely transform the Alaska seafood industry in the 1990s.

Already at the end of the 1980s growing supplies of farmed salmon and other factors depressed prices for Alaska's wild salmon. Although 1992 prices may rebound slightly (Knapp 1992), long-term prospects are for increased substitution of foreign produced farmed salmon for wild salmon in Alaska's export markets. Fishermen will therefore be squeezed between higher costs and weakening prices.

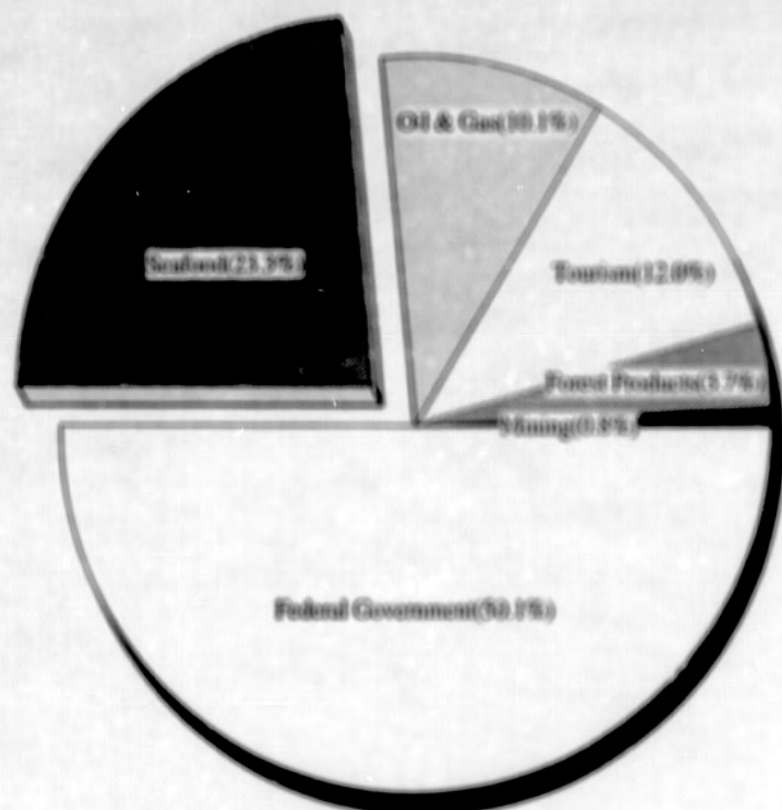
The groundfish fishery is also undergoing significant restructuring. First, the North Pacific Fishery Management Council recently approved, for the first time, a formal allocation of groundfish harvests between inshore and offshore processors. In the short run, this proposed allocation implies displacement of the large offshore fleet and expansion of shoreside processing capacity. In the longer run, overcapitalization of both types of processing and local preemption issues will force further division of the catch quotas by season and area.

Second, the council has approved a share quota limited access system for sablefish and halibut, and is considering a moratorium on further entry into the groundfish and crab fisheries and limited access systems for these fisheries. Privatizing the fisheries will result in a fleet structure considerably different from the current structure, and limited access systems will change the timing and type of production.

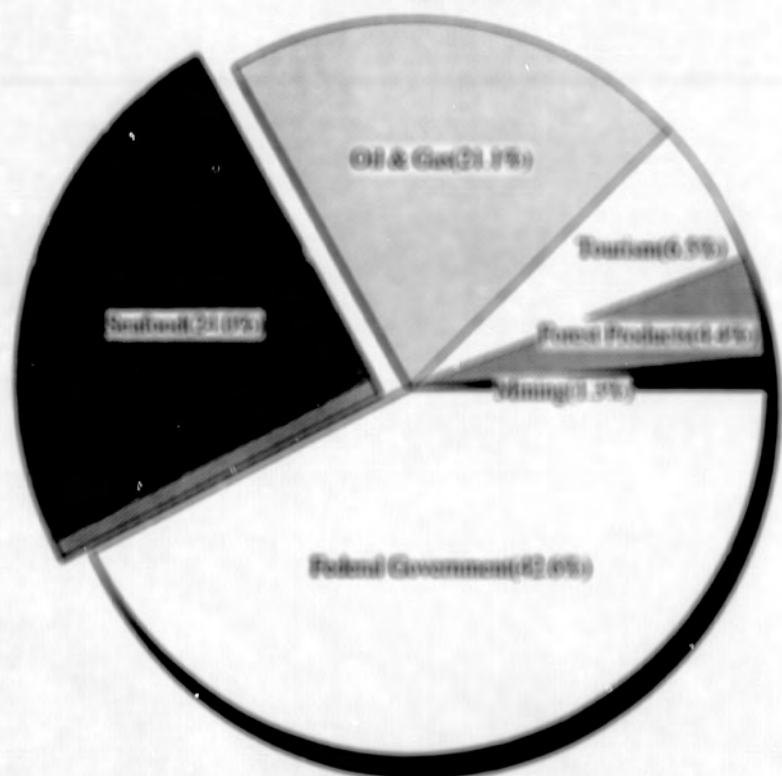
Included under both inshore versus offshore allocation and individual quota systems are programs that will allocate a share of the groundfish resource to Alaska coastal communities. Since these quotas may be fished, leased, or sold, substantial changes in who benefits from groundfish harvesting and processing can be expected.

In sum, Alaska seems likely to retain a prominent role in U.S. and world fisheries, but the complexion of the industry will be very different in the year 2000 from what it is today.

Figure 11. The Role of the Seafood Sector in Alaska's Basic Industries, 1987



Total Employment



Total Payroll

**Includes industries that produce goods or services for export. Excludes state and local government, and portions of support, service, and infrastructure industries.*

Source: McDowell et al., 1989.

Endnotes

1. Information on direct exports is available from the U.S. Department of Commerce, Bureau of the Census. We estimate indirect exports by assuming that for each species the share of the total Alaska exports (direct and indirect) in Alaska production is the same as the share of total U.S. exports in total U.S. production. We then estimate indirect exports as the difference between total Alaska exports and direct exports. Domestic consumption is estimated as the difference between total Alaska production and estimated total exports.
2. The precise distribution of 1990 exports is uncertain, because the data sources allocate 45 percent of exports to the category of "other fish." If the "other fish" category were more accurately allocated, substantial shares would shift to other specific categories.
3. Liability under the Fisheries Business Tax can be reduced by the Fisheries Business Education Credit which allows a fisheries business to credit up to 50 percent of cash contributions for direct instruction, research, and educational support purposes made to two- or four-year colleges and universities in Alaska. Until the end of 1990 liability could also be reduced through the Fisheries Business Tax Credit which allowed processors: a credit of up to 50 percent of their annual Fisheries Business Tax liability for approved capital expenditures that (1) increased product diversity, production efficiency or capacity, or product quality at a shore-based fisheries business facility in Alaska, or (2) contributed to the development of a cooperative seafood industrial park in Alaska.

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8

How "blackbox" is the state's seafood industry?

Of the 12,000 holders of commercial fishing permits, more than three quarters are Alaska residents (77%). More than half (50%) of all commercial fisheries are also held by Alaskans and roughly half (47%) of all processing facilities are Alaskan.

9

How can the economic impacts of the industry be measured?

Fishing permits themselves are to be tracked through subsequent changes such as sales prices, quality, and "blackboxization" of fisheries work as well as processing. Substantial and varied benefits will also come by increasing the sustainability of fisheries, monitoring and fish products, and utilizing fish by products more fully.

10

How can I get more information on commercial fisheries management in Alaska?

Contact:
Commercial Fisheries Management
and Development Division
Alaska Department of
Fish and Game
P.O. Box 110000, Anchorage, Alaska 99511
(907) 269-2111

Design and production by
State Communications Service
Alaska Department of Fish and Game
Anchorage, Alaska



Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
P.O. Box 110000, Anchorage, Alaska 99511
(907) 269-2111

Seafood: Alaska's First Permanent Fund



Alaska Department of Fish and Game
Division of Commercial Fisheries
Management and Development

Fish were Alaska's first permanent fund. This fund has a well-diversified portfolio including salmon, herring, halibut, crab, shrimp, clams, groundfish, and a variety of other fish species yet to be fully tapped.

Alaskans have been living off the annual production or "interest" of this fund for years. The salmon component alone has provided commercial harvesters with annual distributions that during the past 100 years totaled more than 6 billion fish, enough for every man, woman and child on earth to have one.

This brochure provides answers to 10 of the most commonly asked questions about Alaska's most productive renewable resource.

1 How many jobs does the seafood industry provide?

The Alaska seafood industry provides more jobs and a bigger payroll than any other resource industry in the state. Over the course of a year, the industry employs more than 70,000 people. This translates into more than 22,000 full-time jobs. Only the oil and gas industry comes close to matching the payroll of the seafood industry among private basic industries.

2 How much seafood does Alaska produce?

Domestic harvests of seafood in Alaska soared 500% between 1980 and 1990, increasing from 1 to 5.4 billion pounds. The 1990 harvest was made up of 4.3 billion pounds of groundfish, 692 million pounds of salmon, 267 million pounds of shellfish, 91 million pounds of herring, and 53 million pounds of halibut.

3 How much is this seafood worth?

The amount fishers were paid for their harvests increased from \$665 million in 1981 to \$1.6 billion in 1992. The wholesale value of the harvest also doubled over the same period to more than \$2.8 billion in 1992. This is greater than the entire state operating budget.

4 In addition to jobs and food, what other public benefits does the industry provide?

The fishing industry paid about \$64 million in major taxes and fees in fiscal year 1993. The Fisheries Business Tax alone brought state government \$43 million in fiscal year 1993. Of this, cities and boroughs received \$21 million.

5 What does it cost to manage Alaska's commercial fisheries?

The state spent about \$85 million to manage Alaska's commercial fisheries in fiscal year 1993. These expenditures were offset by about \$88 million in revenues for a net revenue gain of about \$3 million. The cost of management is a mere 3% of the wholesale value of Alaska's seafood products. Seafood harvests produce a big bang for every buck spent.

6 In terms of state spending alone, what percentage of the budget goes to commercial fisheries management?

In fiscal year 1993, the state's General Fund budget was \$2.8 billion. During the same year, commercial fisheries management cost \$57 million in general funds, about 2%.

7 How does Alaska rank as a seafood producer?

Alaska is one of the top ten seafood harvesters in the world, along with Japan, Russia, China, Peru, and others. Nationally, Alaska supplies roughly 54% of the total U.S. seafood harvest and more than 90% of the Pacific salmon harvested.

Is it expensive?

Without a doubt projects, such as the statewide survey, that provide information needed for good fisheries management cost money. Nevertheless, considering the great value of Alaska's sport fisheries in providing both recreation and a stable source of jobs and income, cost-effective projects such as the survey are sound investments for the future.

How can anglers help?

The Statewide Harvest Survey won't work without continued angler participation. Survey questionnaires are mailed to a representative sample of Alaska sport fishing license holders. To obtain a true picture of sport fishing in Alaska, information is needed from all types of anglers.

Completed surveys are needed from individuals who bought a license and didn't get a chance to fish, from those who fished just once or twice and weren't very successful, and from those anglers who seem able to catch fish on every cast. Anglers who receive a survey should take a few minutes to complete it. This extra effort by those selected to participate will be appreciated by today's anglers and those yet to experience Alaska sport fishing.



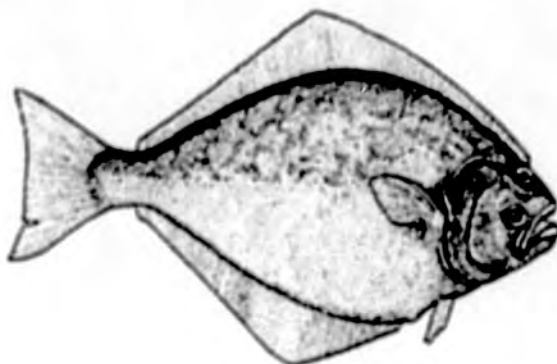
For more information contact:

Alaska Department of Fish and Game
Division of Sport Fish
Research and Technical Services Section
333 Raspberry Road
Anchorage, AK 99518-1599
(907) 267-2369



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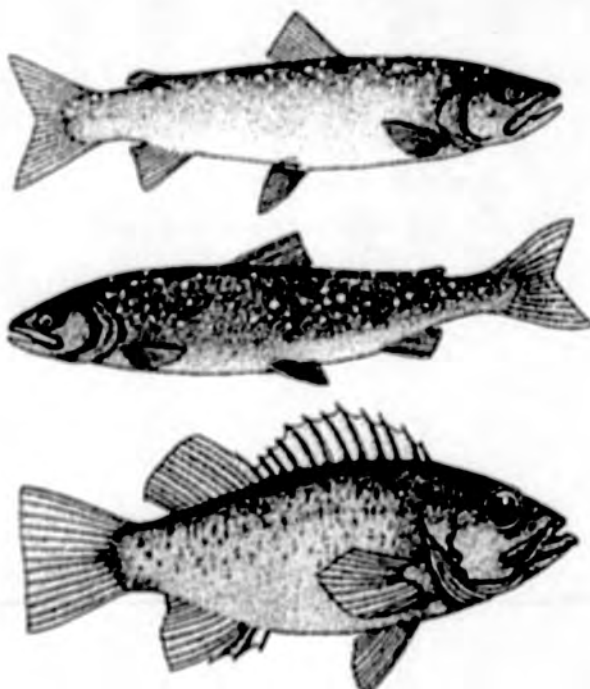
OEO
U.S. Department of the Interior
Washington, D.C. 20240



October 1992

The Statewide Sport Fish Harvest Survey:

*A way for anglers to participate in decisions
concerning Alaska's sport fisheries.*



Alaska Department
of
Fish and Game

*Division of Sport Fish
Research and Technical Services Section
Anchorage, Alaska*

What is the Statewide Sport Fish Harvest Survey?

The Statewide Sport Fish Harvest Survey is a method used by the Sport Fish Division of the Alaska Department of Fish and Game to inexpensively obtain information on sport fishing participation, catch, and harvest (fish kept) in Alaska. Each year questionnaires are mailed to a sample of individuals licensed to sport fish in the state. The information resulting from anglers' responses is used to manage Alaska's diverse and increasingly popular sport fisheries.

Why use this method?

The other means available to obtain this information on sport fishing is the creel survey, which involves contacting anglers at the fishing site. Interviewers ask anglers how long they fished, what they caught, and what they kept. This approach provides information for fisheries in which decisions must be made during the season, but is too expensive to conduct for every important Alaska sport fishery.

How does it work?

Mail questionnaires.

The survey is based on mailing questionnaires to a representative sample of approximately 30,000 Alaska sport fishing license holders.

Although individual license holders are selected to receive a questionnaire, they are requested to provide a record of their entire household's sport fishing. This approach provides data for both licensed anglers and unlicensed anglers, such as those under 16 years of age. Questionnaire recipients are asked the number of anglers, days fished, and number of trips for each location fished, as well as the number of fish caught and kept by species.



Reminders.

Individuals who do not return the initial questionnaire are mailed a reminder letter and a replacement questionnaire. If a response is not received after the first reminder, a second reminder and a questionnaire are mailed. This approach increases the available data and promotes response that is representative of all angler households that fished in Alaska.

Response.

Thanks to the willingness of anglers to spend a few minutes to carefully complete and return the questionnaire, this method has proved successful in meeting information needs for many of Alaska's sport fisheries. Of the surveys delivered to angler households, over 55% are completed and returned. This is a good response rate for surveys of this type.

How good is the information?

The quality of the information resulting from the survey is primarily dependent on the number of anglers who respond and on the completeness and accuracy of their responses.

Error detection procedures.

Most anglers respond fully. Responses for specific fishing sites are properly recorded and reported harvests are reasonable for the sites fished. These responses require no editing.

Unintentional errors or unreasonable responses are detected by a series of computer editing programs, which speed processing, maintain data consistency, and improve accuracy.

Number of responses.

In general, the quality of the survey information improves as the number of responses increases. Information for the entire state, for regions, and for large fisheries is considered good. For some small fisheries for which response is low, information is used with caution.

Comparison with other information.

Specific on-site creel surveys described earlier provide a basis for comparison with the statewide survey. The two methods have provided statistically similar information.

How is the information used?

Evaluation, conservation, regulation, assessment.

Information from the survey is used to identify the need to study fish populations, to improve fisheries, and to establish regulations. Information is also used to evaluate the impacts of projects and regulations. For example, survey information might be used to detect: increased fishing effort following access development or improvement, increased catch at a stocked location, decreased catch for a depressed fish population, or changes in effort and success in response to regulations that alter bag limits, fishing methods, or seasons.

Planning and policy making.

Fishery managers and policy makers examine several years of survey information to spot trends. This helps them understand the history and direction of Alaska's sport fisheries so that they can develop and refine programs to address future needs. They also use the information to assess the benefits and impacts of their decisions. Individuals and the sport fishing industry use the information to assess demand for and economic viability of businesses, such as tackle shops, fishing lodges, and guiding services.



Subsistence In Alaska: 1994 Update

Division of Subsistence, Alaska Department of Fish and Game
Box 25526, Juneau, Alaska, 99802 (907) 465-4147
March 1, 1994

Introduction

Subsistence fishing and hunting are important for the economies and cultures of many families and communities in Alaska. This report provides an update on subsistence in Alaska, including participants, harvest levels, and current legal issues.

What is Subsistence?

State and federal laws define subsistence as the "customary and traditional" uses of wild resources, for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. Customary and traditional uses of fish and game are important to Alaskans from diverse cultural backgrounds, including Aleut, Athabaskan, Alutiiq, Euroamerican, Haida, Inupiat, Tlingit, Tsimshian, and Yup'ik. Harvesting, sharing, and using fish and wildlife are integral to the customs and traditions of a variety of cultural groups.

Subsistence uses also are important for Alaska's economy. Many Alaskan communities depend upon mixed, subsistence-cash economies, where subsistence production

is a major economic sector. The household economies of many families are dependent upon food and raw materials from subsistence activities.

State and federal subsistence statutes recognize the importance of customary and traditional subsistence uses of wild resources. Subsistence uses are given a preference over commercial fishing and recreational fishing and hunting in state and federal law.

Who Participates in Subsistence Uses?

State and federal laws differ in who qualifies for subsistence uses. Currently, all state residents qualify for subsistence fishing and hunting under state law. In 1990, there were 550,043 people living in Alaska (Fig. 1).

Under federal law, rural residents (about 21% of the population 1990) qualify for subsistence fishing and hunting on federal lands in Alaska. Of the 116,653 rural residents 55,888 were Alaska Natives (48%) and 60,765 were not Alaska Native (52%), while of the 433,390 urban residents, 29,810 were Alaska Natives (16%) and 403,580 were not Alaska Natives (84%).

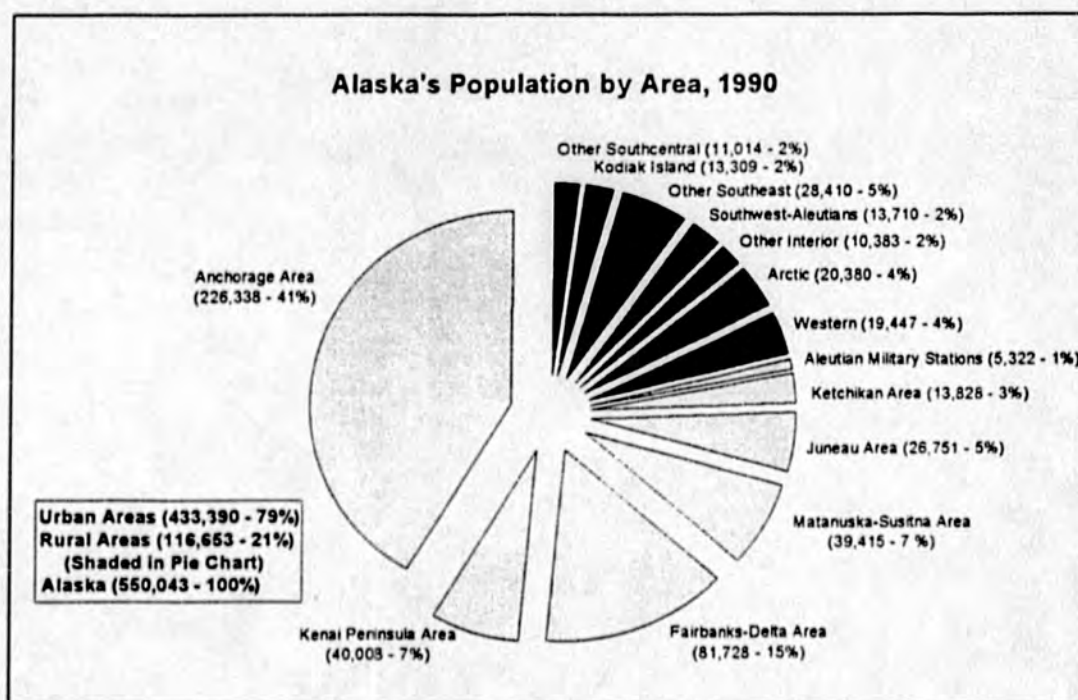


Figure 1

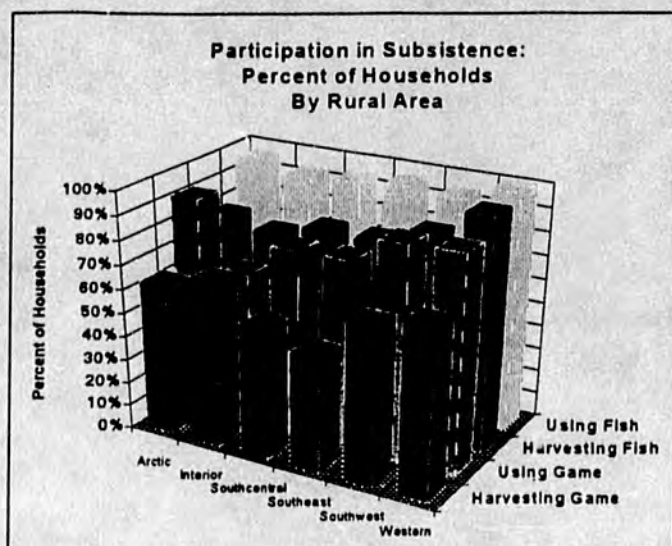


Figure 2

A substantial proportion of rural households harvest and use wild foods (Fig. 2). For surveyed communities in different rural regions, from 92%-100% of sampled households used fish, 75%-98% used wildlife, 75%-98% harvested fish, and 48%-70% harvested wildlife. Because subsistence foods are widely shared, most residents in rural communities make use of subsistence foods during the course of the year to some extent. A substantial number of urban residents engage in hunting and fishing also, as shown by the number of licenses sold in 1991: Anchorage-Matanuska-Susitna Area (32,428; 12 percent of all residents), Fairbanks Area (11,059; 14 percent), Kenai Peninsula Area (8,282; 20 percent), Ketchikan (2,648; 19 percent) and Juneau (3,683; 14 percent).

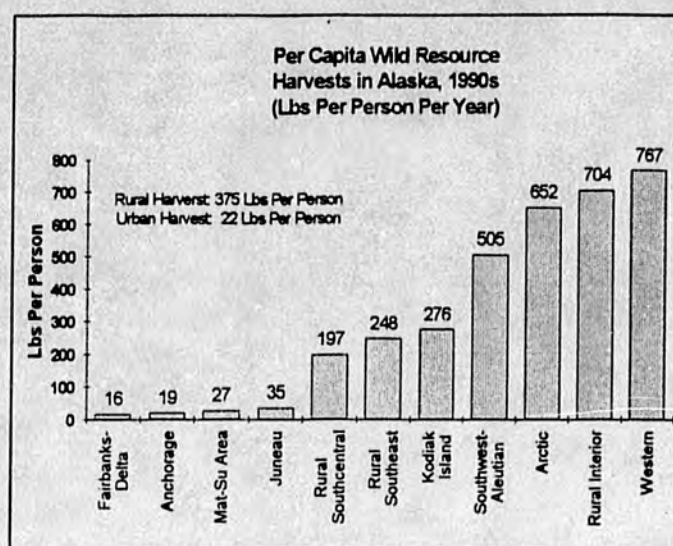


Figure 4

Wild Food Harvests in Alaska

Subsistence fishing and hunting provides a major part of the food supply of rural Alaska (Fig. 3). Our best estimate is that about 43.7 million lbs (usable weight) of wild foods are harvested annually by residents of rural areas of the state, and 9.8 million lbs by urban residents.

On a per person basis, the annual wild food harvest is about 375 lbs per person per year for rural areas (about a pound a day per person), and 22 lbs per person for urban areas (Fig. 4). Harvests vary substantially by area, with the greatest average regional harvests (about 500-800 lbs per person) in communities off the state's road system.

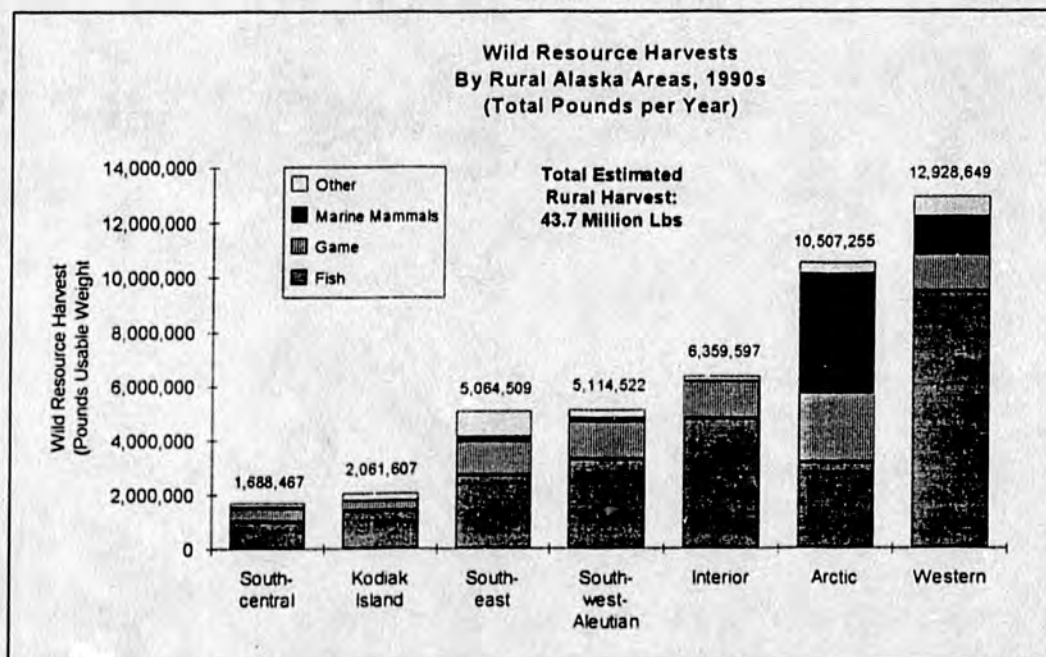


Figure 3

The composition of the wild food harvest by rural residents is about 59% fish, 20% land mammals, 14% marine mammals, 2% shellfish, 2% birds, and 2% plants (Fig. 5). The harvest by urban residents is 68% fish, 30% land mammals, 1% birds, and 1% shellfish and plants.

The Nutritional Value of Subsistence Harvests

The subsistence food harvest provides a major part of the nutritional requirements of Alaska's population.

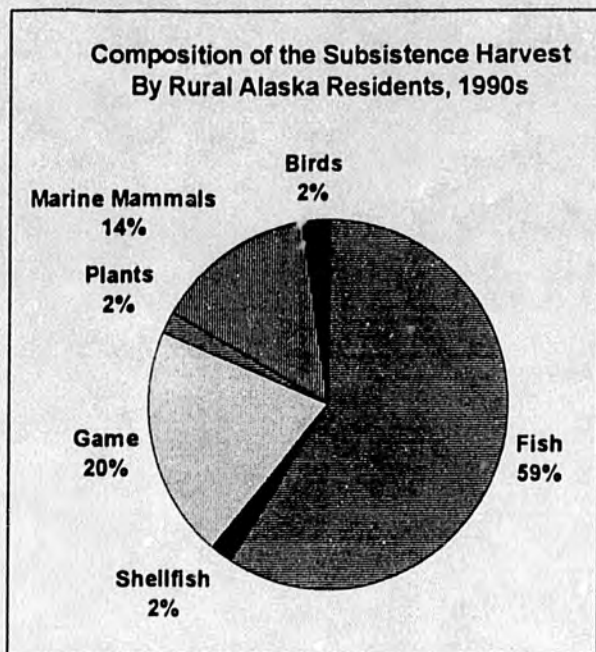


Figure 5

The annual rural harvest of 375 lbs per person contains 243% of the protein requirements of the rural population (that is, it can supply about 107 grams of protein per person per day; about 44 grams is the mean daily requirement). The subsistence harvest contains 35% of the caloric requirements of the rural population (that is, it contains about 840 Kcal daily, assuming a 2,400

Kcal/day mean daily requirement). The urban wild food harvests contain 15% of the protein requirements and 2% of the caloric requirements of the urban population.

The Monetary Value of Subsistence Harvests

Subsistence fishing and hunting are important to the local economies of many areas in Alaska. Attaching a dollar value to subsistence uses is difficult, as subsistence products generally do not circulate in markets. However, if families did not have subsistence foods, substitutes would have to be imported and purchased, which would require larger cash incomes. If one assumes a replacement expense of \$3-\$5 per pound, the simple "replacement costs" of the wild food harvests in rural Alaska may be estimated at \$131.1-\$218.6 million dollars annually (Fig. 6).

The monetary value of subsistence harvests is substantial when compared with cash incomes of families in many rural areas. For instance, the per capita cash value of subsistence foods in the rural interior (\$3,063 per person) compares with a per capita income of only \$6,205 for Native families -- the cost of replacing subsistence foods would be 49% of mean incomes in that case. Similarly, subsistence replacement costs represent 59% of Native family income in the western region, 31% of Native family income in the arctic region, and 22% of Native family income for all rural Alaska. The replacement value of wild

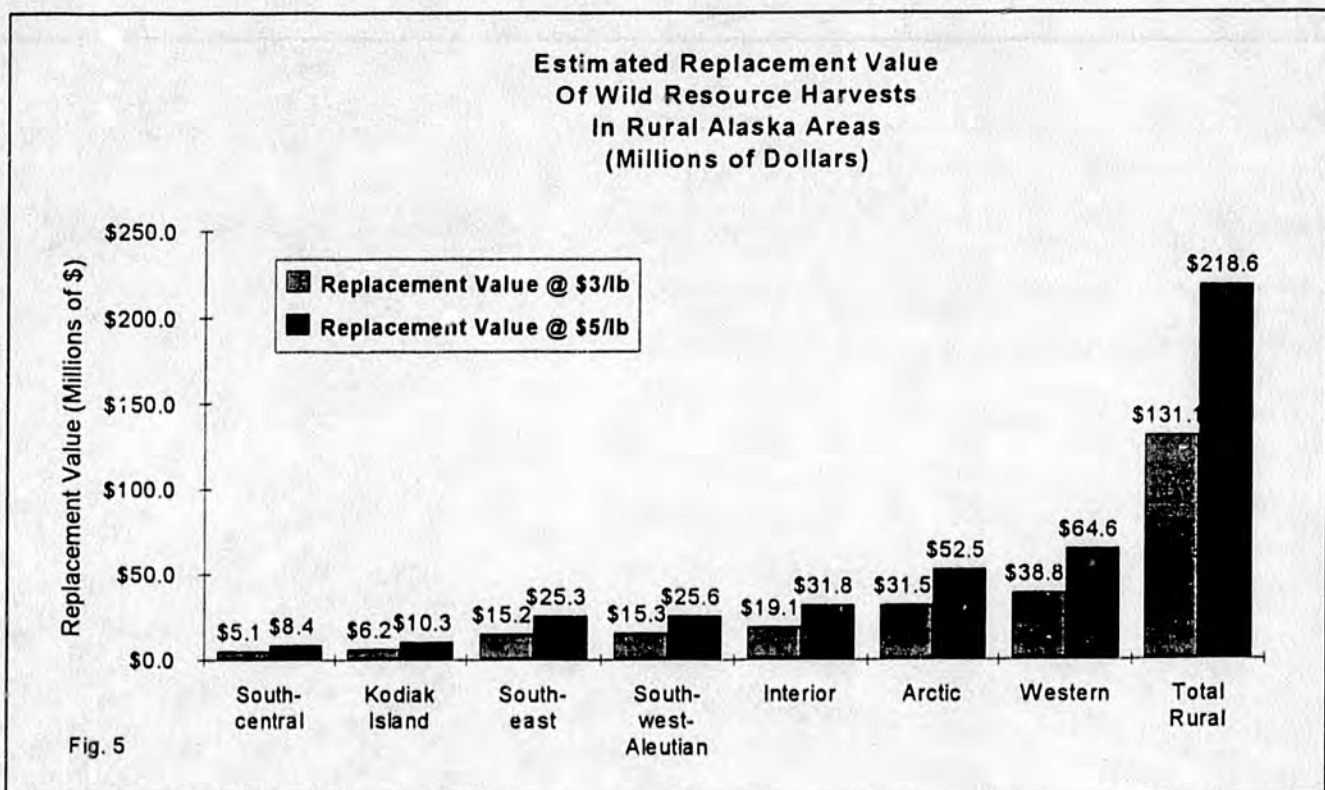


Figure 6

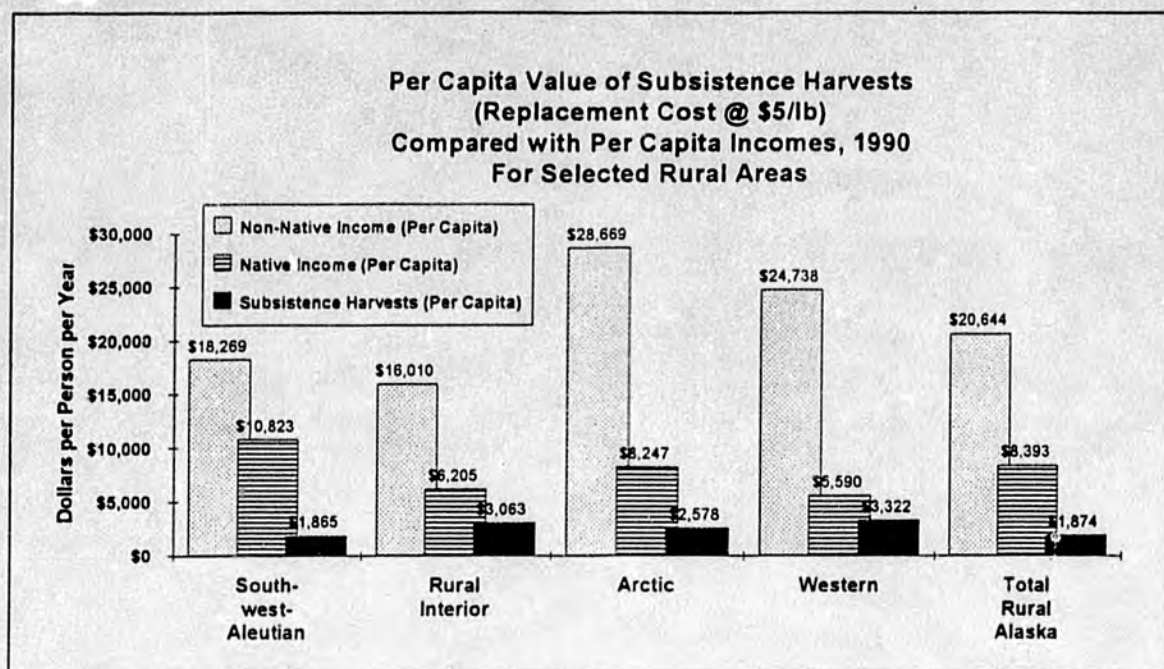


Figure 7

foods represents about 10% of the average rural non-Native income (Fig. 7). Clearly, many families would have difficulty paying cash for foods to replace the subsistence harvest

Real Employment

Subsistence harvesting, processing, and non-market distribution employ large numbers of rural residents annually. While wage paying jobs are commonly few and insecure in rural areas, work in fishing, hunting, and processing wild foods employs people consistently from one year to the next. For instance, in Ft. Yukon along the Yukon River in 1987, 82% of households hunted, and 65% fished. The subsistence take was about 680 lbs per person. These activities employed more people than the single largest wage employer in Ft. Yukon (local government), which employed persons from 40% of the community's households that year.

Subsistence activities are organized locally and draw upon local knowledge and skills. Subsistence is an area of life where extended families can support themselves in meaningful, productive work.

Legal Framework for Subsistence Management

Subsistence management has undergone considerable change since 1989, when state law fell out of compliance with federal requirements. In 1994, subsistence hunting and fishing was being managed under two separate legal frameworks. The Alaska Boards of Fisheries and Game

developed subsistence regulations for state and private lands and navigable waters, for which all state residents qualified. A Federal Subsistence Board developed subsistence regulations for federal public lands and waters, for which rural residents qualified. In addition, the federal National Marine Fisheries Service and Fish and Wildlife Service regulated marine mammal hunting under the Marine Mammal Protection Act, for which Alaska Natives qualified.

State and federal governments agree that split federal-state management of fish and wildlife is undesirable. However, the way to regain unified state subsistence management authority is uncertain at this time. It is expected that the federal subsistence management program may continue to grow over the next few years, and that jurisdictions and authorities will ultimately be clarified through administrative and judicial activity.

Summary

Subsistence continues to be an important part of the diverse cultures and regional economies in Alaska. Subsistence fishing and hunting produce a substantial portion of the state's food supply, particularly in rural areas. Subsistence provides a measure of economic stability in areas with mixed, subsistence-cash economic systems. And subsistence expresses customary and traditional values and ways of living that are important to Alaska's diverse cultural groups.

Prepared by Robert J. Wolfe and Robert G. Bosworth

SALMON FISHERIES

State-Management

Salmon -- Sockeye, Pink, Chum, Coho, Chinook

Joint State/Federal Management

Southeast Alaska Troll Fishery, Chinook and Coho

Federal Management

None

MANAGEMENT STRATEGY

Time/Area Closure

Escapement Enumeration -----> Escapement Goal

Escapement Enumeration

Tower counts, sonar counts, weir counts, aerial survey counts, foot survey

Fishery Monitoring

Processor reports, catch records (fish tickets), catch stock identification

Escapement Goals

Expand fishing opportunities to increase harvests during strong runs and reducing fishing by time/area closures to reduce harvests during weak runs.

MAJOR ISSUES

1. Depressed Stocks and Limited Escapement Enumeration

e.g., AYK chum salmon, Prince William Sound pink salmon, Establish biological escapement goals and escapement enumeration programs to stocks and areas where currently not available.

2. Allocation of catches and burden of conservation in mixed stock fisheries.

e.g., Yukon River, Alaska Peninsula, Cook Inlet, Kodiak

3. Update and Improve Sonar Technology.

Replace outdated equipment, improve and develop AYK sonar projects.

4. Bycatch in Groundfish Fisheries

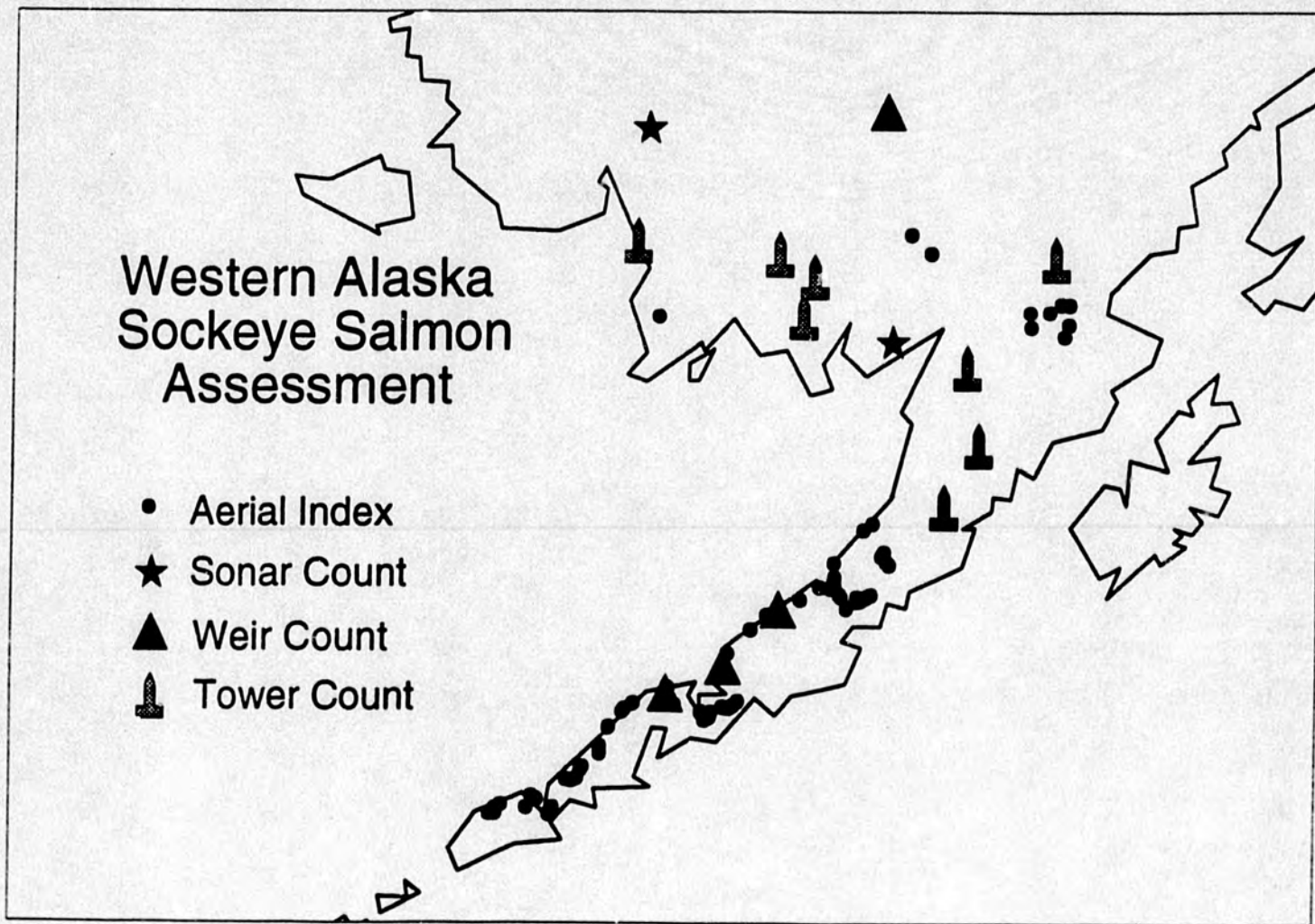
Limits on incidental take of king and chum salmon in groundfish trawl fisheries

5. Threats of Federal Management Incursion

Potential for salmon stocks listing under ESA to preempt traditional Alaskan fisheries.

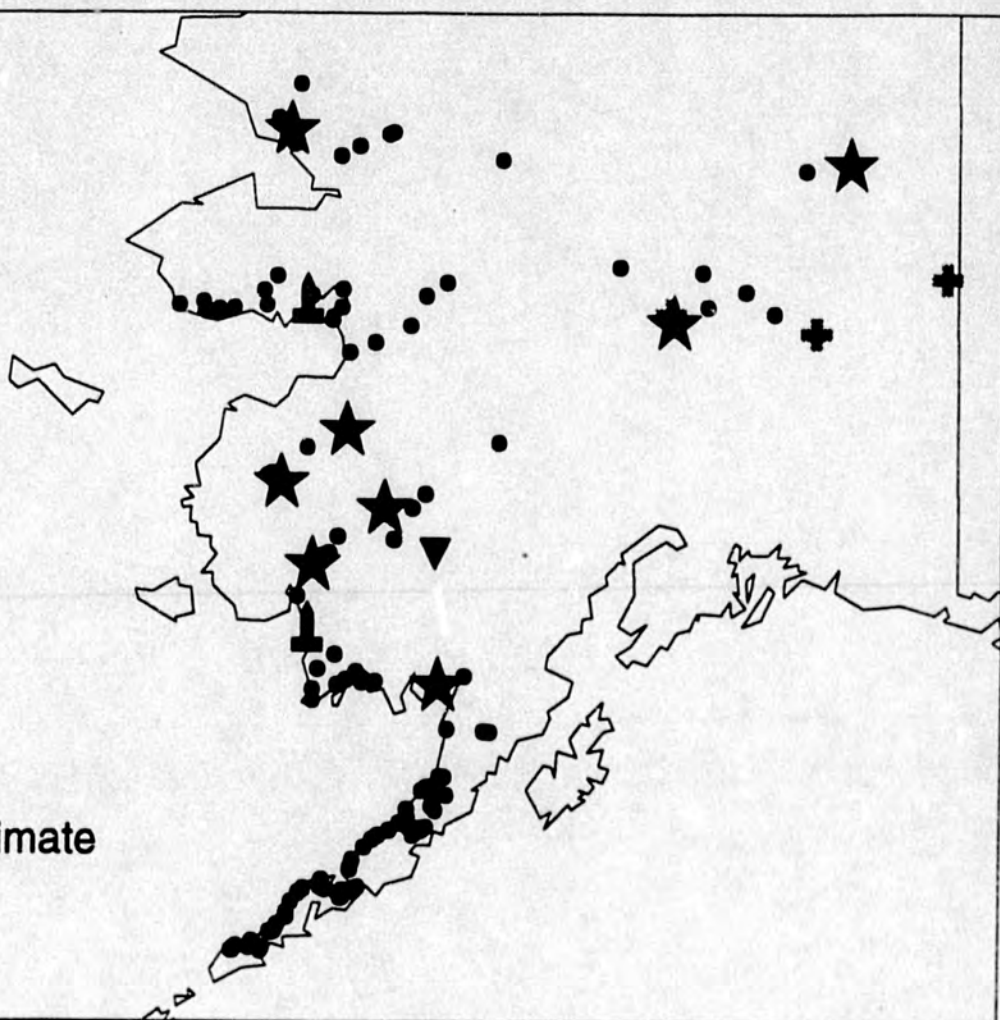
Western Alaska Sockeye Salmon Assessment

- Aerial Index
- ★ Sonar Count
- ▲ Weir Count
- ⚓ Tower Count



Western Alaska Chum Salmon Assessment

- Aerial Index
- ★ Sonar Count
- ▼ Weir Count
- ⚓ Tower Count
- + Escapement Estimate



Western Alaska Escapement Goals In Place

Sockeye

Chum



Tower Count



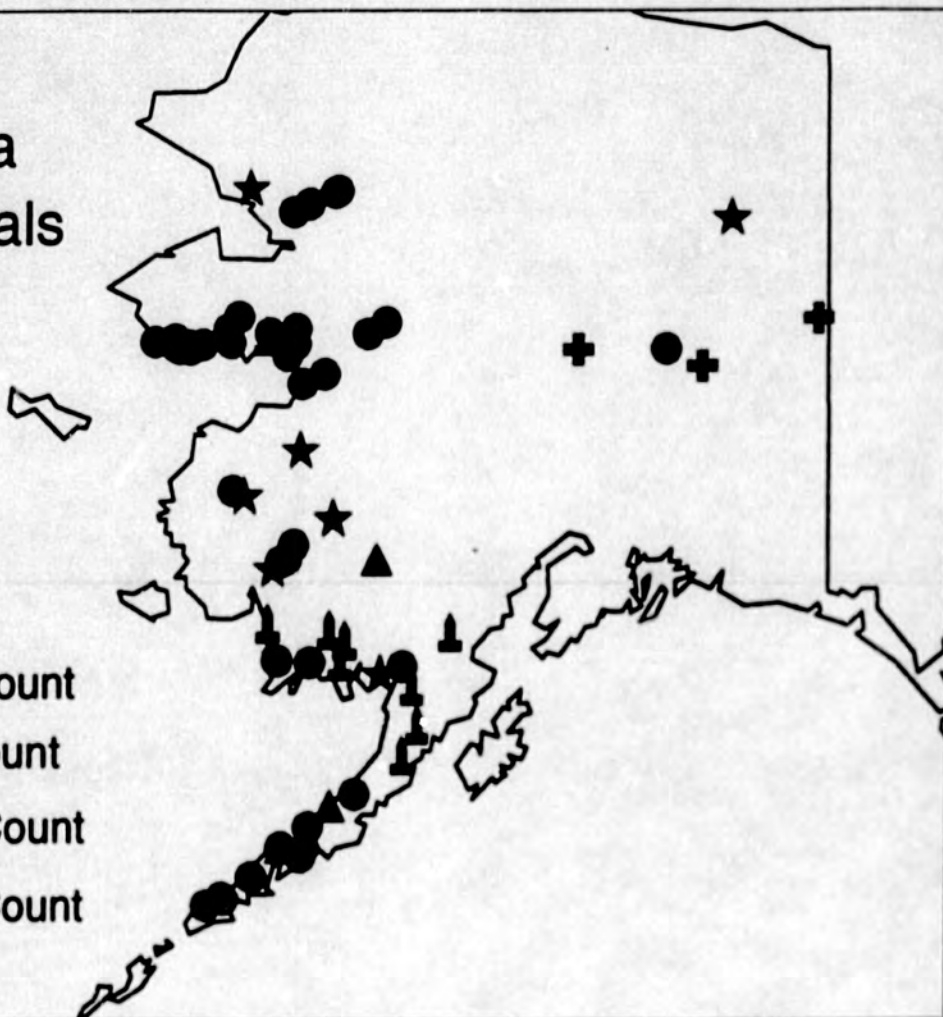
Weir Count



Sonar Count



Aerial Count



1-30-95

House Resource Committee Short Overview of CFMD Division

Introduction(s): Good Morning, my name is Dr. Jeffery Koenings and I am the director of the Commercial Fisheries Management and Development Division.

This morning I would like to briefly introduce you, first to the CF Division, second to a few examples of recent ^{directional} changes of fisheries management and development programs, and third to some present day resource problems.

#1 Overview of the CFMD Division:

The division is responsible for the sustained yield management of the state's commercial, subsistence and personal use fisheries; the development of new fisheries; and the programmatic support for the state's private-sector mariculture and salmon ranching industries. The division also plays a major role in the management of fisheries in the federal 200-mile EEZ, in several international treaty negotiations (SE and Yukon); and, more recently, in addressing concerns over federal legislation affecting Alaska's fisheries e.g., the ESA.

The divisional organization now represents the completed merger between the old FRED and Commercial Fisheries Divisions. The present division is organized into a

headquarters office and 4 regions:
Southeastern (Scott Marshall), Central
(John Hilsinger), Westward (Pete Probanco),
and AYK (Tom Kron).

The division operates with nearly 300 full time and 555 PPT positions; and a proposed FY 96 general fund budget of \$30 million with an overall budget of \$42 million. The FY 96 overall budget is \$8 million less than the budget for the combined divisions in FY 92.

The direct and indirect economic benefit of the commercial fishing industry is of major importance to the entire state. For example, the seafood industry is the state's largest private employer both in terms of income and employment with roughly 33,000 to 36,000 jobs. The seafood harvesters are small businessmen that account for 8,000 to 12,000 full time job equivalents. 77% of these commercial fishing permit holders are Alaskan residents. For more information please see this new brochure on the Alaska Seafood Industry that was developed by all segments of the fishing community.

The cultural and economic value of the subsistence fishery is even harder to quantify, in direct economic terms, than the commercial fishery. To many it is beyond value, and that is understandable. Recently, subsistence fishers have repeatedly told me that their subsistence

lifestyle, a combination of fishing, hunting, berry picking etc, is fueled, to varying degrees, by their incomes from commercial fishing. My point being that there is absolute value and real benefits in having strong, well managed runs of fish so that both the subsistence users and commercial users are provided for.

#2 Recent Examples of Changes to Fisheries Management and Development Programs:

Overall the state's fisheries resources appear to be vibrant and healthy, although problem areas do exist especially in Western and Interior Alaska. Last year the commercial harvest of 196 million salmon was an all time record. Yet, because of competition from high quality foreign farmed salmon, prices are down and the economic value is declining. The department is responding by managing, within biological constraints, so fishermen and processors can achieve the best product quality and thus higher economic value.

Examples for 1994 include the harvest management of enhanced and wild pink salmon in PWS, chin salmon in the Kachikwin River, the herring fishery in the Ugialik district, and pink salmon in Norton Sound.

In developing new fisheries, the division has pioneered new cooperative efforts with private industry to assess the health of the sea urchin population in the Kachikwin

area prior to a commercial fishery.

The project provides for close cooperation between local divers and processors and is funded entirely by private dollars and by the sea urchin resource itself, and not by the general fund. If successful, the fishery could be worth \$30 million annually to southeast fishermen and may become the third largest fishery in state waters.

Reasonable and responsible development of our renewable fishery resources will lead to increased numbers of jobs for Alaskans.

2) Resource problems:

Despite the general abundance of salmon, which are now on the high end of their productive cycle, we do have localized resource problems. For example, the chinook salmon in the Kuskokwim valley, the chum salmon in parts of western and Eastern Alaska, Walleye River chum salmon in ID, and perhaps the sockeye salmon of Chukotka Sea. Also, the hunting populations in FYB are in horrible shape and are not fishable.

However, the biggest challenge throughout the state is the management of our shellfish resources. From Norton Sound in the north to Sitka in the south there are ID, Kodiak, Cook Inlet, and FYB. The crab populations are falling. Some of the most important crab fisheries are in the Norton

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state of the state is the state.

In closing, I would like to express my
thanks to the state, and would like to see
the state's position in the state and
of the state government.

Thank you.

W. J. L. N. J. 1990

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Source: *Statistical Abstract of the United States*, 1997, Table 1201.

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MAJOR MARINE FISHERIES ISSUES

1. Depressed Stocks

e.g., Prince William Sound herring, most shrimp and crab stocks statewide, Southeast Alaska abalone

2. Limited Stock Assessments

(1) expand coverage (e.g., Bering Sea king crabs); (2) improved population estimation analyses; (2) newly developing fisheries without assessment data

3. Bycatch in Groundfish Fisheries

Limits on incidental take of king and chum salmon, herring, crabs in groundfish trawl fisheries

4. Complex State/Federal Management Jurisdictions

Resolve 0-3 mile management issues in context of recent federal actions (moratoria, IFQs, observer programs)

Alaska Department of Fish and Game
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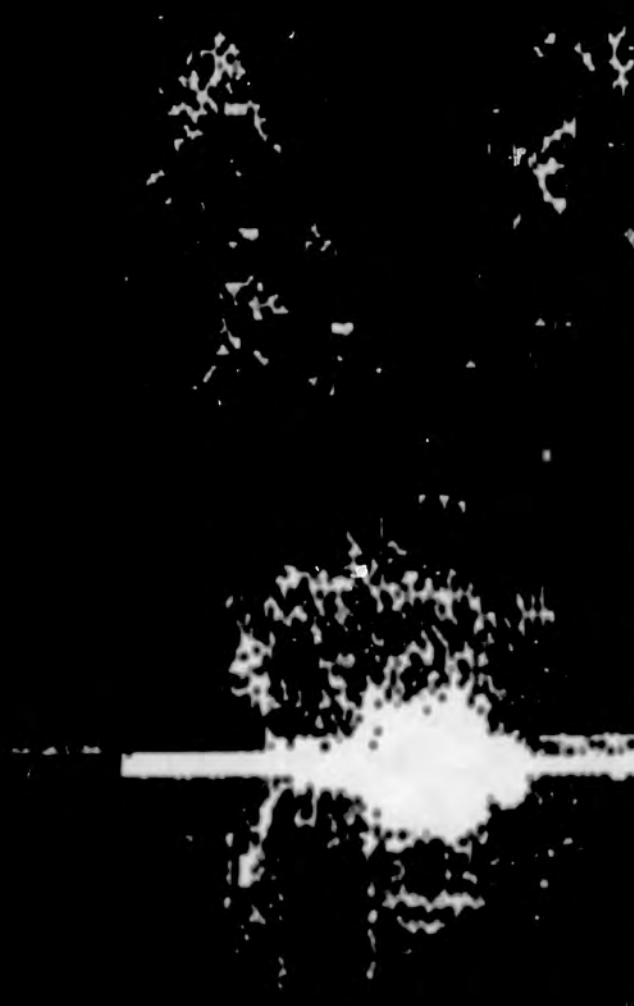
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O.E.O.
U. S. Department of the Interior
Washington, D.C. 20240

Support

Your Local

Sport Fish Harvest Survey



The ADF&G Statewide Harvest Survey

How do we balance *this* checkbook?

Our world-famous Alaska sport fisheries—sustenance for some, natural beauty of wilderness for others, the angling experience of a lifetime for yet others—

For preservation of all these values, fish populations in Alaska must be monitored to assure their long-range survival. We know by aerial surveys and by weir counts how many fish are entering the rivers. We have to find out by some means how many fish are being taken out of the rivers or harvested in marine waters.

Why do we need this information? The Alaska Board of Fisheries needs it to make informed decisions on restricting—or liberalizing—Alaska sport fishing regulations each season.

We can't be everywhere—

Every year, hundreds of thousands of people sport fish in Alaska waters. In 1993, more than 100,000 anglers from about 54,000 households sport fished in Southeast Alaska alone.

How does ADF&G keep track of the fish all these folks catch? We can't be everywhere, but there are ways to estimate total catch and harvest within acceptable limits of accuracy.

The methods we use to estimate sport harvests are like the methods used to estimate life expectancies of batteries and light bulbs, effectiveness of newly developed prescription drugs, or even viewer preferences for TV shows.

In all these instances, a random sample must be used, because it would be far too costly to

costly to test every battery and light bulb or to determine what every viewer in the United States thought of a new TV show. And it would be too costly, intrusive, and even dangerous to administer a new drug to everyone with the flu to find out if it makes them feel better. Drug effectiveness or viewer preferences can never be known with absolute certainty, but a large enough sample can be drawn to ensure that they are known within a specified precision. Public opinion surveys, for example, use 200 or 300 households for a sample, but when laboratories evaluate potentially lethal side effects of a new drug product, it may be necessary to survey thousands of patients.

ADF&G draws its sample data from two sources: mailout questionnaires for the statewide sport fish harvest survey and on-site interviews for creel surveys. Each of these yields data which are then used to form estimates of total sport fishing harvest and effort.

The statewide sport fish harvest survey

The ADF&G statewide sport fish harvest survey is a yearly mailout questionnaire. It is sent to a random sample of about 10% of the anglers who buy licenses to sport fish in Alaska. This sample size allows us to estimate harvests and other statistics with a desired level of precision.

In the Southeast region, 9,720 anglers were selected to receive mailout questionnaires in 1993. Harvests were then estimated by calculating the average harvest per responding household, adjusting this average for nonresponding households, and multiplying the result by the total number of households that fished in Southeast Alaska.

Have you met your local creel survey tech?

Another way ADF&G keeps track of the sport harvest is to have our personnel gather information directly from anglers at the dock or river bank—we call it a "creel" survey.

Creel survey technicians carry out the duties of ADF&G data gathering by stationing themselves at docks and boat ramps to ask anglers about the fishing results they encountered while they were out.

Survey planners select heavily used access points—in Juneau, for example, more than 10 docks and boat ramps are monitored—so that large data samples are collected, adding to the precision of estimates. Creel survey techs find out how many fish anglers at these locations harvest over a given day.

From these raw data, ADF&G biologists expand the totals statistically to account for periods when no technicians are on duty. For instance, if technicians are on duty at a harbor for 3 days a week, the estimated harvest for an entire week at the harbor is 7/3 times the sampled harvest.

Creel surveys are more expensive than mailout surveys, and also less comprehensive, but they do provide an opportunity to collect data during the season—



when it is needed for inseason management—on harvest timing, ages, lengths, and tagging information.

How can we tell when we're on the right track?

When the numbers extrapolated from creel survey data are matched with estimates from mailout questionnaires, the results match very closely.

For example, creel survey data for Southeast Alaska were used in 1992 and 1993 to estimate



ADF&G creel survey technicians interview anglers at Juneau's Auke Bay dock.

estimates. The average harvest of king salmon determined by the mailout surveys was 46,069, and the harvest projected from creel survey estimates was 46,796—a variation of only 1.6% (727 fish out of the total of 46,069).

The statewide sport fish harvest survey and the Department's various creel survey programs provide accurate, reliable information. As a Board member, I rely heavily on this information when making decisions on fishing regulations.

*... Larry Engel
Alaska Board of Fisheries*

Over the past 16 years, ADF&G sport fisheries biologists have been able to predict trends and base management actions on these figures. This system of matching both sets of data against each other and performing statistical cross-checks over the results has confirmed that creel and statewide harvest survey data are reliable—both in actual numbers and in trends indicated.

The Commercial Fish ticket system

You might think that because commercial harvests of salmon are tallied on fish tickets, the commercial harvest is known with absolute certainty—this would be a misleading assumption.

Although the *weight* of commercially sold salmon is precisely measured, the *number* of salmon sold is often determined by weighing a sample container of fish from the boat, counting the fish in that container, and then applying that average weight to the entire catch of the boat.

Sampling errors are relatively small (one-half of 1 percent), but you have to remember that an error in estimating the average weight of a boatload of commercially caught coho salmon may translate into an error of 15,000 fish when estimating the total Southeast Alaska commercial harvest. The absolute precision of the estimated *sport* harvest of coho salmon in Southeast Alaska is substantially better than 15,000 fish. Also, salmon which are caught commercially but taken home or given away or otherwise not sold have not been reported on the commercial harvest fish ticket.

The check is in the... mailout

When ADF&G mails out the annual statewide sport fish harvest survey questionnaires, we rely on the willingness of anglers to take time and jot down their responses to us, because your response is our best check of the accuracy of creel survey figures.

So far, mailout responses have been substantial enough to give us a reliable basis for statistical cross-checks. We need to continue this excellent rate of response—if you have questions about a questionnaire you may have received, please call us. Our accuracy depends on your continued cooperation in the process.

Your odds are good

If you buy a sport fishing license in Alaska this year, you may be one of the 38,000 or so people who will receive a statewide harvest survey questionnaire in the mail. If you receive one, please fill it out and return it to us. ADF&G needs completed questionnaires from every recipient: even if you bought a license and didn't get a chance to fish, or just fished once or twice and weren't very successful.

The information you supply helps ensure the continuing opportunity for recreational harvest by sport anglers in Alaska.



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