The Seafood Industry in Alaska's Economy

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northern economics inc.

Prepared for

Marine Conservation Alliance

At-Sea Processors Association

Pacific Seafood Processors Association

January 2009

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Abbreviations

ADCCED	Alaska Department of Commerce, Community and Economic Development
ADF&G	Alaska Department of Fish and Game
ADOLWD	Alaska Department of Labor and Workforce Development
ADOR	Alaska Department of Revenue
BSAI	Bering Sea/Aleutian Islands
CFEC	Commercial Fisheries Entry Commission
CDQ	Community Development Quota
EEZ	Exclusive Economic Zone
GOA	Gulf of Alaska
IFQ	individual fishing quota
IPHC	International Pacific Halibut Commission
MSC	Marine Stewardship Council
mt	metric tons
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NPFMC	North Pacific Fishery Management Council
USCG	U.S. Coast Guard

Glossary

At-sea processing sector: Includes vessels that process catch at-sea, such as catcher-processors or motherships, and catcher vessels that deliver fish or shellfish to at-sea processors.

Average Employment: In this document average employment refers to the average number of employees over the course of a given year at shore-based processing plants and associated facilities. These estimates are based on ES-202 reports (see **ES-202 Reports**) submitted to the Alaska Department of Labor and Workforce Development (ADOLWD).

Basic sector: Those firms that export a large share of their production, thereby bringing in revenue from outside the state. In-state federal government expenditures, Permanent Fund dividend payments and expenditures by out-of-state tourists are also basic sector activities.

Catcher processor: A vessel that processes its own catch; some catcher processors also purchase fish or shellfish harvested by catcher vessels and process that catch.

Catcher vessel: A vessel that is used for catching fish or shellfish and that does not process fish or shellfish on board.

Direct economic impacts: The initial, immediate economic effects (i.e., output, employment, income) caused by a specific activity; direct impacts initiate subsequent rounds of spending and re-spending and result in indirect and induced impacts.

ES-202 Reports: These reports are required by the US Employment Security (ES) Act as a means to track employment and employees for purposes of unemployment insurance. Employers paying wages and salaries are required to submit ES-202 reports to their state's department of labor every quarter. The form asks employers to indicate the industry sector in which they operate and to report persons (by name and social security number) that were employed on the 12th day of each month within the quarter. From this report, ADOLWD can generate estimates of the number of wage and salary employees in an industry in any month and also the average number of employees over the course of the year. In addition, because they have the social security numbers of individuals employed at each firm they can estimate the total workforce utilized in the industry. In Alaska, ADOLWD is also able to estimate the residency status of the workforce using the database generated for the permanent fund dividend. It should be noted that firms that operate fishing vessels are not required to submit ES-202 forms, and therefore estimates regarding employment and workforce in the fish harvesting industry are much less certain than estimates of employment and workforce in the fish processing industry.

Ex-vessel value: This term nominally means the value of harvested but unprocessed fish as it transferred off of the harvesting vessel. Typically the ex-vessel value equals the amount of money that fishing vessels receive for unprocessed fish or shellfish; ex-vessel value is equal to the quantity of fish or shellfish retained for processing multiplied by the ex-vessel (dockside) per-unit price. Catcher processors do not technically generate an ex-vessel value, but a value may be imputed from catcher processor harvested fish—see **Imputed Ex-vessel Value**.

Factory trawler: A larger catcher-processor equipped as a stern trawler.

First wholesale value: Amount of money that first processors receive for their product; first wholesale value is equal to the quantity of processed product multiplied by the wholesale product price after primary processing.

Fisheries business tax: State tax levied on fisheries businesses and persons who process or export fisheries resource from Alaska. The tax is based on the fisheries value paid to commercial seafood harvesters or fair market value when there is not an arms length transaction. Fisheries business tax is

collected primarily from licensed processors and persons who export fish from Alaska. The tax rate is 3 percent.

Fishery resource landing tax: State tax levied on processed fishery resource first landed in Alaska or any processed fishery resource subject to sec. 210(f) of the American Fisheries Act. The tax is based on the unprocessed value of the resource, which is determined by multiplying a statewide average price per pound by the unprocessed weight. Fishery Resource Landing Tax is collected primarily from factory trawlers and floating processors which process fishery resource outside of the state's 3-mile limit and bring their products into Alaska for transshipment. The tax rate is 3 percent.

Imputed Ex-vessel Value: Catcher processors, because their fish are fed directly into their on-board processing lines do not generate a financial transaction in which fish are bought or sold. Technically, therefore, there is no ex-vessel price associated with the raw/unprocessed fish. In order to account for the value of this fish, so that it can be compared to other fisheries, an ex-vessel value is often imputed for them. The imputed ex-vessel value is equal to the price per pound of shore based fish of the same species caught in a similar location with a similar gear multiplied by the amount of catcher processor harvests.

Indirect economic impacts: The economic impacts that result from an activity purchasing local goods and services to produce its products.

Induced economic impacts: The economic impacts that result from local spending of income and government revenue generated by direct and indirect activities.

Job: As used in this report, the term "job" refers to a particular full or part-time employment opportunity.

Mothership: A vessel engaged solely in processing; motherships operate at sea by taking deliveries of fish or shellfish harvested by catcher vessels and processing them.

Nominal dollars: Dollars unadjusted for inflation.

Output: The value of goods and services produced by an activity. Output is also a measure of sales.

Payments to labor: Wages and salaries.

Real dollars: Dollars adjusted for inflation.

Secondary economic impacts: The sum of the indirect and induced economic impacts of an activity.

Shore-side processor: Any land-based person, company or vessel that receives unprocessed or limited-processed fish or shellfish, except catcher-processors, motherships, buying stations, restaurants or persons receiving fish or shellfish for personal consumption or bait.

Stationary floating processor: A vessel operating as a processor that remains anchored or otherwise remains stationary in a single location while receiving or processing fish or shellfish.

Total economic impacts: The sum of the direct, indirect and induced economic impacts of an activity.

Workers: In this document the term workers is used to mean participants in the workforce.

Workforce: In this document workforce means the estimated number of individuals that work in a particular industry sector or region. In theory, if two persons fill a particular job over the course of a year, the workforce for that job is two. In the harvesting sector and the at-sea sector, the workforce is undocumented—there is no listing of all of the individuals that have worked onboard a fishing vessel. Therefore, the workforce is estimated based on standardized parameters and assumptions.

Executive Summary

The commercial harvesting and processing of fish and other seafood products is part of Alaska's historical heritage dating back well over 100 years. The industry started with cod, halibut, herring and salmon in the late 1800s and early 1900s and has grown to include today's sophisticated offshore fisheries for pollock, cod, crab, and other species. As a major player in global markets, Alaska's seafood industry is an economic engine for the state and the nation. If Alaska were an independent country, it would rank in the top 10 of seafood producing nations. On the national scale, Alaska produces over half the United States' seafood landings. Alaska has 8 of the 20 largest seafood ports nationally (based on ex-vessel value of product): Unalaska/Dutch Harbor (2nd); Kodiak (3rd); Naknek-King Salmon (7th); Seward (9th); Sitka (10th) Cordova (11th), Homer (13th); and Petersburg (16th). Additionally, Unalaska/Dutch Harbor has been one of the nation's highest volume seafood ports for years. Within Alaska, the industry is the largest private sector employer, and provides jobs and revenues to communities throughout the state.

The seafood industry in Alaska is dependent on a healthy marine ecosystem and access to sustainable stocks of fish and shellfish. Management is science-driven and conservation comes first. Alaska's fishery management systems are held up as examples to fisheries around the world. The Pew Ocean Commission, as well as the United States Commission on Oceans Policy found that Alaska's fisheries are some of the best managed fisheries in the country, citing the role of science in setting catch limits, efforts to control bycatch and protect habitat. National Geographic (Montaigne, 2007) identified Alaska as one of the three best managed and most sustainable fisheries in the world.

The mosaic of fisheries in Alaska is complex. State fisheries include salmon, herring, shellfish, and other species harvested within three miles of shore and in Alaska's vast network of rivers and lakes. Federal fisheries are those harvested beyond 3 miles, in federal waters out to the 200 mile limit. Federal fisheries include some of the nation's largest, such as pollock, cod, and crab. All of these fisheries, both federal and state, contribute to the economic and social well-being of Alaska's coastal communities, its urban cities, and the state as a whole.

Some highlights of the economic importance of the Alaska seafood industry include:

Importance of Alaska to the Global Seafood Market

If Alaska were a nation, it would place 9th among seafood producing countries.

The groundfish fishery in the waters off Alaska is among the largest fisheries in the world. Alaska landings of traditional global groundfish species groups (including cod, pollock, hake, and haddock) and flatfish accounted for about one-fifth of the world harvest of these species groups in 2006.

In the same year, around 42 percent of the world capture production of species in the "salmon, trout, smelt" group occurred in Alaska waters.

Alaska is the top producer of wild, high-value salmon, producing nearly 80 percent of the world supply of wild king, sockeye and coho.

Importance of Alaska Seafood to the U.S.

In 2007, Alaska accounted for over 62 percent of the volume of the commercial seafood harvested in the United States.

Alaska as a single state led all other multi-state regions in the US in terms of ex-vessel value with over 37 percent of the US total. The five New England States combined for a distant second at with 21 percent, followed by the five states on the Gulf of Mexico with 16 percent.

In terms of volume, Alaska's pollock fishery is the largest in the U.S., accounting for more than one-third of total U.S. fisheries landings.

Alaska also accounted for 96 percent of total U.S. commercial landings of salmon in 2007, and approximately one-third or more of total U.S. crab catches. U.S. domestic production of king and snow crab comes entirely from Alaska.

Alaska landings accounted for over 90 percent of the U.S. Pacific Ocean herring harvest and over 75 percent of the US commercial catch of Pacific Halibut in 2007.

Since 1997, Dutch Harbor-Unalaska has been the leading U.S. fishing port in quantity of commercial fishery landings. In 2006, the port had record landings for quantity at a U.S. port, with more than 414,200 mt of seafood.

In 2007, Alaska had two of the country's three top fishing ports ranked by total harvest value. Dutch Harbor-Unalaska ranked second (after New Bedford, MA) with a harvest value of $174 million; Kodiak moved was ranked third with $126 million in harvest value.

In the list of top 100 U.S. ports based on volume for 2007, Alaska had 14 including: Unalaska/Dutch Harbor(1st); Kodiak (4th); Naknek-King Salmon (11th); Cordova (12th); Ketchikan (17th); Petersburg (18th); Seward (19th); Sitka (22nd); Juneau (37th); Homer (41th); Kenai (57th); Wrangell (53rd); Yakutat (64th); Anchorage (78th). Were it not for confidentiality restrictions for ports with 3 or fewer companies, Akutan, King Cove, and Sandpoint would all be listed in the top 20.

Importance of Alaska Seafood to Alaska

The total estimated ex-vessel value of Alaska's commercial harvest was $1.55 billion in 2007.[1]

The additional value added by Alaska's seafood processing sector brought the total wholesale value of Alaska's commercial seafood industry to over $3.6 billion in 2007.

It is estimated that the seafood industry's $3.6 billion in wholesale value generated an additional $2.2 billion in indirect and induced economic output for a total contribution of $5.8 billion to Alaska's economic output. The seafood industry also generated a total of 78,519 direct, indirect and induced jobs and $1.75 billion in direct, indirect and induced payments to labor and income.

While data for 2007 are not available it is estimated that in 2006, the wholesale value generated by the seafood industry represented over 9.4 percent of the $36.4 billion basic sector activity in Alaska's economy. The basic sector, because it brings money into the state from outside, is the driving force behind all economic activity in the state.

The seafood industry ranks third in importance behind the North Slope oil and gas industry and federal government in terms of generating basic economic activity in Alaska.

According to ADCCED (2007), seafood is Alaska's top international export—seafood exports accounted for half of the State's total export value.

In 2006, seafood processing accounted for about 80 percent of all manufacturing jobs in the state.

With an estimated workforce of 56,606, the seafood industry employs more workers than any other industry sector in Alaska. The retail and wholesale trade sector follows with a workforce of 56,445.

With the concentration of major fishing ports in the Aleutian and Pribilof Islands region, seafood processing accounted for 65.4 percent of all private sector payments to labor in that region in 2007.

[1] This estimate includes the imputed ex-vessel value of the crab and groundfish that are harvested by vessels that both catch and process seafood, i.e. catcher processors. Because these vessels process their own catch they do not make payments for their unprocessed fish, nor do they report the unprocessed value of their catch.

The seafood processing industry is estimated to have accounted for over 33 percent of private sector payments to labor in Bristol Bay and 39 percent of private sectors payment to labor in Kodiak.

The Community Development Quota (CDQ) Program augments the important role of the seafood industry in Western Alaska. Sixty-five Bering Sea communities participate in the CDQ Program.

From 1992 through 2005 the CDQ Program generated over $362 million in net income.

The value of CDQ group assets in the aggregate increased from about $13.3 million in 1992 to over $415 million in 2005.

1 Introduction

The commercial harvesting and processing of fish and other seafood products is part of Alaska's historical heritage dating back well over 100 years. Starting with cod, herring, halibut, and salmon in the 1800s and growing to include today's sophisticated offshore fisheries for pollock, cod, crab, and other species. As a major player in global markets, Alaska's seafood industry is an economic engine for the state and the nation. If Alaska were an independent country, it would rank in the top 10 of seafood producing nations. On the national scale, Alaska produces over half the United States' seafood landings, and Unalaska/Dutch Harbor has consistently been the nation's highest volume seafood port for years. Within Alaska, the industry is one of Alaska's largest private sector employers, and provides jobs and revenues to communities throughout the state.

The mosaic of fisheries in Alaska is complex. State fisheries include salmon, herring, shellfish, and other species harvested within 3 miles of shore and in Alaska's vast network of rivers and lakes. Federal fisheries are those harvested beyond 3 miles, in federal waters out to the 200 mile limit. Federal fisheries include some of the nation's largest, such as pollock, cod, and crab. All of these fisheries, both federal and state, contribute to the economic and social well-being of Alaska's coastal communities, its urban cities, and the state as a whole.

1.1 Purpose and Organization

The purpose of this report is to describe the economic importance of Alaska's seafood industry, focusing primarily on the industry's significance to the state economy. The report draws on data from a wide range of sources and presents those data in a precise, easy-to-read format. The report includes extensive footnotes for those readers who want additional information.

Chapter 2 offers a historical overview of the growth of Alaska's seafood industry, with a focus on the development of the fisheries for the major species or species groups, including groundfish, shellfish, salmon, herring and halibut. Chapter 3 presents a comparison of the Alaska seafood industry with national and international seafood industries.

Chapter 4 provides a "snapshot" of the contemporary economic impacts of Alaska's seafood industry using data from 2006 and 2007—whichever was the most recent data available. In addition to presenting the estimated economic effects of the seafood industry on the state as a whole, the analysis differentiates the impacts by:

- Region of industry activity (Southeast, Southcentral, Kodiak, Aleutian and Pribilof Islands, Bristol Bay, Yukon-Kuskokwim, Northwest and Arctic)
- Residency of participants (Alaska resident, nonresident)
- Fisheries jurisdictional area (federal, state, joint)
- Major target species or species group

Chapter 4 also includes a discussion of the economic effects of two commercial fisheries–related areas of special interest: 1) in-state expenditures for commercial fisheries management and research by State of Alaska and federal agencies and 2) the Community Development Quota Program, a federal fisheries program established in 1992 with the goal of promoting fisheries-related economic development in western Alaska.

1.2 Data Sources

In general, data reporting the volume and value of catches of Alaska's fisheries are considered to be among the best in the US and around the world. Most of the harvesting and processing data used in this report for Alaska fisheries were provided by the Alaska Fisheries Science Center of the National Marine Fisheries Service (NMFS) at the request of Northern Economics, Inc. These data include estimates of the ex-vessel value and first wholesale value of Alaska fish and shellfish landings in 2007. Information on the historical trend in the ex-vessel value of Alaska fisheries was provided by the economic component of the Stock Assessment and Fishery Evaluation (SAFE) report published by NMFS (Hiatt, 2008b)

The majority of employment and income data were obtained from the "Seafood Industry" Web site developed by the Research and Analysis Division of the Alaska Department of Labor and Workforce Development (ADOLWD). The data sources and methodology used to derive employment estimates are described on ADOLWD's Seafood Industry Web site.[2]

While catch volume and value data regarding Alaska's fisheries are deemed to be very reliable, information on employment, particularly employment in harvesting operations and in at-sea processing operations, is considered much less reliable. (Northern Economics, Inc., 2007). Harvesters and at-sea processing employees differ from other groups involved in harvesting and processing seafood in terms of the amount of data collected on their activities, and these differences result in less overall information being available for stakeholders. Individuals working in Alaska's shore-based fish processing sector are wage-and-salary employees. This classification means that the number of processing jobs is recorded in the annual average monthly employment statistics reported by the ADOLWD. Commercial fish harvesters and at-sea processing employees are exempted from unemployment insurance and other employment reporting requirements because these crewmembers are classified as self-employed. Consequently, detailed information on these workers is generally not available for most Alaskan fisheries.

Because detailed data on harvesting and at-sea employment are not available, estimates of employment and income are based on data that are available—such as vessels and permits owner information—augmented with information gathered from industry sources and surveys. While Northern Economics believe these estimates are reasonable, employment and payments to labor estimates in this report should not be considered as accurate or reliable as, for example, data presented on ex-vessel or wholesale value.[3]

[2] The address of the State of Alaska's "Seafood Industry" Web site is http://almis.labor.state.ak.us/cgi/databrowsing/ ?PAGEID=4 &SUBID=300. Data sources and methodology are described on a Web page at http://www.labor.state.ak.us/research/seafood/Methodology.pdf.

[3] Funding for a program to improve seafood harvesting employment data was approved by the Alaska Legislature as part of the State's budget on April 15, 2008. (Welch, 2008).

2 Overview and History of Alaska's Seafood Industry

Alaska's seafood industry began over 130 years ago. The purpose of this chapter is to examine how Alaska's seafood industry evolved to its current prominent position in the state's economy. First, a brief historic summary of volume landed by the different fisheries from 1900 to 2007 is presented. Then an overview is provided of changes in the value of the fish and shellfish caught in Alaska's commercial fisheries over the past two decades. The remainder of the chapter briefly describes the historical development of the principal fisheries, starting from the pre-statehood period. As is shown below, each fishery has a unique history, and the development of each made a significant contribution to Alaska's economic growth.

2.1 General Overview of Alaska's Seafood Industry.

Typically, Alaska commercial fisheries are divided into five major species groups: groundfish, shellfish, salmon, herring and halibut. Figure 1 shows the total weight of landings of US fishermen by species by year between 1900 and 2006, while Figure 2 shows landings from 1900 to 1976 using a scale more appropriate to landings during those earlier years. The figures show how the volume of overall landings has fluctuated, with salmon being the largest industry by pounds landed up to the 1960s. Herring was important from the 1920s up to the 1960s, but has become less important from a volume perspective since then. Halibut, which is managed by the federal government and the International Pacific Halibut Commission (IPHC), has been relatively stable since the 1930s but has also fluctuated from year to year. Crab and shellfish became increasingly important beginning in the 1960s, then crashed in the late 1970s and have fluctuated at generally lower levels since then.

In 1976 the enactment of the Fishery Conservation and Management Act (FCMA) (Magnuson-Stevens Act)[4] marked the start of a new era of domestic groundfish fishery. Before then, the United States only claimed a 3-mile territorial sea or 12-mile contiguous zone jurisdiction and foreign vessels could fish many of the same stocks as US fishermen. While U.S. fishermen concentrated on species like salmon, herring and nearshore crab, foreign fleets concentrated on groundfish species like Pacific Ocean perch, turbot, pollock and cod. The new act was implemented to change all that. The Act extended federal jurisdiction and the control of US waters to 200 nautical miles in the ocean, and created mechanisms to control foreign fishing activities within the newly defined Fishery Conservation Zone (FCZ). The ensuing fishing reductions allowed already overfished stocks to recover and ensured good conservation and management of the fishery resources.[5] Groundfish harvests by US fishermen were relatively insignificant prior to the MSFCMA, but since 1982 the volume of groundfish increased and since after 1988 the volume has averaged over 2 million metric tons per year.

Landings volumes in 2007 by species were:

- Salmon: 390,652 mt
- Herring: 28,746 mt
- Halibut: 24,445 mt
- Crab & shellfish: 31,320 mt
- Groundfish: 2,406,000 mt
- All species combined: 2,881,162 mt

[4] Renamed in 1980 to honor the late Senator Warren G. Magnuson, and in 1996 to include Senator Ted Stevens, the FCMA is now known as the MSFCMA.

[5] Harvests of fishery resources off the coast of Alaska by foreign fishing vessels are not included in Figure 1.

Figure 1. Historic Landings US Vessels by Species off Alaska, 1900 – 2006

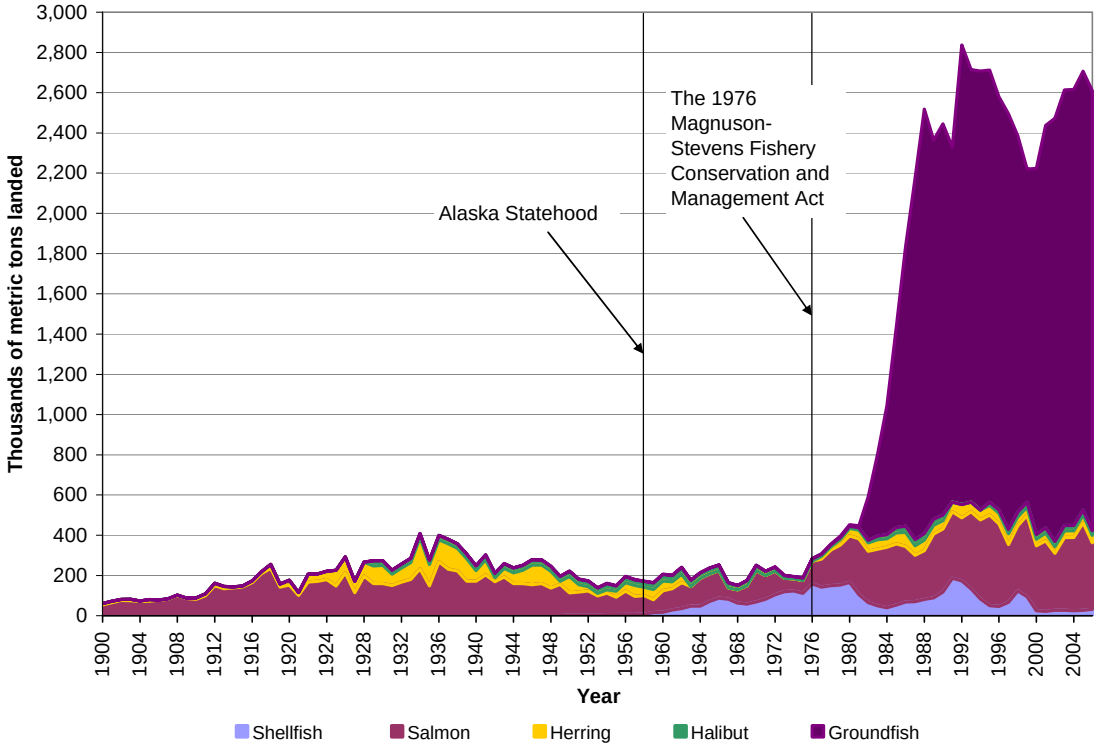
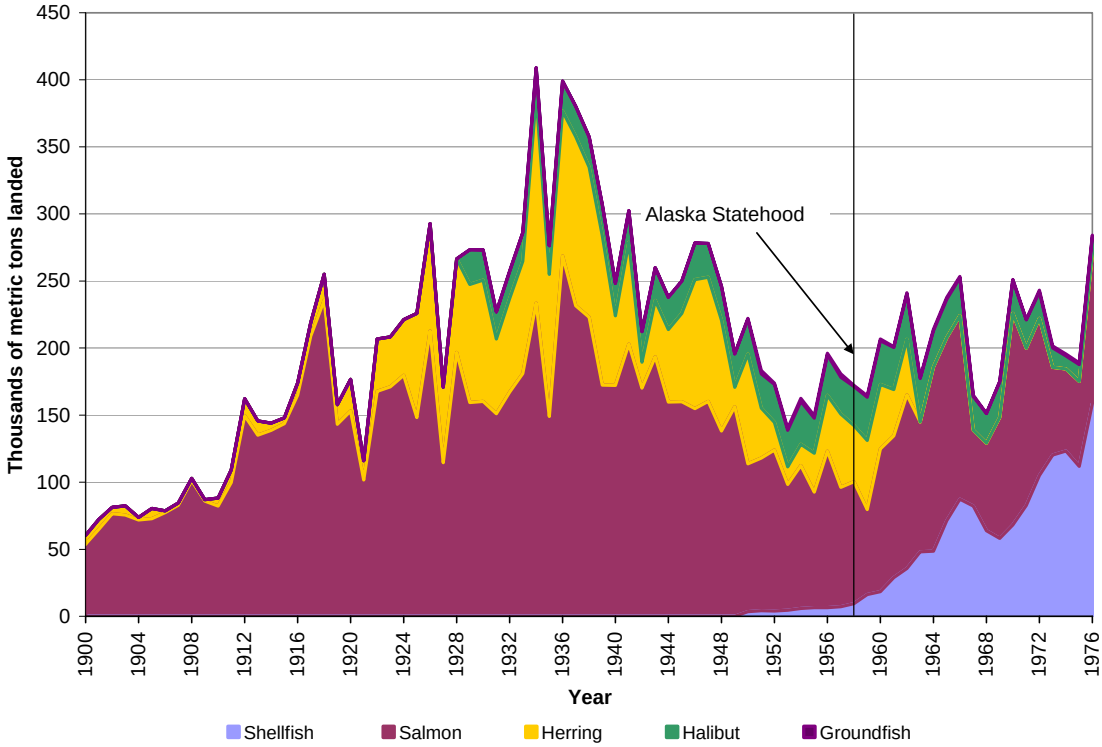


Figure 2. Details of Historic Landings by Species, 1900 – 1976

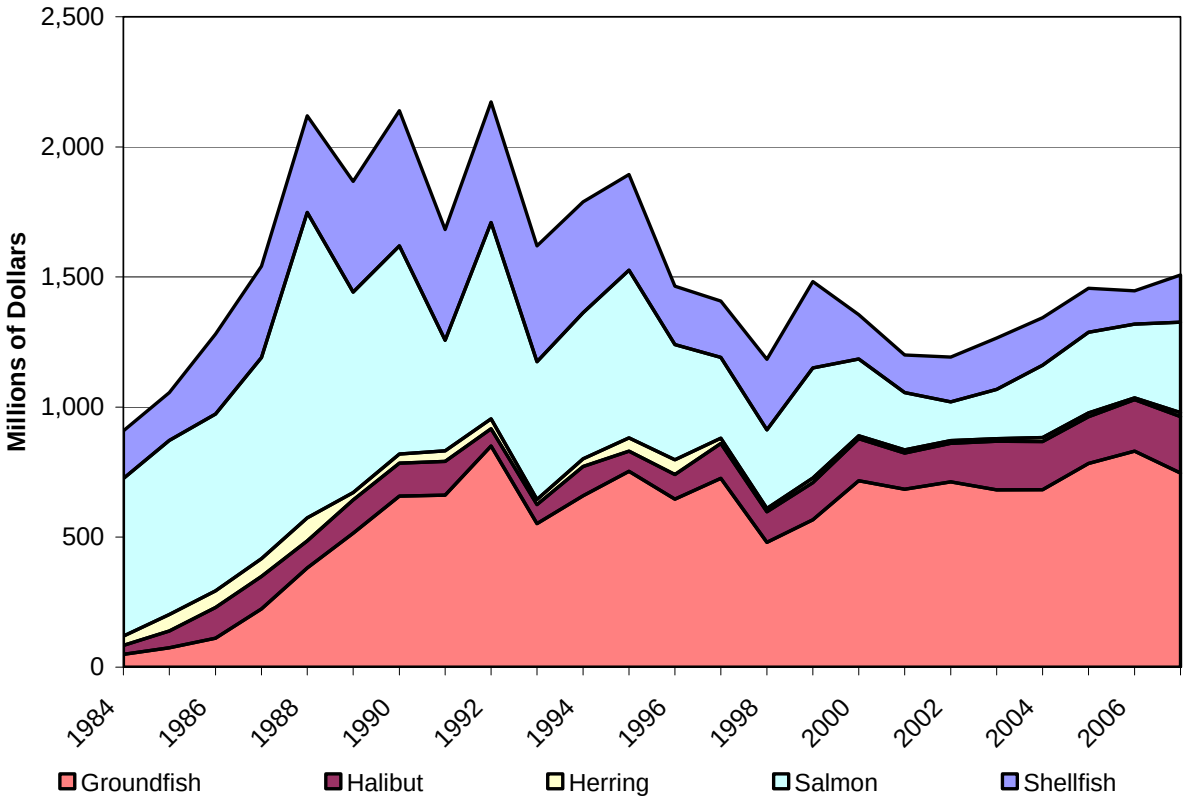


Sources for Figure 1 and Figure 2: Developed by Northern Economics from multiple sources including ADFG&G, (1987 and 2008), IPHC (2008), NMFS (2008d and 2008e), and Plotnick (2008)

From the volumes shown in the figures above, it might be interpreted that the size of the groundfish fisheries make the salmon, crab, herring, and halibut fisheries insignificant. However, most groundfish fisheries are high-volume low-value fisheries—for years the typical price received for pollock, the dominant groundfish species, was $0.8 per pound. Fish are harvested and processed for the money, and therefore the importance of the state's fisheries is judged by the values that they generate. This report will describe the values of the fisheries in terms of two primary sources of value: ex-vessel value—the value received by harvesters from buyers and processors, included an imputed ex-vessel value for catcher processors; and wholesale value—the value received by processors for the market ready product they produce.

Figure 3 shows the ex-vessel value of the Alaska harvest by species group from 1984 through 2007 as reported by Hiatt. (2008b).[6] The data have been adjusted for inflation (i.e., they are reported in real dollars). The value of landings shows considerable year-to-year variation. Much of this fluctuation can be attributed to natural changes in stock abundance for certain species that create larger or smaller harvests in some years.

Figure 3. Real Ex-vessel Value of Alaska Seafood Industry Harvest by Species Group, 1984-2007



Note: The data have been adjusted to 2007 dollars by applying GDP implicit price deflators presented in Hiatt (2008b). Also note that the ex-vessel values include imputed values from catcher processors.

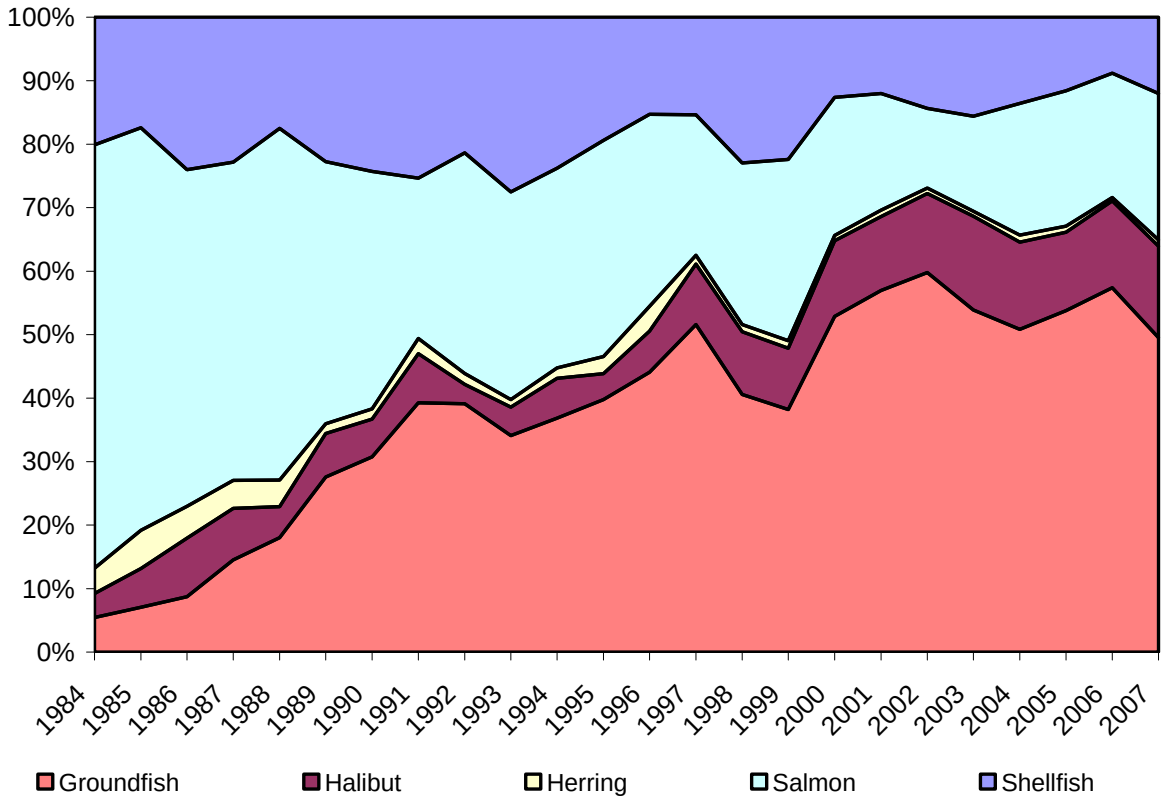
Source: Developed by Northern Economics based on data from Hiatt (2008b).

Figure 4 shows that the importance of species groups has changed over time. During the late 1980s, salmon generated about half of the total ex-vessel value of Alaska fisheries, while shellfish typically

[6] Consistently reliable data for ex-vessel value are not available for all species for earlier years.

contributed more than one-fifth of the overall value. Beginning in the early 1990s, however, groundfish displaced salmon and shellfish as the most significant component of total value. Tremendous growth in the domestic groundfish catch occurred as American harvesters and processors took over the offshore groundfish fishery from foreign fleets. The rapid expansion and profitability of the fishery earned it the reputation as "the next Alaska gold rush." Since the 1990s, groundfish catches have stabilized, but they continue to dominate the overall value and volume of Alaska's harvest. In 2007, the groundfish fishery accounted for 50 percent of the ex-vessel value of all commercial fisheries off Alaska, while the salmon fishery was second with 20 percent of the total Alaska ex-vessel value. The value of the Pacific halibut catch amounted to 14 percent of the total.

Figure 4. Percentage of Ex-vessel Value of Alaska Seafood Industry Harvest by Species Group, 1984-2007

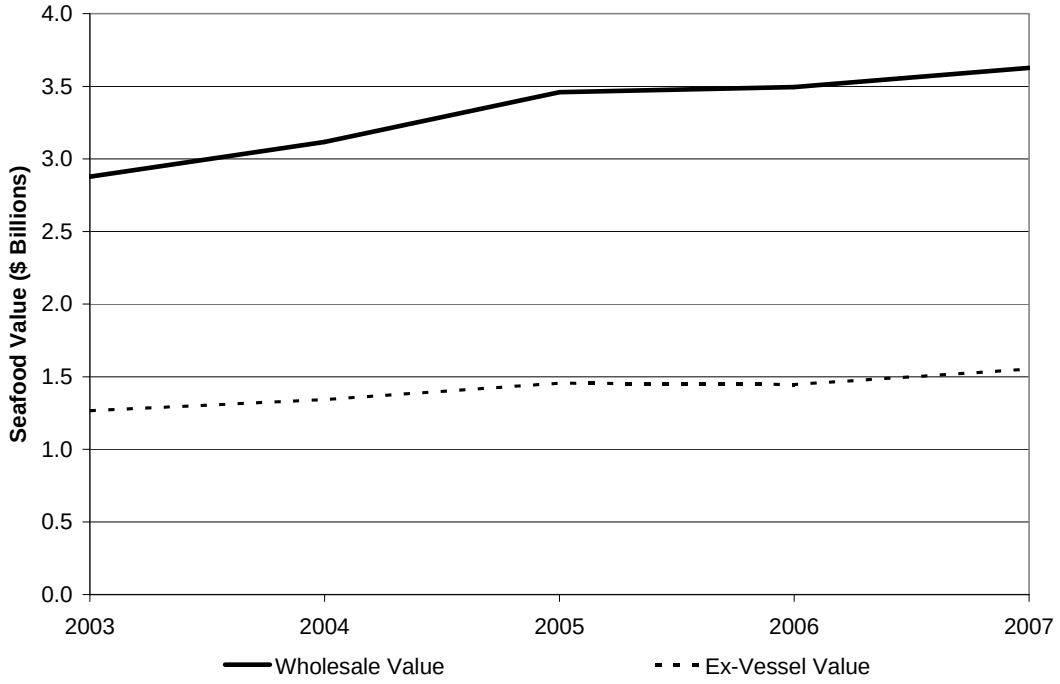


Source: Developed by Northern Economics based on data from Hiatt (2008b).

In many states and regions where fisheries are important the primary focus is on fish harvesting. In Alaska both the harvesting and the processing of seafood add significant amounts of value to the economy. Seafood processing is a critically important component of the seafood industry in Alaska because of the distance from the resource to the markets and high cost of transporting unprocessed fish to those markets. Because of the importance of processing to the understanding of the seafood industry, Alaska is one of the few regions that collect and report data on processed product volumes and perhaps more importantly, on the wholesale value that is added to the resource by processors. For many years ADF&G had a voluntary program that allowed seafood processors to report processed product values. In 2003 mandatory reporting of processed product values was required by both ADF&G and NMFS, and since then complete reliable estimates of wholesale value have become

available.[7] Figure 5 shows both the total ex-vessel value and the total wholesale value since 2003 generated in the Alaska seafood industry in terms of 2007 dollars. On average, since 2003 total ex-vessel value has been 44 percent of wholesale value.

Figure 5. Recent Trends in Real Wholesale and Ex-vessel Value in Alaska Fisheries, 2003 - 2007

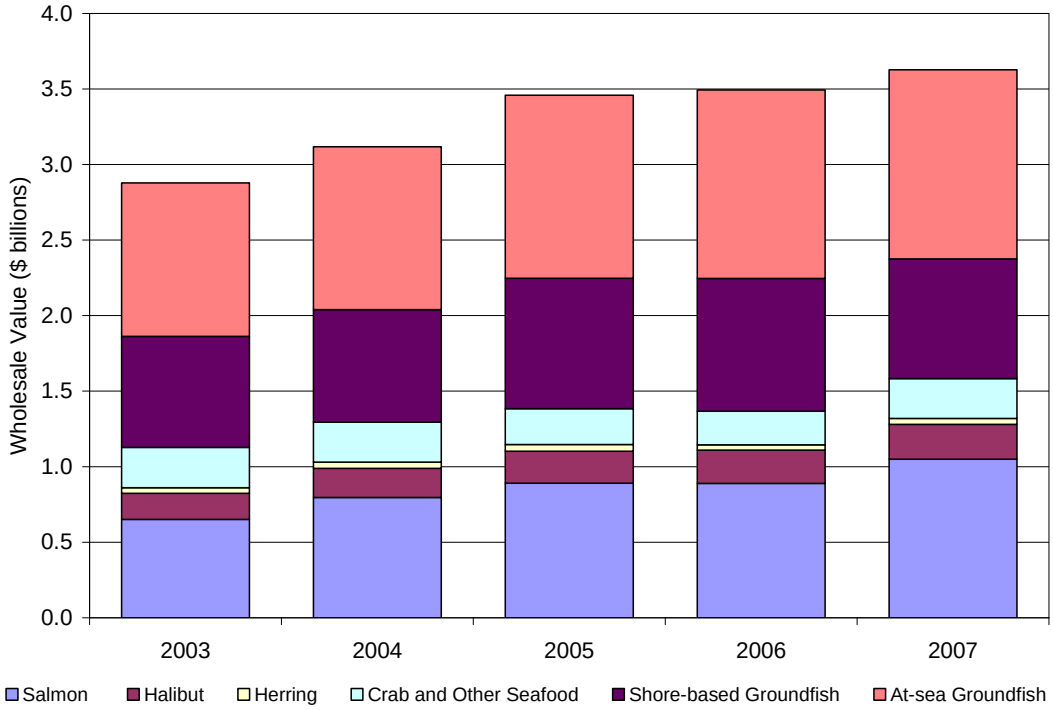


Note: The data have been adjusted to 2007 dollars by applying GDP price deflators presented in Hiatt 2008b.
Source: Developed by Northern Economics based on data from Hiatt 2008b.

Figure 6 summarizes total wholesale value in Alaska's fisheries by species after adjusting for inflation to 2007 dollars. Over the last 5 years wholesale value has increased from just over 2.88 billion to 3.63 billion, an increase in real terms of 126 percent. Of the primary species groups, the wholesale value of salmon had the greatest increases (up 62 percent), while the wholesale value of crab fell in 2005 and 2006 and then recovered in 2007.

[7] The wholesale values reported in this report include only "primary processing" values. The majority of processing in Alaska consists of "primary processing" wherein processors perform the first modification to the fish and shellfish delivered by harvesters. In some cases, the products after the initial stage of processing may be table-ready or final product. In general, however, relatively little of the output of Alaska commercial fishery harvests is sold fresh because of the remoteness of most fishing ports. More often, the primary products are reprocessed by secondary processors, the majority of which are outside of Alaska. Secondary processing adds additional value to the product, creating skinless/boneless fillets, smoked salmon, fish patties, breaded fish sticks and many other seafood products.

Figure 6. Recent Trends in Wholesale Value by Species, 2003 – 2007



Source: Developed by Northern Economics based on data from Hiatt 2008b.

The employment trend in the shore-side processing sector of Alaska's seafood industry is shown in Figure 7, which reports the annual average of monthly employment by year from 1980 to 2007. After the collapse of Alaska's king crab fishery in the early 1980s, processing employment slid for three years and then changed little for the next three. But in 1988, the aforementioned "Americanization" of the groundfish resources[8] began to "turbo-charge" Alaska's seafood processing sector (Fried 1996). The peak in shore-side processing labor in 1992 corresponds to a record high harvest volume and total ex-vessel value. In that year large groundfish and Bering Sea snow crab catches, together with record salmon harvests, increased the demand for processor workers.

The employment numbers in Figure 7 exclude processing workers in the at-sea component of the industry (catcher processor and motherships). These vessels are not included in ADOLWD estimates of seafood processing workers because much of their employment occurs outside the state's jurisdiction, and comparable time series data simply do not exist. A similar problem exists with respect to harvesting employment—fish harvesting crews are considered self-employed contractors and as such there are no comparable or consistent data sources that report employment numbers for fish harvesters.[9]

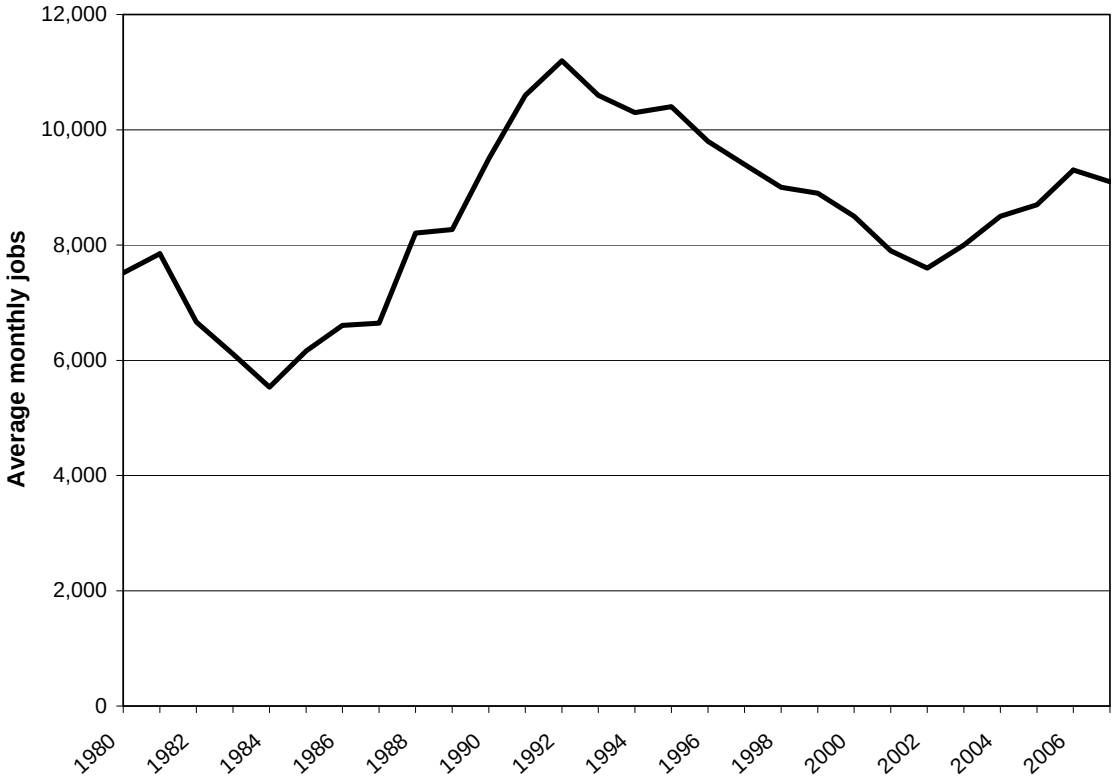
While there are no official time-series data reporting fish harvesting employment, nor at-sea processing employment, it is possible to estimate these data on an *ad hoc* basis for a given year, using assumptions of the number of crew members on various types of fishing operations. Using data from ADOLWD (2007c) and Hiatt (20008a) it is estimated that between 2003 and 2007 the annual average of monthly employment in the harvesting sector ranges from 7,500 to 8,500, with an

[8] The "Americanization" of the groundfish industry is described in greater detail in Section 2.2.

[9] The State of Alaska has recognized the need to collect employment data for fish harvesters, and the FY 2008 budget includes funds to investigate means to collect fish harvesting employment data on an ongoing basis.

additional monthly average of 1,700 to 1,900 processing workers in the at-sea sector. Adding all of these estimates together, the total annual average monthly employment in Alaska's seafood industry has been between 16,000 and 20,000 from 2003 to 2007.

Figure 7. Alaska Seafood Shore-side Processing Annual Average of Monthly Employment, 1980-2007



Note: Annual average employment refers to the average number of monthly jobs over the full calendar year.
Source: Developed by Northern Economics based on data from ADOLWD 2008b.

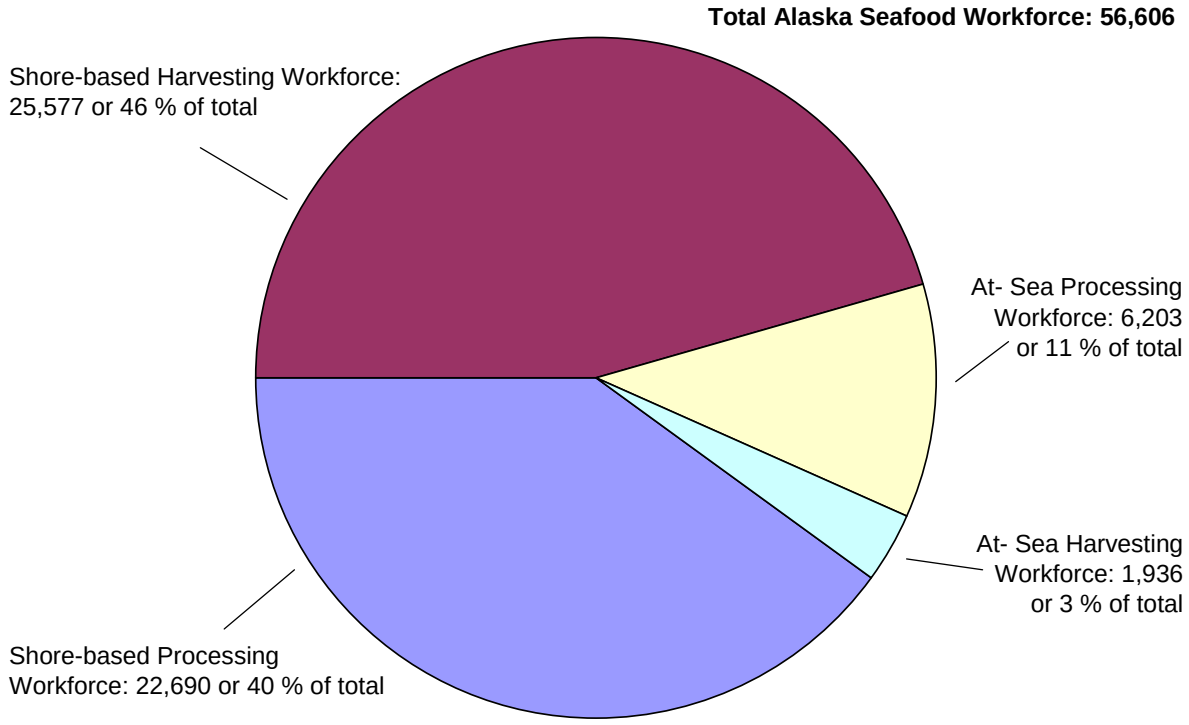
Jobs in the Alaska seafood industry are highly seasonal and in most cases relatively short term. For example, one of the biggest fisheries in the state, the sockeye salmon fishery in Bristol Bay typically lasts for only 45 days with the majority of the activity in a two-week period around July 4th. In 2007 there were 2,328 active permits holders in the fishery. Assuming each permit holder had a crew of two, an estimated 6,984 worker participated in the fishery. In addition, ADOLWD (2008c) estimate there were 4,480 processing workers in Bristol Bay during the peak of the run. In total it is estimated that there were 11,464 individuals employed in the Bristol Bay salmon fishery. Because none of these persons were likely to have been both a harvester and a processor, the workforce in the Bristol Bay sockeye salmon fishery is estimated to be 11,464. However, since most worked no more than 1.5 months, the calculated annual average monthly employment would be 1/6th of this number or 1,911 annual jobs.

Based on the example above, it is clear that the workforce in the Alaska seafood industry is significantly larger than the annual average of monthly employment. Figure 8 shows the estimated workforce in Alaska's seafood industry for 2006.[10] The figure shows estimates for four sectors: Shore-based processing and harvesting, and at-sea processing and harvesting. With the exception of the

[10] At the time publication, workforce estimates for 2007 shore-based processors were unavailable.

workforce for shore-based processing—which relies on monthly data collected quarterly by the ADOLWD, the numbers are estimates developed by Northern Economics using data from CFEC (2008) and Hiatt (2008a). Overall, the size of the Alaska seafood industry workforce is estimated at 56,606 workers. Of these 86 percent worked in shore-based operations. There were a total of 27,713 harvesters and 28,893 processors.

Figure 8. Estimated Workforce in the Alaska Seafood Industry, 2006

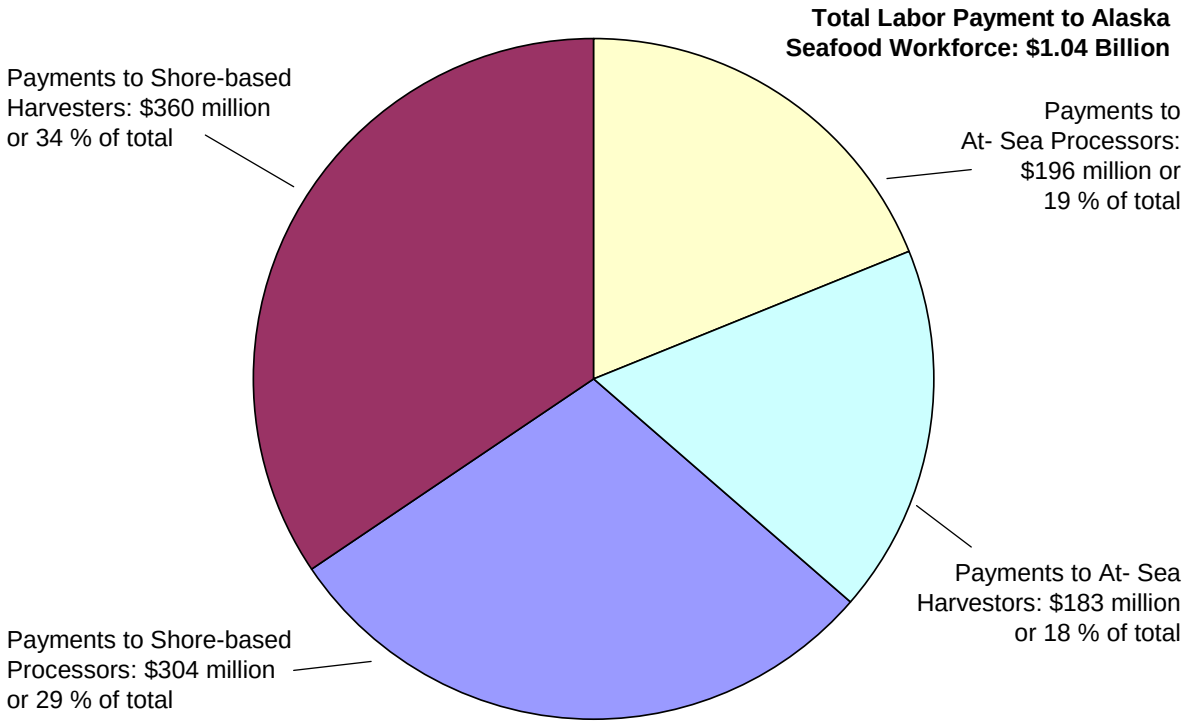


Source: Estimated by Northern Economics using from ADOLWD (2008a), CFEC (2008), and Hiatt (2008a)

This document refers to the earnings of processors and harvesters as payments to labor. As with employment and workforce, official data on payments to labor in the seafood industry are incomplete. Because shore-based processing workers are "regular" employees whose employers pay unemployment taxes, monthly data on payments to labor for shore-based processors are collected on a quarterly basis by ADOLWD. As discussed earlier, data for shore-based harvesters and both harvesters and processors on at-sea processing operations are not collected on a regular and formal basis, and therefore payments to labor for these components of the seafood industry must be estimated on an *ad hoc* basis, using information from the industry source on the share of either ex-vessel or wholesale value that is typically paid to workers.

Figure 9 shows the estimated payment to labor in the Alaska seafood industry for 2007. Overall it is estimated that workers earned a total of $1.04 billion from the harvesting and processing efforts. Of this, harvesters (shore-based and at-sea combined) received $543 million or 52 percent of the total, while processing workers were estimated to have been paid $501 million or 48 percent of the total.

Figure 9. Estimated Payments to Labor in the Alaska Seafood Industry, 2007



Source: Estimated by Northern Economics using data from ADOLWD (2008b) and Hiatt (2008a)

2.2 Historical Overview of the Salmon Fishery

Five types of salmon (chinook, coho, sockeye, pink, and chum) are harvested commercially in Alaska waters. These species have been the basis for one of Alaska's most important industries for nearly 130 years, with the first salmon canneries being built in Alaska in 1878 (Woodby et al. 2005; NMFS 2004). With the rising demand and depleted runs along the U.S. West Coast, American business operators were quick to recognize the value of Alaska salmon, and the technology of canning allowed them to preserve the fish in large quantities for transport by ship to markets in the United States and Europe (Sisk 2007). By 1890, large corporate salmon canneries, owned primarily by West Coast-based companies, began to appear in Alaska, and the salmon catch grew rapidly with the expansion of cannery capacity (Alaska State Library 2006; Colt 2000).[11] The salmon industry soon dominated Alaska's economy—by the 1920s, a tax on each case of salmon packed in the Territory accounted for 70 percent of general fund revenue (Fried 1996).[12]

The federal government had jurisdiction over the Alaska salmon fisheries, but management was weak, poorly funded and ineffectively enforced (Woodby et al. 2005). About half of the salmon catch was taken in a relatively small number of large and very efficient fish traps that were directly owned by the processors (Kruse et al. 2000). After reaching record high harvest levels of over 100 million salmon

[11] Manpower and materials were scarce, and each spring the companies would ship to Alaska all the cans and other production inputs needed for the salmon packing season—even about 75 percent of the workforce was imported (Fried 1996; Tremaine 1989).

[12] In 1913, the First Territorial Legislature adopted the "salmon pack" tax which applied to salmon canneries based on canned salmon (7¢ per case) (ADOR 2006a)

caught annually during the 1940s, stocks dropped so low that President Eisenhower declared Alaska a federal disaster area in 1953 (ADF&G 2003a; Heard 2003).

The State of Alaska took management control of its salmon resources from the federal government soon after statehood in 1959.[13] The harvest decline was temporarily arrested after fish traps were outlawed in 1959 and the Alaska Department of Fish and Game (ADF&G), established in 1957, instituted additional conservation measures. However, the entry of other types of technological fishing gear, including larger and more efficient vessels, coincided with further decline to a record low harvest level of 22 million in 1973 (Colt 2000; Heard 2003). This crisis helped promote the enclosure of the salmon fishery in 1973 under a limited entry permit system. The total number of available permits for each fishery became strictly limited, and harvesters were not allowed to own more than one salmon permit for the same gear type and area (ADF&G 2003b).[14]

Another response to the record low wild-stock runs was the development of salmon hatcheries in Alaska.[15] The hatcheries were used to cultivate large numbers of fish in an enclosed environment. The hatchery-produced fish were released into the wild to augment commercial or recreational fishing. During the past decade hatcheries have produced 27 to 63 million adult fish annually, accounting for 14 to 37 percent of the total "wild" statewide commercial salmon harvest (Heard 2003).

Alaska's salmon catches rebounded under the combined effects of management and hatcheries, and by the 1990s, commercial harvests were at or near record levels in many regions of the state. However, during the 1990s rapid and sustained growth in world farmed salmon production fundamentally transformed world salmon markets with respect to total supply, prices, products, timing of production, quality standards and organization of the industry (Knapp et al. 2007). The inflation-adjusted ex-vessel value of annual Alaska salmon catches dropped from more than $800 million in the late 1980s to less than $300 million for the 2000-2004 period. Most of this decline in value was due to a decline in prices (rather than catches), and much of the decline in prices was due to competition from farmed salmon (Knapp et al. 2007).

The economic condition of the salmon fisheries has shown some improvement in recent years. The 2007 salmon harvest value was more than double the 2002 figure (Figure 3). This increase was a combination of a large harvest of over 221 million salmon, the largest commercial harvest in history and modest increases in salmon prices, particularly for sockeye salmon (AGF&G undated). With the increase in harvests and prices there has been a gradual increase in the value of Alaska salmon permits, particularly those for the Bristol Bay sockeye fishery, although permit prices are still a fraction of what they were in the 1980s (Welch 2007a).

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[13] Alaska was the only U.S. territory never to exercise control over its fishery resources (Gilbertsen 2004). Acquiring control of salmon fisheries was a primary incentive of the statehood movement (Woodby et al. 2005). Alaska is the only state with a constitutional mandate that requires sustainability of its fish and wildlife resources—Article 8 of the State of Alaska Constitution reads: "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses."

[14] Gilbertsen (2004:4) notes that the limited entry program was intended to transfer economic benefits from out-of-state processors to Alaska fishermen as well as regulate fishing effort: "the limited entry program… conveyed the right of fishery access to the gear operator rather than to the vessel owner. This provision ultimately resulted in salmon canneries' divesting themselves of their corporate owned fishing fleets, and provided fishermen increased bargaining power."

[15] Salmon hatcheries have existed in Alaska as far back as the late 1800s, but the success of these early facilities was limited. The federal government started several research stations as well as territorial hatcheries in the 1930s and 1950s. Hatchery production increased when enhancement planning in the early to mid-1970s called for significant capital construction under a newly formed division (Fisheries Rehabilitation, Enhancement and Development Division) within ADF&G (Kruse et al. 2000).

2.3 Historical Overview of the Herring Fishery

One of Alaska's oldest commercial fisheries, the herring industry began in Alaska in 1878 (Woodby et al. 2005). Salted and pickled herring production peaked after World War I, when about 12,700 mt were harvested annually. During the 1920s, herring became increasingly valued for oil and meal. Reduction plants to "reduce" herring to meal and oil sprang up along the Gulf of Alaska from Craig to Kodiak. When harvests in the 1920s and 1930s reached as high as 113,400 mt stocks began to decline. Moreover, during the 1950s, lower cost Peruvian anchoveta severely impacted the oil and meal markets. The last Alaska herring reduction plant closed in 1966 (Woodby et al. 2005).

A Japanese and Russian trawl fishery for herring began in the Bering Sea in the late 1950s, reaching a peak harvest of 146,000 mt in 1970. Japanese longliners also fished for herring with gillnets in the 1960s and early '70s near Togiak and Hagemeister Strait. These high harvests were likely not sustainable and the foreign fishery declined until it was phased out following the establishment of the 200-mile Fishery Conservation Zone in 1976 (Woodby et al. 2005).

When Japan's herring stocks declined during the 1960s, the Japanese fishing fleet began importing herring roe from other countries. A lucrative market for herring eggs and eggs on kelp prompted the development of Alaska's roe herring fisheries. When inshore domestic fisheries began to fully utilize Bering Sea herring around 1980, foreign harvests were eliminated, but roe (harvested as sac roe or spawn-on-kelp) remained the principle utilization of herring (ADF&G 2006c).

In recent years, herring roe markets have begun to deteriorate as the consumption of salted herring roe declines in Japan. Mainly because of lower prices, the average value of Alaska herring catches has fallen dramatically. By way of comparison, total herring harvest values (in real dollars) in the early 1990s exceeded $35 million; during the 2001-2005 period, total ex-vessel value averaged about $12 million (Figure 3). With the weak market and lower prices, participation in herring fisheries has also been declining (ADF&G 2007e). In response to the falling demand, herring processors have been increasingly concerned about product quality. Harvesters, ADF&G, and the seafood processing sector have renewed efforts to increase roe percentages and reduce the length of time herring are held before processing (ADF&G 2006c). While the herring fishery is much smaller in terms of value than the other Alaska fisheries, it continues to be an important source of supplementary income for participants in other fisheries.

The commercial catch of herring for bait in Alaska began around 1900 and remained relatively stable, typically 1,800–2,700 mt per year, in spite of large fluctuations in the herring catch for the reduction, foreign, and sac roe fisheries. The development of extensive crab fisheries in the 1970s greatly increased the demand for herring bait (Woodby et al. 2005).

2.4 Historical Overview of the Halibut Fishery

In the 1880s, a commercial fishery began for Pacific halibut in the inside waters of Southeast Alaska, with sablefish targeted as a secondary fishery (Woodby et al. 2005). The first shipment of fresh halibut was sent south from Juneau in 1897 (Alaska State Library 2006). The market demand for halibut grew as the development of ice makers enabled harvesters to preserve the halibut long enough to make it available to markets throughout the United States (NMFS 2004). Most of the halibut fishing in Alaska waters was conducted by halibut schooners built in Seattle and based in that port (Federal Fisheries Investment Task Force 1999).

Concerns about the increasing amounts of gear and decreasing catch per unit of gear in the Pacific halibut fishery from northern California through Alaska led Canada and the United Stares to negotiate

the Convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean in 1923.[16] The treaty established a bilateral commission (later named the International Pacific Halibut Commission or IPHC) that was granted regulatory powers (IPHC undated).

In 1995, an IFQ program was established for the fixed gear halibut fishery in both the GOA and BSAI, whereby harvest quota shares are allocated to individuals or companies within separate IPHC regulatory areas and for specific vessel size classes. The extended fishing made possible by the IFQ system has allowed harvesters to increase their production of higher-value fresh fish and time their catch to receive the best prices (Hartley and Fina 2001). As shown in Figure 3, the halibut fishery increased in ex-vessel value after it changed from a derby fishery to an IFQ fishery and delivery patterns shifted. The average 2006 dockside price paid to commercial halibut fishermen was $3.71 per pound, up $0.70 cents from 2005 and almost a dollar from 2004 (ADCCED 2007). The high prices in most major Alaska ports took the halibut harvest to its highest ex-vessel value on record (Figure 3). The strong market for halibut has also resulted in record-high halibut quota share prices (Welch 2007a).

2.5 Historical Overview of the Crab Fishery

The history of crab fisheries in Alaska waters extends back to 1930, but substantial domestic commercial efforts were not undertaken until the 1950s when the king crab fisheries began to develop in the Bering Sea (Woodby et al. 2005).[17] King crab are Alaska's most valuable crab per pound and are generally sold at the highest prices of any crabs in U.S. fisheries (NMFS and NPFMC 2004). Commercial fishing for red king crab in the Bering Sea started with Japanese harvests in 1930 (Bowers et al. 2005). Canned crab was popular in the U.S. in the pre-World War II years; the U.S. imported about ten million pounds per year (NMFS and NPFMC 2004). The Japanese fishery ended in 1940 with the onset of World War II, but resumed in Bristol Bay from 1953 until 1974. The Russian fleet also fished for red king crab in Bristol Bay from 1959 through 1971. U.S. harvesters entered the eastern Bering Sea fishery with trawl gear in 1947. The domestic fishery in Bristol Bay expanded to full-scale in the late 1970s and peaked in 1980 with a catch of 59,000 mt, worth an estimated $115.3 million in nominal dollars.[18] Since 1980, king crab stocks throughout Alaska, including Bristol Bay, have declined sharply and show no signs of recovering to pre-1980 levels (Bowers et al. 2005).

Since the early 1980s, the Bering Sea snow (*Chionoecetes opilio*) crab fishery has been the largest shellfish fishery in Alaska. Snow crab was harvested in the Bering Sea by the Japanese from the 1960s until 1980 when foreign fishing was prohibited (Turnock and Rugolo 2007). The first domestic commercial landings of snow crab from the Bering Sea were recorded in 1977, incidental to the

[16] The treaty of 1923 was especially noteworthy in that it was the first international treaty to be concluded for the conservation of a depleted deep-sea fishery (IPHC undated).

[17] The domestic deepwater crab fisheries developed later than some other Alaska fisheries because of their distance from markets and their capital requirements: large vessels, expensive gear and sophisticated freezing equipment or live-holding tanks (NMFS and NPFMC 2004).

[18] Different king crab fishery areas in Alaska have seen different peaks and declines. The domestic fishery was concentrated at first in the eastern Bering Sea but shifted to the Kodiak area in 1954. During the 1960s, the Kodiak area was a major producer of king crab with a peak in 1965 of 43,180 mt., close to 70 percent of the total domestic Alaska king crab harvest. This record high harvest was followed by a precipitous decline in the late 1960s. The Kodiak fishery continued at low levels until 1982 when the fishery was closed. It has remained closed ever since. Following the collapse of the Kodiak fishery in the late 1960s, fishing effort migrated into the Bristol Bay king crab fishery and Bering Sea Tanner crab fishery (NMFS and NPFMC 2004).

harvest of Tanner (*C. bairdi*) crab.[19] In 1981, a reduction in the Tanner crab harvest resulted in increased snow crab harvest (Bowers et al. 2005). Retained catch in the domestic fishery increased in the late 1980s to a high of about 149,073 mt in 1991 (Turnock and Rugolo 2007). Ex-vessel value increased from $8 million in 1984 to a peak in 1994 of nearly $200 million in nominal dollars. In just 15 years, snow crab, which was earlier considered of no commercial value, became the most valuable commercial crab fishery in the United States and the new economic foundation of the Alaska crab fleet (Herrmann and Greenberg 2006).[20] However, the catch declined to 29,500 mt in 1996, increased to 110,400 mt in 1998, then declined to 15,200 mt in the 2000 fishery. Due largely to the precipitous drop in Bering Sea snow crab landings in 2000, the ex-vessel value of Alaska's shellfish harvest fell by half despite a substantial increase in crab prices (Figure 3). As a result of low abundance and a reduced harvest rate, snow crab catches have remained low and were 11,800 mt in the 2005 fishery and 16,800 mt in 2006 and 2007 (Turnock and Rugolo 2007). In summary, commercial harvests in all major crab fisheries in Alaska have fluctuated over the years perhaps due to overfishing and environmental causes. Some crab stocks have collapsed and shown no signs of recovery (e.g., Kodiak red king crab), while others have declined to relatively low levels (Kruse et al. 2000).

In August of 2005, fishing in the BSAI crab fisheries began under a new share-based management program (the "Crab Rationalization Program"). The program allocates BSAI crab resources among harvesters, processors and coastal communities. Share allocations to harvesters and processors, together with incentives to participate in crab harvesting cooperatives, are intended to improve safety and conservation, increase efficiencies, provide economic stability and facilitate compensated reduction of excess capacities in the harvesting and processing sectors (Plan Team for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands 2007).

Shrimp once supported large and historically important commercial fisheries in the late 1950s through the early 1980s, particularly in the central and western Gulf of Alaska (Woodby et al. 2005). A beam trawl fishery for northern shrimp began in the Petersburg area in 1915. Alaska's largest shrimp fishery targeted northern shrimp with otter trawls in the Kodiak area beginning in 1958, extending west to the Alaska Peninsula in the Chignik and South Peninsula districts in 1968. Statewide shrimp catches, mainly with trawl gear, averaged 52,200 mt annually at the peak from 1973 to 1977 (ADF&G 2007c). The shrimp populations in the western and central Gulf crashed in the late 1970s and early 1980s, due in part to a climate regime shift (Woodby et al. 2005). Recent commercial harvests are much smaller in volume and are predominantly from Southeast Alaska. Statewide catches averaged 900 mt valued at $4.2 million for the 2000–2004 period (ADF&G 2007c).

The commercial scallop fishery began in Alaska in the Kodiak area in 1967 and the Yakutat area in 1968 (Woodby et al. 2005). The fishery expanded to the Alaska Peninsula in 1975, Southeast Alaska in 1980, Cook Inlet in 1983, the Bering Sea in 1987, and Prince William Sound in 1992. Since the early 1990s, scallop harvests have shown a declining trend. Harvests in the 2001-2005 period averaged 214 mt of shucked meats, with an ex-vessel value of slightly over $2.4 million (ADF&G 2007d). In 2000, six of the licensed scallop vessel owners formed a voluntary, self-regulatory fishing cooperative, allocating harvest shares based on prior fishing history (Woodby et al. 2005).

[19] Prior to the early 1970s, harvest of Tanner crabs from the Bering Sea was, in general, incidental to the directed red king crab fishery in that area. Development of the fishery was slow due to a number of reasons, the most important being low consumer acceptance. As market conditions improved, a directed fishery began in 1974, and commercial harvest reached a high of about 30,232 mt during the 1977/1978 season. However, by 1985 catches had fallen to 1,430 mt., and further stock declines led to a fishery closure during the 1986 and 1987 seasons. Since then, commercial harvest of Tanner crabs in the Bering Sea has occurred at relatively low levels and with periodic closures (Kruse et al. 2000; NMFS and NPFMC 2004).

[20] The success of the snow crab fishery was due in part to the development of new markets in Japan and the United States, including the domestic "all you can eat" seafood buffet restaurants (Gay 1992).

2.6 Historical Overview of the Groundfish[21]

Among Alaska's commercial fisheries, the groundfish fishery has targeted the greatest diversity of species, including pollock, Pacific cod, sablefish, Atka mackerel, lingcod and numerous rockfish and flatfish species (ADF&G 2006a). The majority of groundfish are harvested in federal waters.

A robust foreign groundfish fishery operated off Alaska prior to WWII and then picked up after the war to record levels in the 1960s and '70s, long before a modern domestic fishery developed. An American sail and dory Pacific cod fishery operated in Alaska waters near Unimak Pass and the Shumagin Islands from May 1, 1865 till the 1950s (Shields 2001). Harvests in Bering Sea foreign groundfish fisheries reached a record 2.2 million metric tons (mt) in 1972, but thereafter catches dropped sharply (ADF&G 2006b). In general, the period of foreign fishing is characterized by unregulated overfishing of groundfish resources off Alaska and gear conflicts between foreign trawl fisheries and domestic pot fisheries for crab and longliner fisheries for halibut.

Establishment of the 200-mile Fishery Conservation Zone (later called the U.S. Exclusive Economic Zone or EEZ) in 1976 was followed by a variety of federal laws and programs developed to promote the "Americanization" of fisheries inside the U.S. EEZ, especially the rich groundfish resources of the Bering Sea.[22] The "Americanization" process began in the late 1970s and early 1980s with the advent of the "Fish-and-Chips" policy and enactment of the American Fisheries Promotion Act. These strategies increased the number of criteria upon which foreign fishing privileges in the U.S. EEZ were based to include the removal of trade barriers, the commitment to purchase the products of the U.S. seafood industry, the minimization of gear conflicts, and the transfer of fishing and processing technology. A parallel program sponsored by NMFS, the Fisheries Obligation Guarantee Program, guaranteed over $150 million worth of loans between 1977 and 1996 for the construction of U.S. factory trawlers and stationary floating processors. The financial assistance offered under the program was extended to U.S. shore-side processing plants in 1983.

Under these incentives, the Alaska groundfish fishery moved from almost entirely foreign to joint ventures to a completely domestic fishery in 1991. U.S. harvests were minimal in 1980 compared to salmon and crab, accounting for less than 6,000 of the 262,000 mt harvested in the domestic Alaska fisheries. The value of these harvests represented only around 0.2 percent of the total value of domestic fisheries in Alaska. By 1991, the amount of groundfish handled by domestic processors was nearly ten times greater than the amount of salmon, crab, halibut, and other species combined, and accounted for about 39 percent of the ex-vessel value of all Alaska fishery resources. Since 2001, groundfish has accounted for over half of the total ex-vessel value (Figure 3).

While the fishery management and development policies for the Bering Sea/Aleutian Islands (BSAI) and GOA groundfish fisheries have resulted in high levels of catch, revenues, and employment, the race for fish as a principal mechanism for managing the groundfish quotas and prohibited species catch limits among competing fishing operations has adversely affected at least some aspects of the economic performance of the fisheries. The individual fishing quota (IFQ) program for the fixed gear sablefish and halibut fisheries, the Community Development Quota (CDQ) program for BSAI groundfish, the American Fisheries Act (AFA) cooperatives for the BSAI pollock fishery, and newly implemented crab rationalization program, and GOA Rockfish Pilot Program have all demonstrated that eliminating the race for fish and replacing it with a market-based system can reduce excess fishing capacity, decrease harvesting and processing costs and increase the value of the groundfish catch.

[21] All the information presented in this section is from NMFS (2004) unless cited otherwise.

[22] Beginning with the Presidential Proclamation of a U.S. EEZ in 1983, and culminating in 1986 with PL 99-659, the EEZ superseded the Fisheries Conservation Zone as the coastal area within which the United States exerts the right to control marine fishing activity.

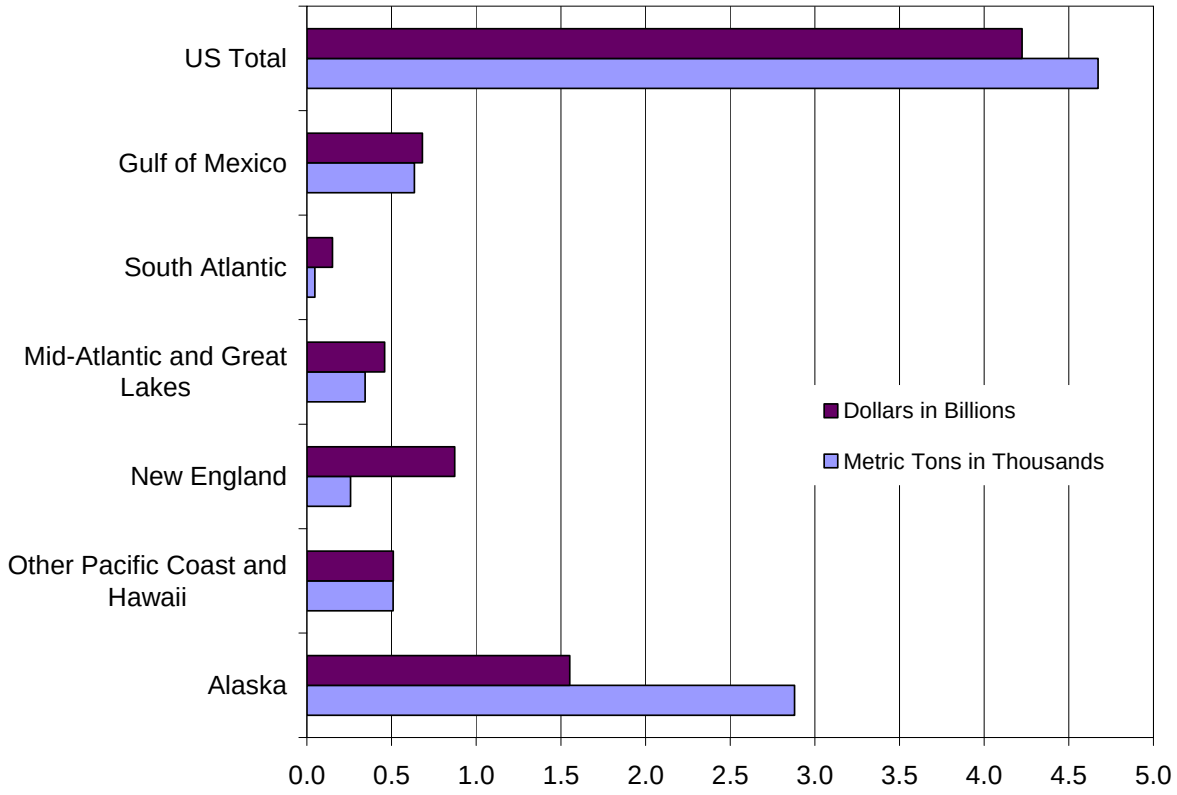
3 Alaska's Seafood Industry in the U.S. and Global Markets

The purpose of this chapter is to demonstrate the importance of Alaska's seafood industry in the U.S. and global seafood industries in terms of volume and value of landings.

3.1 National Importance of Alaska Seafood Industry

In 2007, Alaska led all regions in seafood harvest volume, with landings of 2.88 million mt (Hiatt, 2008a), followed by the Gulf of Mexico with 0.63 million mt (NMFS 2008). Alaska also led all regions in ex-vessel value, with $1.55 billion,[23] followed by the New England Region with $872 million and the Gulf of Mexico with $681 million. Figure 10 shows seafood product and ex-vessel value by region as well as total US volume and value.

Figure 10. Comparison of Alaska and US Volume and Ex-Vessel Value of Commercial Fishery Landings, 2007



Source: Developed by Northern Economics based on data from Hiatt (2008b) and NMFS (2008b).

All of Alaska fisheries combined accounted for 62 percent of the volume and 37 percent of the ex-vessel value of the commercial seafood harvested in the United States as reported in NMFS (2008a). The groundfish fishery off Alaska is an especially important segment of the U.S. fishing industry. With landings of 2.4 million mt in 2007, Alaska groundfish accounted 51 percent of U.S. commercial fishery landings by volume.

[23] Includes an imputed $310 million in ex-vessel value from harvests of catcher processors.

As discussed earlier, pollock is the most dominant species in the commercial groundfish catch off Alaska. With the exception of *de minimus* harvests off of the coast of Washington, all of the pollock landed in the United States is harvested in the fishery off the coast of Alaska. This fishery is the largest U.S. fishery by volume, accounting for more than one-third of total U.S. fisheries landings (Knapp 2006a). Pacific cod is the second most dominant groundfish species harvested off Alaska. Pacific cod now accounts for more than 95 percent of the U.S. domestic cod harvest, and more than 99 percent of this harvest is from Alaska waters (Knapp 2006b). The yellowfin sole and rock sole fisheries off Alaska are the largest flatfish fisheries in the United States. The two flatfish species account for approximately half of U.S. flatfish landings from the Pacific and Atlantic Oceans combined. Yellowfin sole is landed only in Alaska, and rock sole almost entirely so (West Coast landings comprise less than one percent of total U.S. landings for the species) (Roberts and Stevens 2006). Alaska landings accounted for 71 percent of the commercial sablefish catch in 2006 (NMFS 2007b).

With respect to non-groundfish species, Alaska accounted for 96 percent of total U.S. commercial landings of salmon in 2006 (NMFS 2007b). The BSAI and GOA together produce approximately one-third or more of total U.S. crab catches on average (Woodby et al. 2005). U.S. domestic production of king, Tanner and snow crab comes entirely from Alaska (ADF&G 2007b). Alaska landings accounted for 97 percent of the U.S. Pacific sea herring harvest and nearly all of the commercial halibut catch in 2006 (NMFS 2007b).

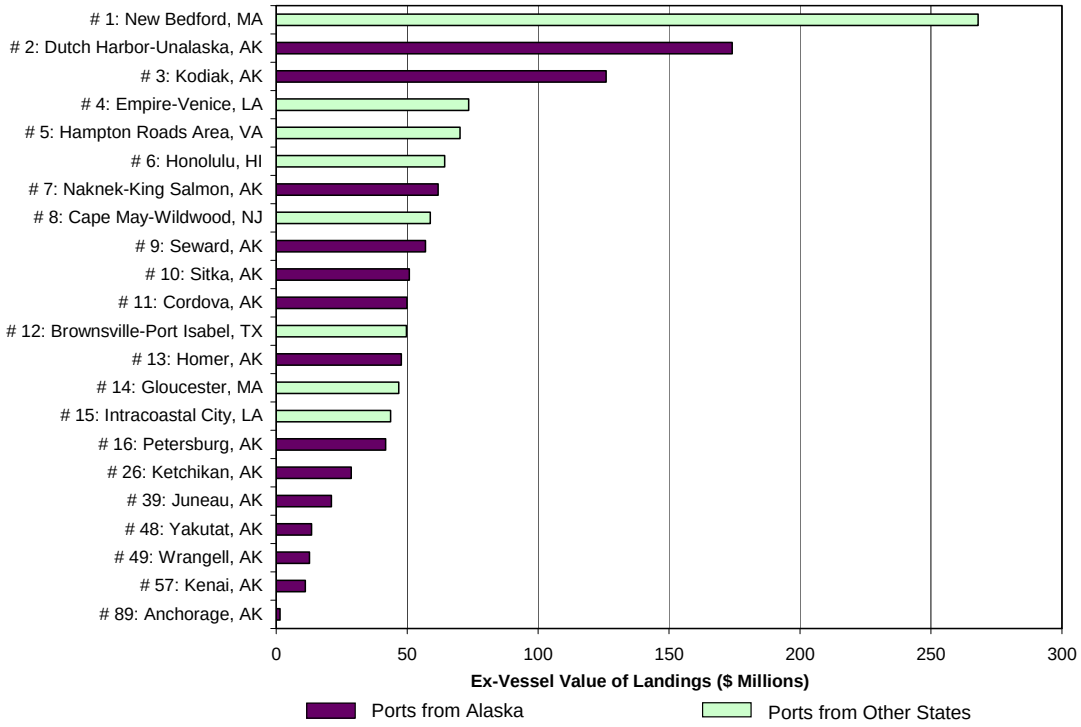
Since 1997, Dutch Harbor-Unalaska has been the leading U.S. fishing port in quantity of commercial fishery landings. [24] In 2006, the port had record landings for quantity at a U.S. port, with more than 414,200 mt of fish and shellfish landed (NMFS 2007b).[25] In 2007, Alaska had two of the country's three top fishing ports ranked by total harvest value.[26] Dutch Harbor-Unalaska ranked second in the nation (after New Bedford, Massachusetts) with a harvest value of $174 million; Kodiak remained in third place with nearly $1,216 million in seafood. Twelve other Alaska ports are ranked in the top 100 among US Ports by value as shown in Figure 11 and include six more in the top 20: Naknek-King Salmon (#7), Seward (#9), Sitka (#10) Cordova (#11), Homer (#13), Petersburg (#16).

[24] To protect the confidentiality of proprietary data, NMFS (2007b) does not include certain leading ports. The ports of Akutan, King Cove and Sand Point are typically not listed among the top U.S. ports because each has only one fish processor/buyer; therefore, data regarding total landed weight and value at these ports are confidential. However, the American Fisheries Act of 1998 opened data associated with BSAI pollock fisheries to public scrutiny, and based on Bering Sea pollock data alone, the three communities would all be in the top 50 in terms of landed weight, with Akutan ranking in the top ten.

[25] In 2002, Dutch Harbor-Unalaska surpassed the 32-year volume record of 385,500 mt. held by Los Angeles.

[26] Dutch Harbor-Unalaska was the leading U.S. port ranked by dollar value of landings for eight years, from 1992 through 1999, before being displaced by New Bedford.

Figure 11. Rankings of Selected US Ports by Ex-Vessel Value, 2007



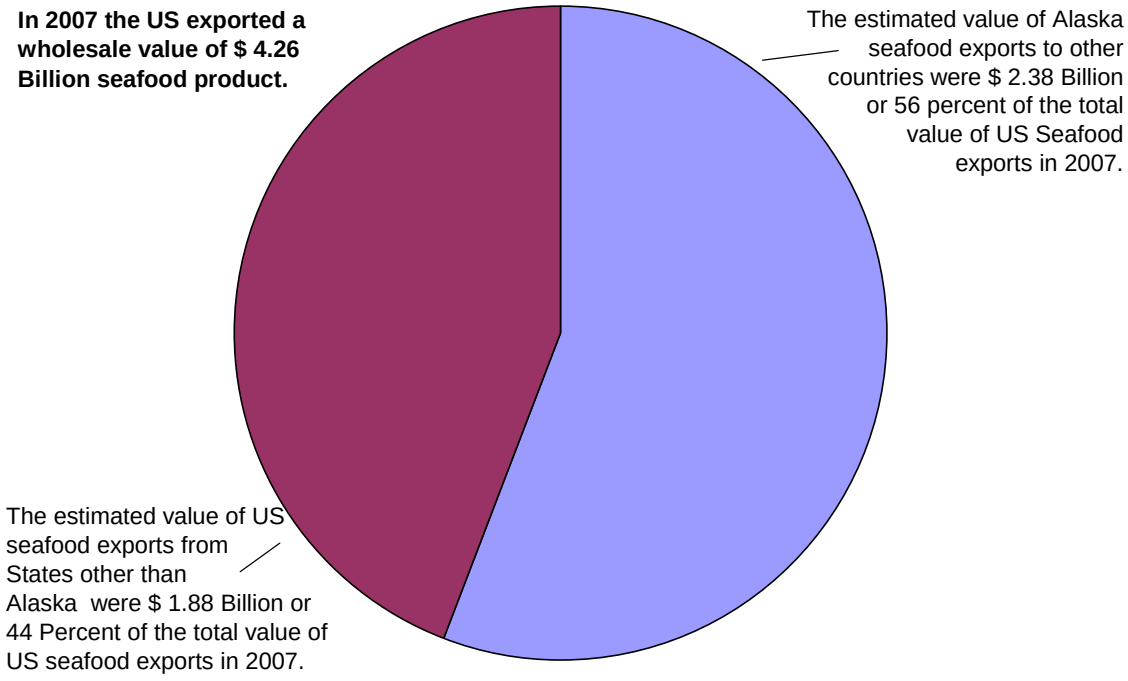
Source: Developed by Northern Economics based on data from NMFS (2008c).

Alaska is also one of the primary sources of US exports of seafood product. As shown in Figure 12, it is estimated that Alaska exported seafood worth $2.38 billion in wholesale value in 2007[27]. This was 56 percent of the total export value of US seafood product (NMFS, 2008b). The export value of seafood from all other states combine was only 44 percent of the total.

As shown in Figure 13, Japan China, and South Korea were the three leading importers of Alaska seafood products in 2007. Germany, the Netherlands and other countries in Europe have become increasingly more important for exporters of Alaska Seafood. For fisheries outside of Alaska, the leading importer is Canada.

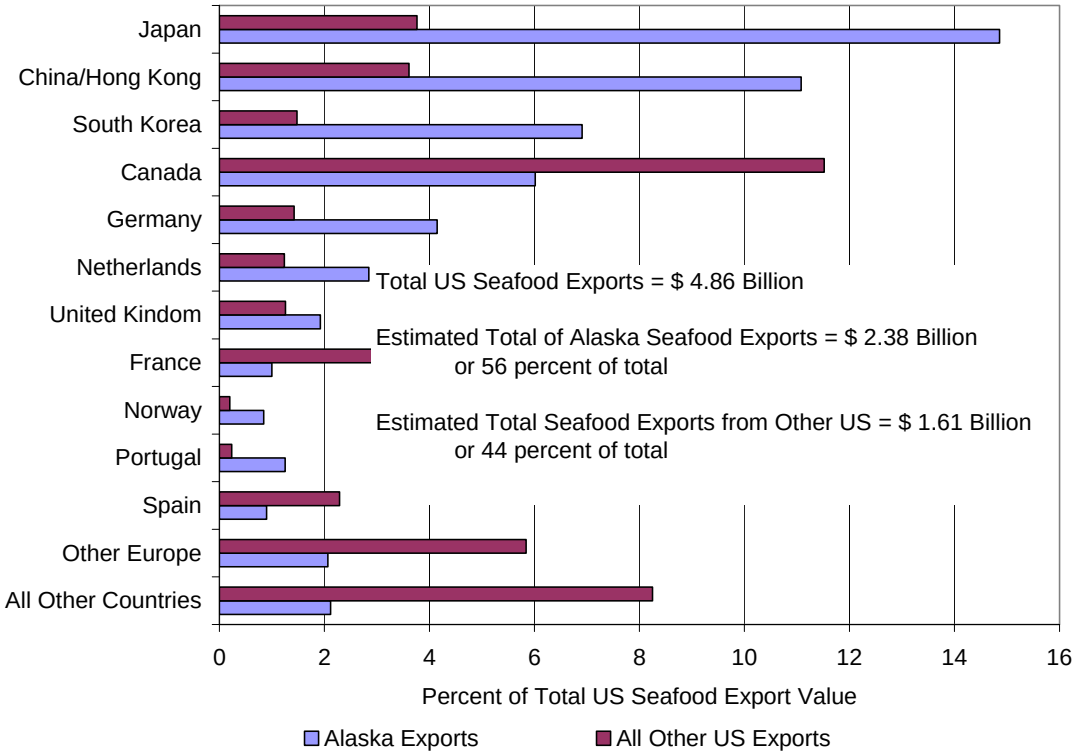
[27] Estimates of the value of exports from a particular state or region are somewhat imprecise because export data are reported by species, product, and the US Customs District from which the fish was exported. Because Seattle is a major export port for Alaska seafood, the possibility exists that some of the amounts attributed to Alaska may have originated from other fisheries, particularly were similar species and products are produced in different fisheries served by the same export district.

Figure 12. Alaska Seafood Exports as a Percent of Total US Seafood Export Value, 2007



Source: Developed by Northern Economics based on data from NMFS (2008b).

Figure 13. Primary Destinations of Alaska and Other US Seafood Exports, 2007

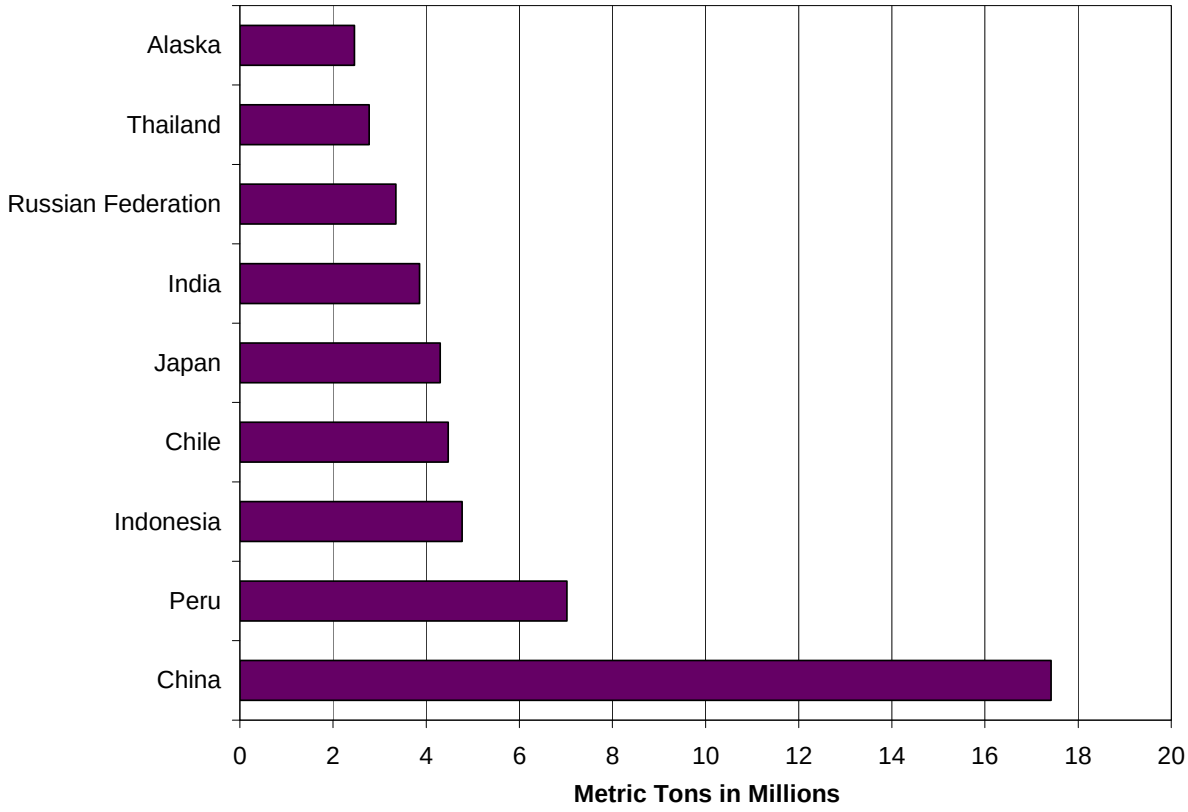


Source: Developed by Northern Economics based on data from NMFS (2008c).

3.2 International Importance of Alaska Seafood Industry

As described in the previous section, exports of Alaska enter markets around the world. Because seafood is one of the most internationally traded products in the world, it is also of interest to examine the Alaska seafood industry in the larger context of worldwide capture fish production. As shown in Figure 14, if Alaska were a nation, it would have placed 9th among seafood producing countries in 2006. (Hiatt, 2008a and FAO, 2008).

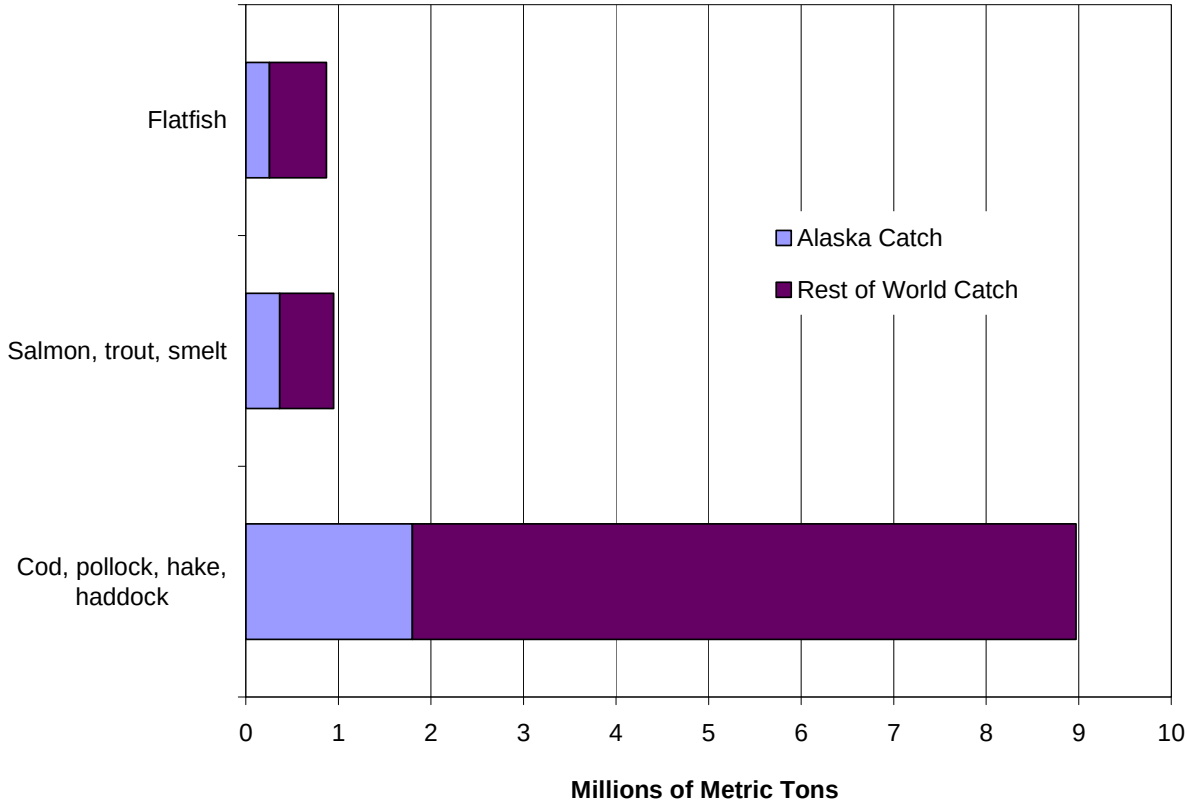
Figure 14. Top World Capture (Wild) Seafood Producers by Country plus Alaska, 2006



Note: Global harvest data for 2007 were not available at the time this report was prepared.
Source: Developed by Northern Economics based on data from Hiatt (2008a) and FAO (2008).

The global importance of Alaska fisheries increases if one focuses on the landings of certain species or species groups. The groundfish fishery in the waters off Alaska is among the largest fisheries from a global perspective. As shown in Figure 15, Alaska landings of traditional groundfish species (including cod, pollock, hake and haddock) and flatfish accounted for about one-fifth of the world harvest of these species groups in 2006. In the same year, around 42 percent of the world capture production of species in the "salmon, trout, smelt" group occurred in Alaska waters. Alaska is the top producer of wild, high-value salmon, producing nearly 80 percent of the world supply of wild king, sockeye and coho (ADF&G 2003b).

Figure 15. Comparison of Alaska and International Volume of Commercial Fishery Landings by Species Group, 2006



Source: Developed by Northern Economics based on data from Hiatt (2008a), CFEC (2008), and FAO (2008).

4 Current Role of the Seafood Industry in Alaska's Economy

This chapter demonstrates the economic importance of the seafood industry in the State of Alaska as a whole. Economic effects are measured in terms of the total employment and income generated, ex-vessel value and first wholesale value of commercial landings, amount of taxes and fees paid, and total output. In addition, the analysis differentiates the economic impacts by region, residency, fisheries jurisdiction and major species or species group. In general, information from 2007 is described. However, 2007 data on workforces and residency were not available at the time of this publication; therefore information for 2006 is reported.

This chapter also examines the economic effects of two commercial fisheries–related areas of interest: 1) in-state expenditures for commercial fisheries management and research by state and federal agencies and 2) the Community Development Quota Program, a federal fisheries program established in 1992 with the goal of promoting fisheries-related economic development in western Alaska

4.1 Statewide Economic Impacts

The total ex-vessel value of Alaska's commercial fish and shellfish harvest was $1.55 billion in 2007. The value added by Alaska's seafood processing sector brought the total value of Alaska's commercial landings to over $3.63 billion in 2007 (Hiatt 2008a).

In 2006, an estimated 56,606 individuals worked in Alaska's seafood industry. Of that total number of workers, about half (27,713) were employed in the seafood harvesting sector and half (28,893) had jobs in the seafood processing sector (ADOLWD, 2007d and Hiatt, 2008a).

The above employment estimates include individuals working in the at-sea processing sector. ADOLWD does not collect complete employment data for this sector because they do not submit (nor are they required to submit) standard employment forms (ES-202) to the agency. To account for these additional workers, Northern Economics collected crew capacity estimates for catcher processors; these estimates suggest that the at-sea processing sector creates about 3,102 processing jobs and 968 harvesting jobs. Counts of jobs are not directly comparable to counts of workers because employee turnover is not factored in. Based on discussions with seafood industry representatives, it was assumed that each processing and harvesting job in the at-sea sector is filled twice per year.

The direct employment generated by the seafood industry creates income in the form of wages and salaries in the processing sector and crew and skipper shares in the harvesting sector. Data from ADOLWD only include gross earnings of the seafood harvesting workforce. Gross earnings are not directly comparable to wages because fishing expenses, such as fuel and oil, bait, ice, and food and stores, have not been deducted. Therefore, the income of harvesters was estimated using a rule of thumb previously developed by Northern Economics based on discussions with seafood industry representatives—in most cases payments to harvesting labor were assumed to be 35 percent of ex-vessel value[28]. Payments to harvesting and processing labor for the at-sea sector are based on the assumption that employees receive 25 percent of the first wholesale value. Within the total paid to all at-sea employees, it is assumed that members of the harvesting crews receive 35 percent of an imputed ex-vessel value, had the fish been caught and harvested by independent catcher vessels.

[28] This is an across-the-board average that represents all fisheries as a whole.

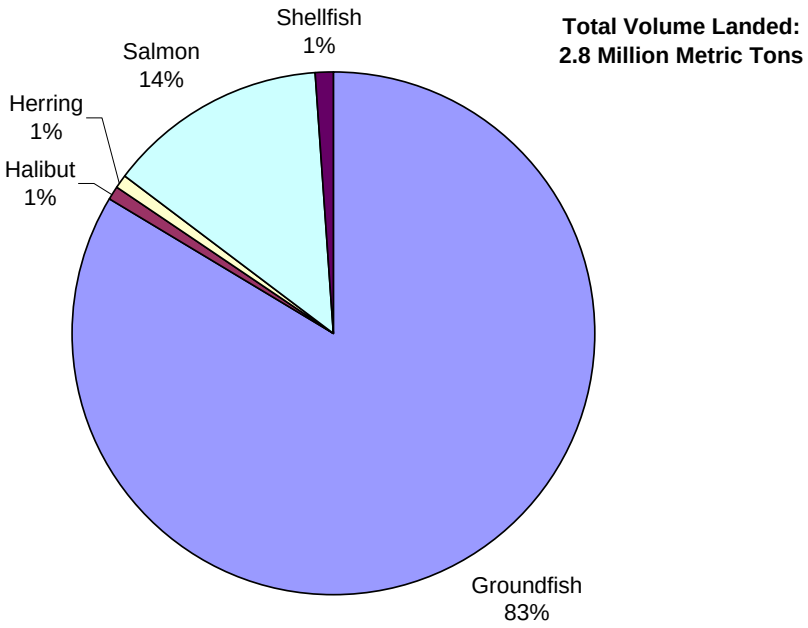
The total payments to labor by the seafood industry in 2007 were estimated to be $1.04 billion. Of that total, and $500 million (48 percent) were estimated to have been paid to the workers in the processing sector, and $543 million (52 percent) were paid to workers in the harvesting sector.[29]

4.2 Economic Impacts by Major Species

This section breaks down the economic impacts of Alaska's seafood industry in 2007 by major species or species group landed and processed in the state—primarily crab and other shellfish, flatfish, halibut, herring, Pacific cod, pollock, other groundfish (including Atka mackerel, rock fish, sablefish, and miscellaneous groundfish) and salmon.

In 2007, Alaska's fisheries landed a total of 2.8 million metric tons of seafood. Figure 16 shows that more than 83 percent of the seafood landed was groundfish, while 14 percent landed was salmon.

Figure 16. Percentage of Volume Landed by Species, 2007



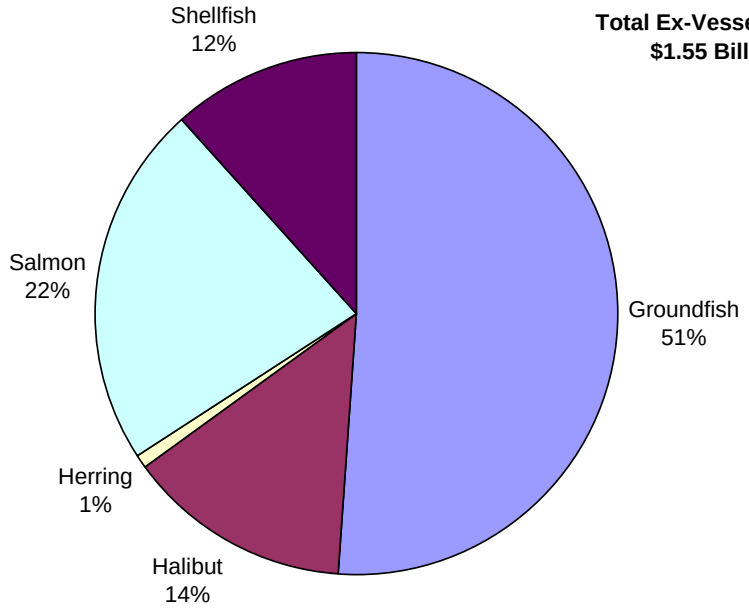
Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.2.1 Ex-vessel Value

Figure 17 shows the distribution of the total ex-vessel value of $1.55 billion in 2007 by major species, including an imputed value for fish harvested by catcher processors. Salmon generates more harvesting jobs than any other fishery, but in terms of both volume and value, the state's largest fishery is groundfish, where a relatively small number of large boats catch huge quantities of fish, predominantly pollock, without requiring proportionate increases in manpower (Robinson and Gilbertsen 2006). In 2007, groundfish fisheries accounted for about 51 percent of the overall ex-vessel value of Alaska's commercial fisheries, while salmon fisheries accounted for about 22 percent.

[29] Estimated by Northern Economics using data from ADOLWD (2008a), CFEC (2008), and Hiatt (2008a).

Figure 17. Percentage of Ex-vessel Value of Alaska Seafood Industry Harvest by Major Species, 2007

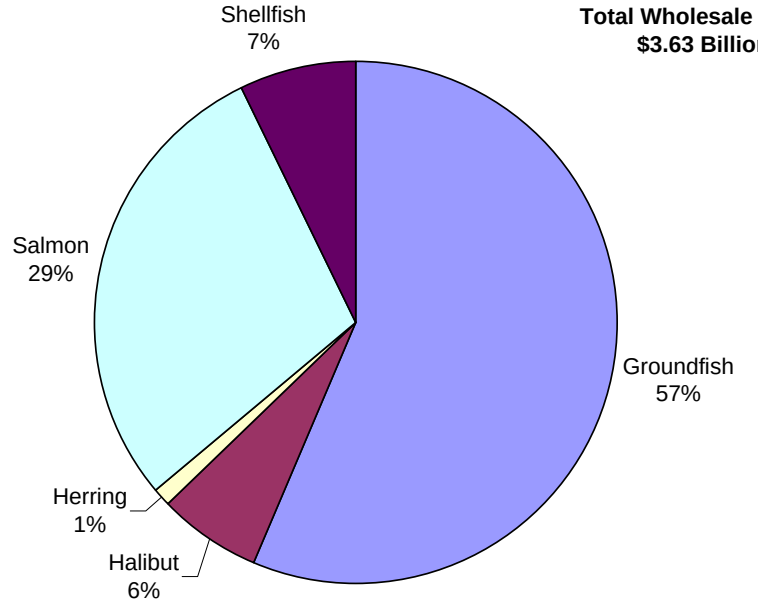


Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.2.2 First Wholesale Value

Groundfish fisheries accounted for around 57 percent of the total first wholesale value of Alaska seafood products in 2007, and salmon fisheries accounted for 29 percent (Figure 18). Species-specific annual estimates of first wholesale value should not be directly compared to estimates of ex-vessel value, because the data are collected by different agencies and wholesale transactions may occur in different years than harvests.

Figure 18. Percentage of First Wholesale Value of Alaska Seafood Industry Harvest by Major Species, 2007

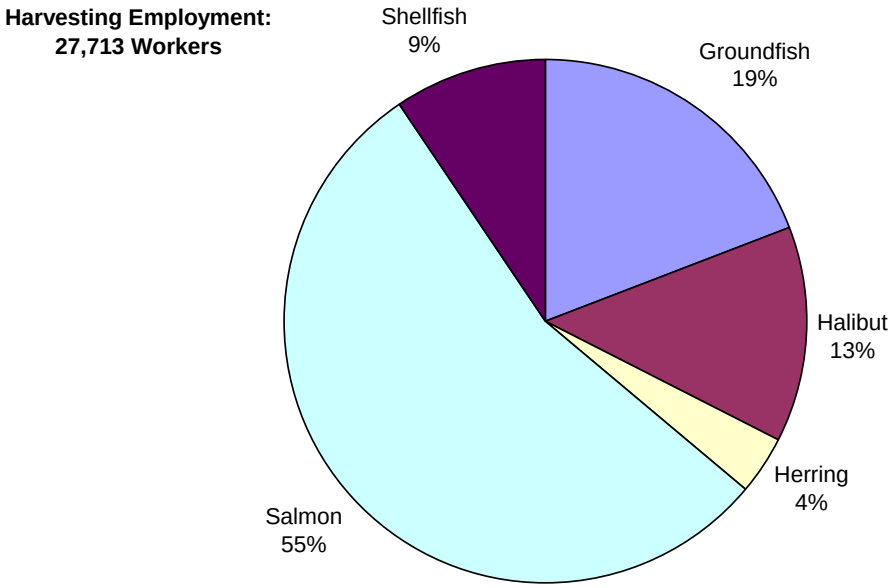


Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.2.3 Employment

Figure 19 shows the estimated harvesting employment associated with each of the major species. Salmon generates more harvesting jobs than any other fishery, accounting for an estimated 55 percent of the harvesting employment in 2006. Groundfish fisheries provided about 19 percent of the total harvesting workforce. Comparable estimates of employment (and payments to labor) by species in the processing sector are unavailable because the large shorebased processing facilities participate in all of Alaska's major fisheries, and workers often switch back and forth between various species.

Figure 19. Percentage of Alaska Seafood Harvesting Workforce by Major Species, 2006

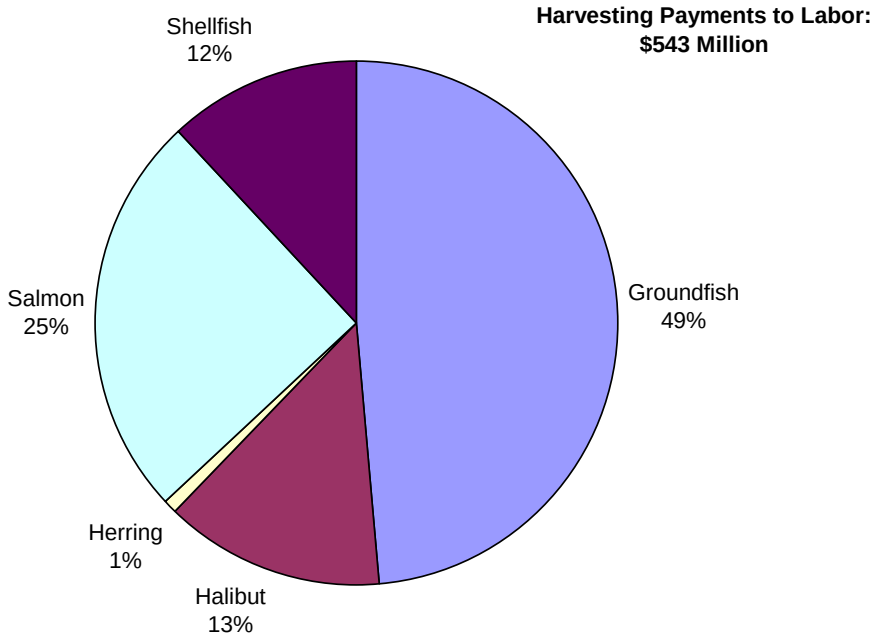


Note: Workforce estimates for 2006 were not available at the time this report was prepared.
Source: Developed by Northern Economics from ADOLWD (2007a) and Hiatt (2008a).

4.2.4 Payments to Labor

Although salmon fisheries provided the most jobs, pollock and other groundfish fisheries generated the greatest amount of payments to labor in 2007 (Figure 20). Groundfish generated 49 percent of payments to labor, while salmon provided 25 percent. As discussed above, it is not possible to estimate payments to labor by species for the processing sector, because workers at large shore plants work on many different species during the course of their employment.

Figure 20. Percentage of Alaska Seafood Harvesting Payments to Labor by Major Species, 2007



Source: Developed by Northern Economics from ADOLWD (2008b) and Hiatt (2008a).

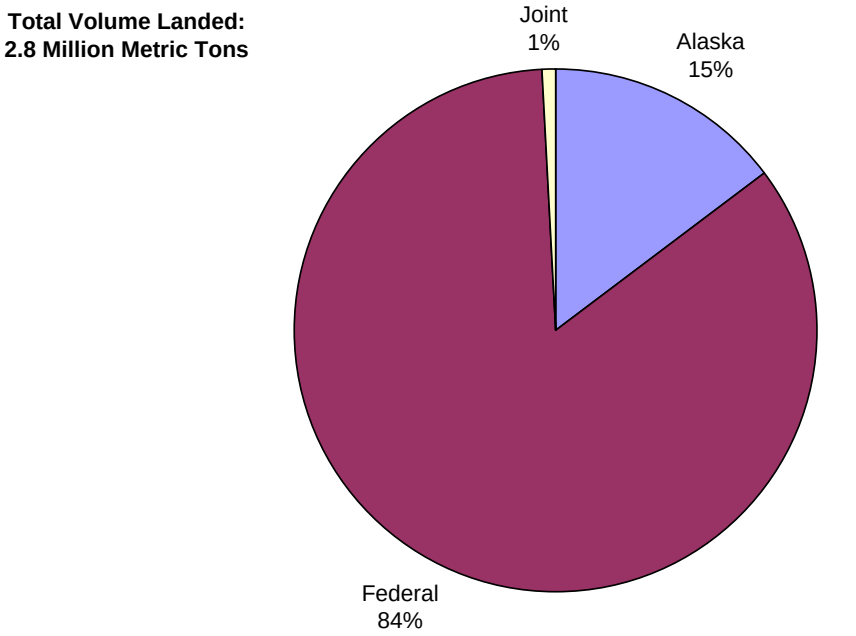
4.3 Economic Impacts by Fisheries Jurisdiction

This section separates the economic impacts of Alaska's seafood industry according to fisheries jurisdiction. Fisheries in Alaska are under state management, federal management or joint-management (these are primarily fisheries in federal waters managed by the State of Alaska under federal delegation). The federal government has primary jurisdiction over groundfish, halibut (in cooperation with the IPHC) and most sablefish fisheries. Joint jurisdiction, resulting from a federal delegation of authority, is found in the Bering Sea crab fisheries as well as in the Southeast Alaska Chinook salmon troll fishery. The state has primary jurisdiction over all other major fisheries in Alaska, including salmon and herring. In addition, it manages inshore sablefish fisheries in Southeast Alaska and a portion of the pollock and Pacific cod fisheries.

Because most shore-based processing plants process fish from all jurisdictions, often simultaneously, data to estimate harvesting and processing employment by fisheries jurisdiction are not available.

Figure 21 shows that of the 2.8 million metric tons that was landed in 2007, 84.4 percent was landed in federally managed waters. As mentioned above the federal government has primary jurisdiction over groundfish and halibut.

Figure 21. Percentage of Volume Landed of Alaska Seafood Industry by Fisheries Jurisdiction, 2007

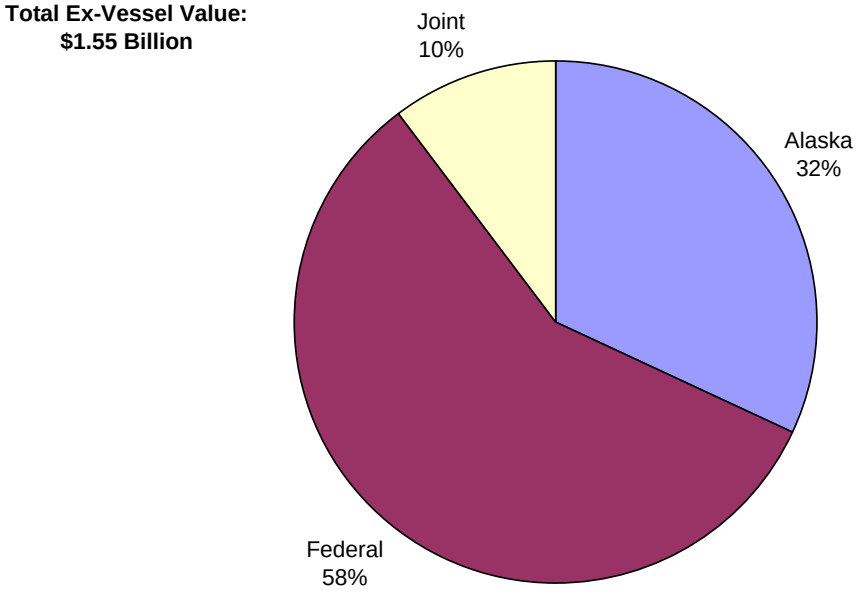


Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.3.1 Ex-vessel Value

Of the total ex-vessel value of Alaska commercial landings in 2007, federally managed fisheries accounted for 58 percent of the total ex-vessel value (Figure 22). State managed fisheries represented about 32 percent.

Figure 22. Percentage of Ex-vessel Value of Alaska Seafood Industry by Fisheries Jurisdiction, 2007

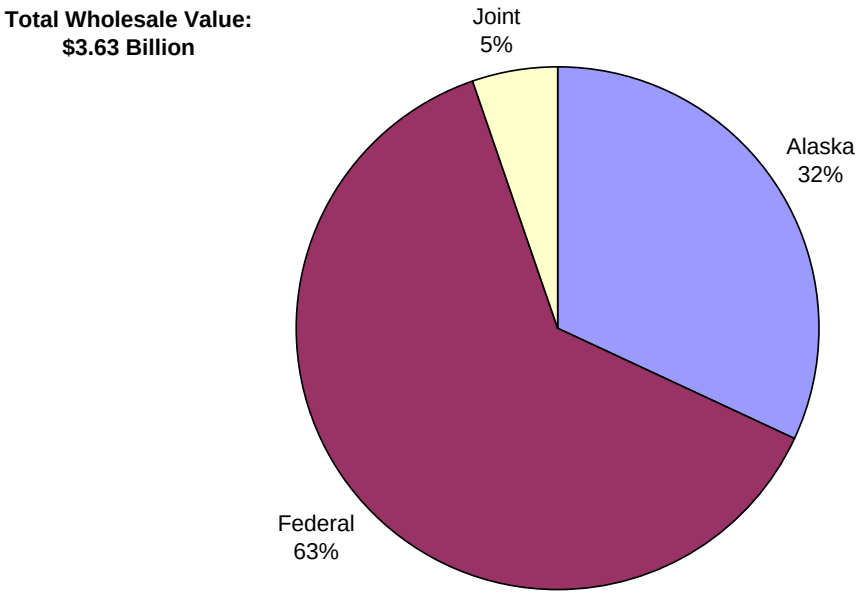


Note: Includes imputed ex-vessel values of fish harvested by catcher processors
Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.3.2 First Wholesale Value

As shown in Figure 23, the first wholesale value of seafood caught in federal fisheries represented about 63 percent of the total value of $3.63 billion in 2007. Harvests from state-managed fisheries accounted for about 32 percent of the total first wholesale value, with joint fisheries accounting for the remaining 5 percent.

Figure 23. Percentage of Wholesale Value of Alaska Seafood Industry by Fisheries Jurisdiction, 2007

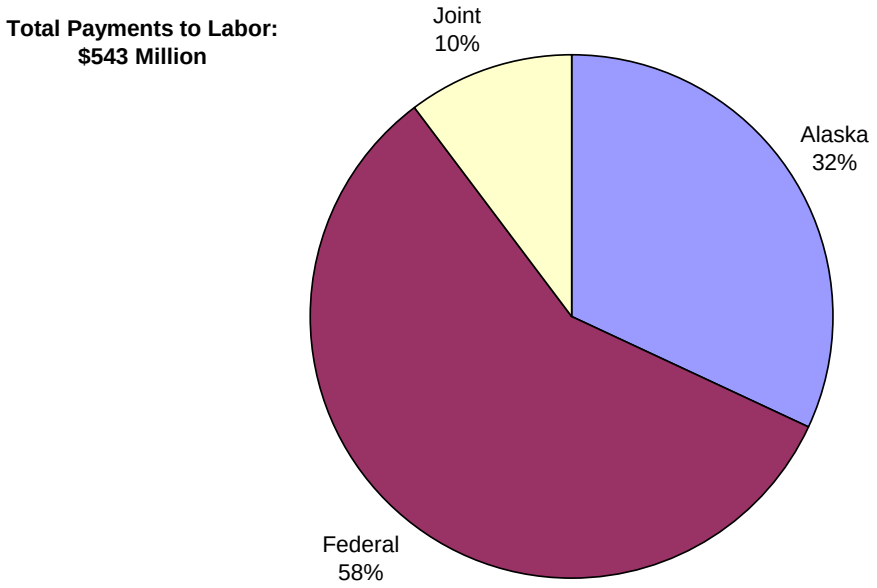


Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.3.3 Payments to Labor

Figure 24 shows the estimated harvesting payments to labor associated with each of the three fisheries jurisdictional areas. Fisheries under federal jurisdiction accounted for the largest share (58 percent) of payments to labor in 2007. State fisheries accounted for about 32 percent of payments to labor. Comparable estimates of payments to labor in the processing sector are unavailable because the large processing facilities receive fish and shellfish caught in all jurisdictional areas.

Figure 24. Percentage of Alaska Seafood Harvesting Payments to Labor by Fisheries Jurisdiction, 2007

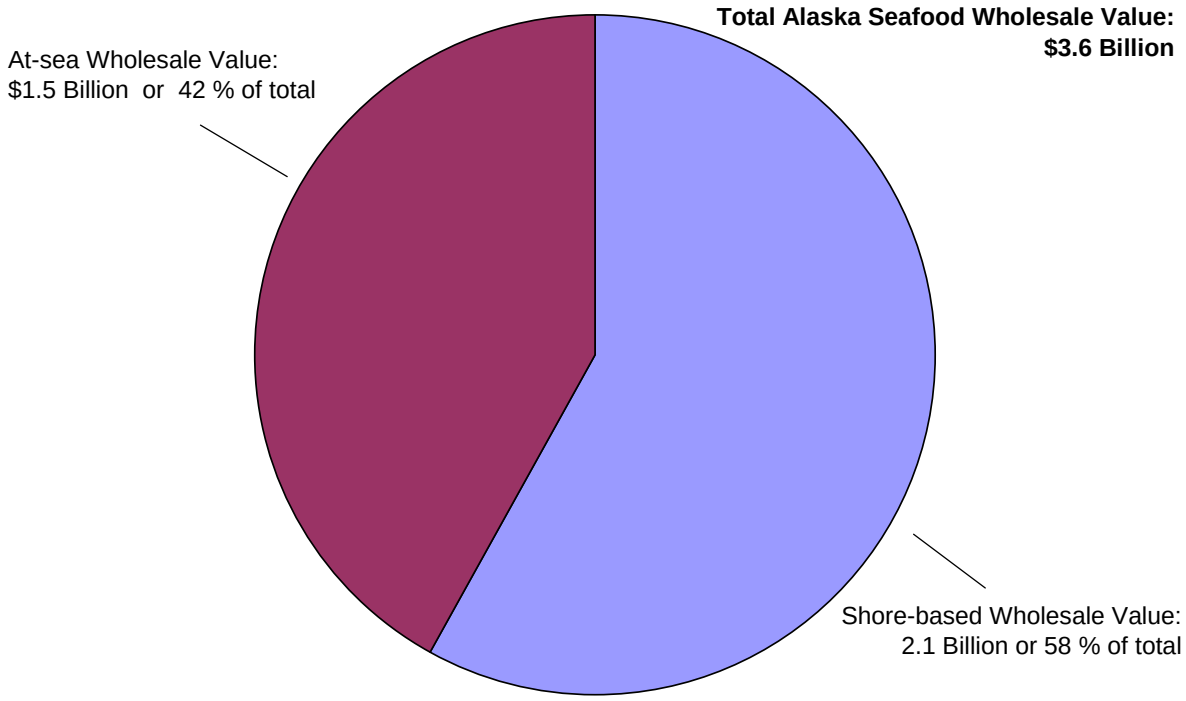


Source: Developed by Northern Economics from Hiatt (2008a).

4.4 Comparison of Shore-based and At-Sea Sectors

The at-sea fisheries make an important contribution to the Alaska fisheries. The at-sea sector is primarily involved in the capture and processing of Bering Sea and Aleutian Island resources, mainly groundfish but also some at-sea crab and halibut.[30] In addition, some at-sea processing is done in the Gulf of Alaska. Figure 25 shows the percentage of first wholesale value of the Alaska seafood industry harvest in 2007 divided between the at-sea and shore-based sectors. In 2007 the total wholesale value was $3.6 billion and 42 percent, ($1.5 billion) of that came from the at-sea sector.

Figure 25. Percentage of Wholesale Value of Alaska Seafood Industry, At-sea and Shore-based, 2007



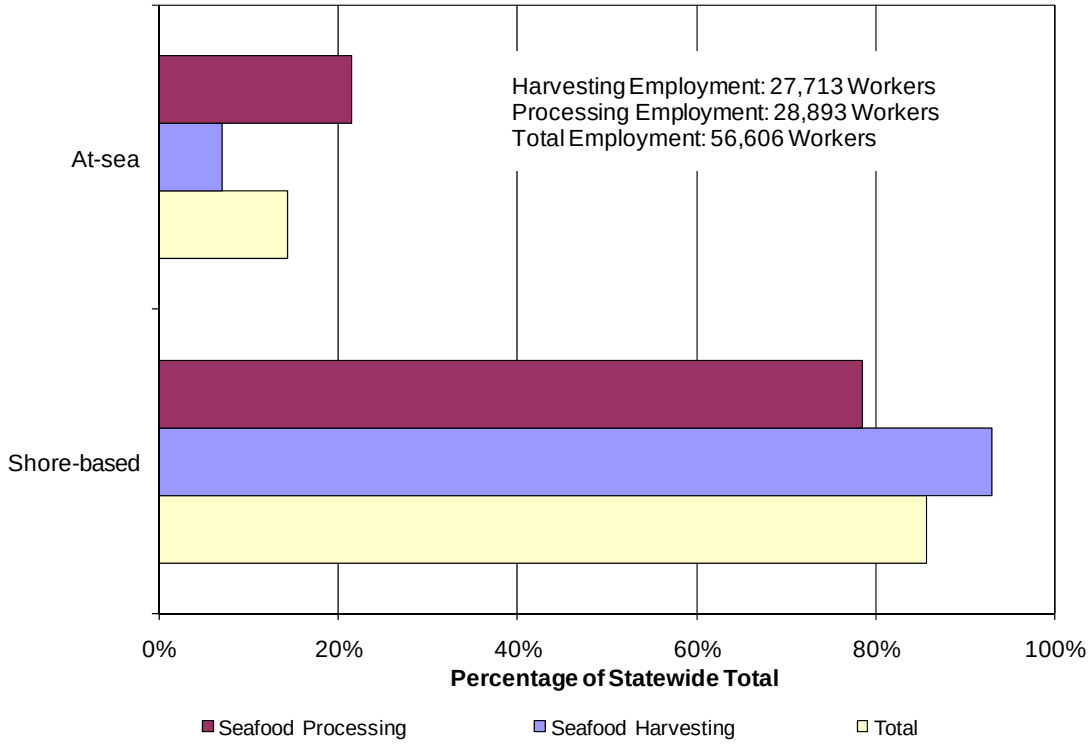
Source: Developed by Northern Economics based on data from Hiatt (2008a).

[30] The at-sea numbers also includes small amounts of fish landed at shore plants outside Alaska.

Figure 26 shows the number of workers employed in seafood harvesting and seafood processing divided between the at-sea and shore-based sectors in 2006.[31] The figure shows percentages of Alaska seafood processing and harvesting workforce in the at-sea and shore-based sectors, as well as percentages of the state's total seafood industry in at-sea and shore-based sectors.

The figure shows that 93 percent of the harvesting jobs and 79 percent of the processing jobs are found in the shore-based sector of the industry.

Figure 26. Percentage of Alaska Seafood Processing and Harvesting Workforce in the At-sea and Shore-based Sectors, 2006



Note: Workforce refers to the number of individual workers employed in an industry for any amount of time during the year.

Source: Developed by Northern Economics from ADOLWD (2007a) and Hiatt (2008a).

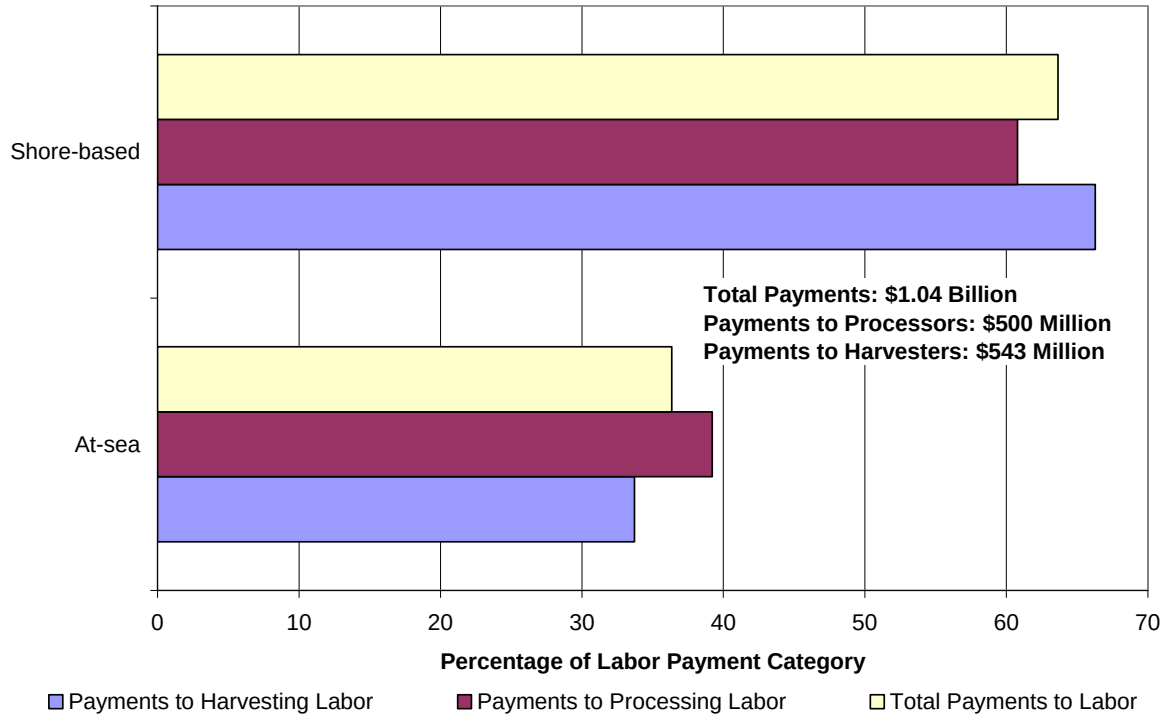
Figure 27 shows the percentages of Alaska seafood industry payments to labor divided between the at-sea and shore-based sectors in Alaska in 2007. The estimated total payment to labor was $1.04 billion. Payments to the shore based sector accounted for 64 percent of the all payments to labor, while the at-sea sector accounted for 36 percent.

In total, the figure shows that 36 percent of total payments to labor went to the at-sea sector. As indicated in Figure 26 above, it is estimated that the at-sea sector accounted for only about 14 percent of seafood industry workforce in 2006. One reason that the payments to labor in the at-sea sector are disproportionately large in comparison to the number of employees is that on average they are employed for relatively long periods of time. In addition, unlike shore-side processing workers, who are usually paid an hourly wage, the majority of at-sea processing workers are paid by

[31] Workforce estimates of the shore-based processing sector for 2007 were not available at the time of this publication, and therefore these numbers reflect the estimated workforces in 2006.

percentage of catch or by what is called a case rate based on the market value of the product being produced.

Figure 27. Percentage of Alaska Seafood Industry Payments to Labor in the At-sea and Shore-based Sectors, 2007



Source: Shore-based processing estimates from ADOLWD (2008b). Harvesting and at-sea estimates were based on data from Hiatt (2008a).

4.5 Statewide Importance of Alaska Seafood Industry

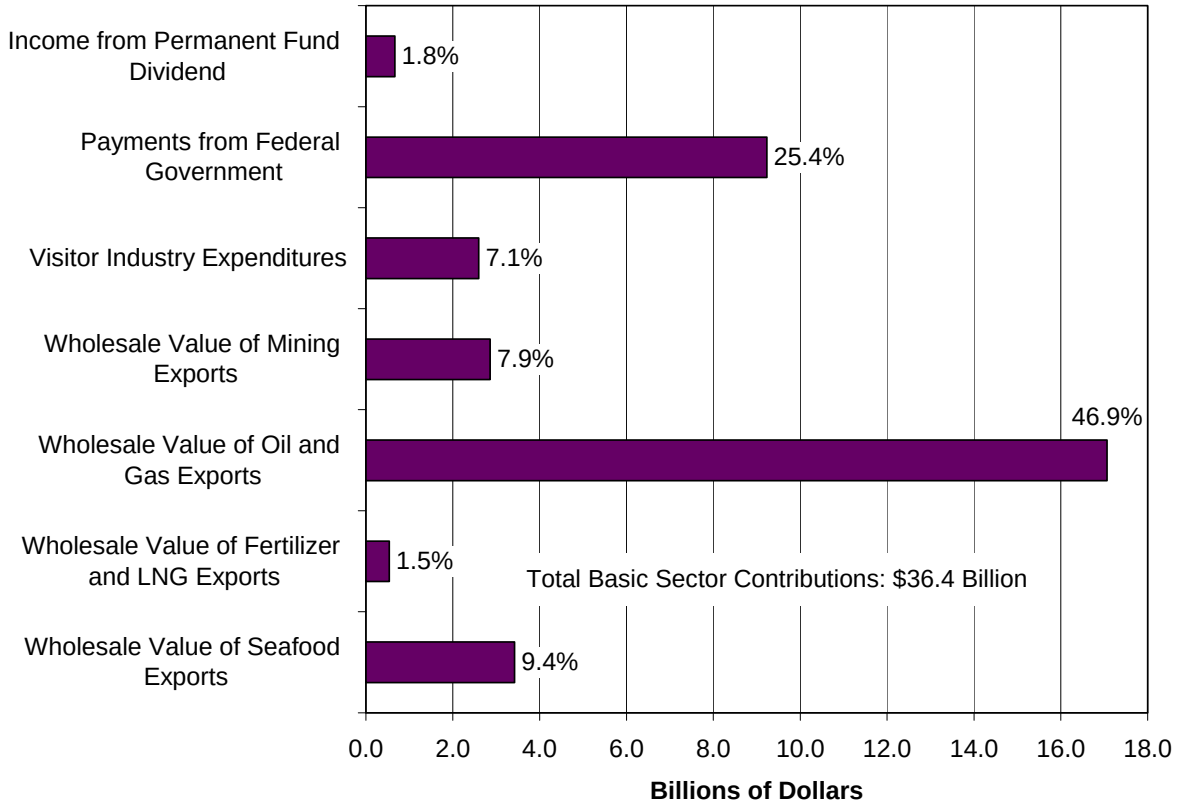
The seafood industry is a particularly important component of Alaska's economy because it is a major part of the basic sector. By bringing money into the State from outside sources, the basic sector is considered the "engine" of the economy. The non-basic sector, which consists of firms that sell goods and services to local businesses and consumers, is dependent on the basic sector to keep the economy running. In addition to the seafood industry, Alaska's basic sector includes the Cook Inlet and North Slope oil and gas industry, mining industry, tourism, payments from the federal government and the Permanent Fund.

Figure 28 provides a comparison of the contributions of the components of the basic sector to Alaska's economy. Northern Economics estimated that the basic sector brought approximately $36.4 billion into the state in 2006.[32] Of this total, the seafood industry contributed $3.4 billion, or 9.4 percent. This estimate does not include federal government expenditures on commercial fisheries management and research in Alaska (Section 4.8). The seafood industry ranks third in importance behind the North Slope oil and gas industry and federal government in terms of generating basic

[32] The estimate of basic sector income does not include private investment income or private pension income earned by individuals or entities such as the Alaska Native Corporations. Reliable estimates of the income of these components of the basic sector were not readily available.

economic activity in Alaska. According to ADCCED (2007), seafood is Alaska's top international export—seafood exports accounted for half of the state's total export value.[33] Exports of Alaska seafood were shown in Figure 12 and Figure 13 in the discussion of the importance of Alaska seafood in the global seafood market.

Figure 28. Comparison of Alaska Seafood Industry Output to Other Basic Sector Income, 2006



Note: At the time of publication 2007 data were not available for all sectors, so 2006 data were used.

Source: Developed by Northern Economics based on data from ADOR (2007b), U.S. Census Bureau (2007), ADCCED (2007b) Cruise Line International Association (2006), Alaska Office of the Governor (2007); and Hiatt (2008a)

As discussed in Section 4.5.1 below, Alaska's seafood industry generates millions of dollars in revenue through taxes and fees paid to the state and local governments. A testament to the longtime importance of the seafood industry in Alaska is the fact that the 1899 fisheries business tax is the oldest tax in the state (Alaska Department of Revenue 2006a).[34] While Alaska's seafood industry is currently far overshadowed by the state's petroleum industry in terms of generating state tax revenues, it is worth noting that since fish is a renewable resource, its long-term value to Alaska's economy ultimately has the potential to be greater than that of non-renewable petroleum (ADCCED 2002).

[33] ADCCED's export figure may understate the importance of Alaska's seafood industry due to the way in which the exports are monitored. Unlike Alaska's mineral and timber resources, which are for the most part shipped directly from Alaska ports, much of Alaska's seafood harvest, is first transported to Seattle and other Puget Sound area cities before being shipped to foreign countries. As a result, these products of Alaska origin are counted as exports from the State of Washington.

[34] In 1899, the U.S. Congress adopted a "salmon case" tax to fund fisheries-related activities in pre-territorial Alaska (ADOR 2006a).

Employment statistics also provide a sense of the scale of the economic contribution of the seafood harvesting and processing sectors to the Alaska economy. Extending a trend begun four years ago, total earnings and employment in the Alaska seafood industry are some of the highest in recent years. Including all harvesting and processing, Alaska's seafood industry is the largest private sector employer in the state.[35] In 2005, seafood harvesting jobs accounted for 3.2 percent of all private sector employment.[36] When seafood processing's 3.6 percent is added to harvesting, the combined seafood industry makes up 6.8 percent of Alaska's private sector employment (Robinson and Gilbertsen 2006).

In 2006, seafood processing made up more than one-fifth of the annual average employment in Alaska's "goods producing" sector and accounted for about 80 percent of all manufacturing employment (ADOLWD 2008). No other state has this level of industry concentration (Fried 1996). Eight seafood companies are on the list of Alaska's 100 largest employers (Fried 2007).[37]

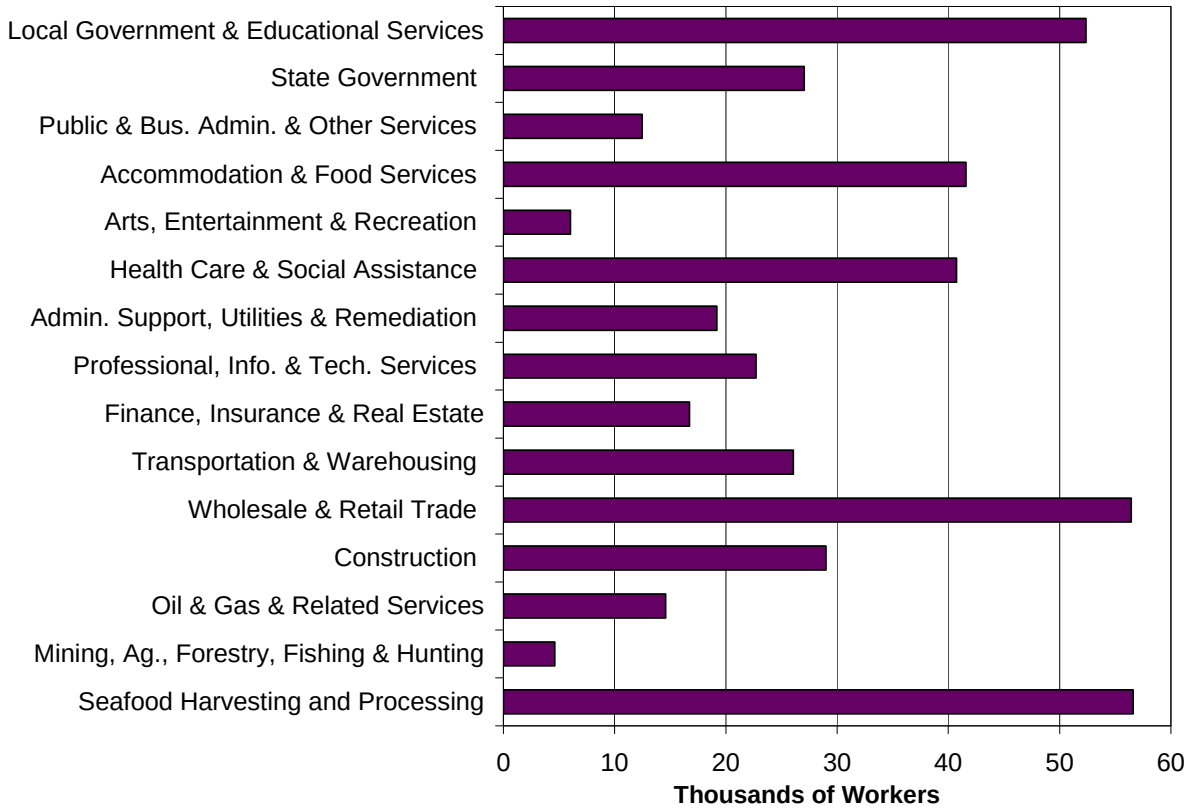
Figure 29 provides a comparison of the size of the Alaska seafood industry workforce (both harvesters and processors) to workforces in other sectors for 2006. With an estimated workforce of 56,606, the seafood industry employs more workers than any other industry sector. The retail and wholesale trade sector with a workforce of 56,445 is ranked second, while the government and education sector is third with 52,363 workers.

[35] As the state's economy has expanded and diversified, the relative importance of the seafood industry in terms of employment has declined. Two decades ago one of every eight jobs in Alaska's private sector was involved directly in fisheries, and the combined payroll in the seafood processing and harvesting sectors accounted for one-sixth of the state's total private sector economic base (Tremaine 1989).

[36] "Private sector employment" is defined here to mean all private wage and salary jobs combined with the fish harvesting employment discussed here. Self-employment, employment in industries not covered by state unemployment insurance laws and all other agricultural employment are excluded (Robinson and Gilbertsen 2006).

[37] The eight seafood processing companies on the 2006 *Trends* 100 list and their average monthly employment were Trident Seafoods (1,951), UniSea (923), Icicle Seafoods (783), Westward Seafoods (686), Peter Pan Seafoods (628), Ocean Beauty Seafoods (596), North Pacific Seafoods (402) and NorQuest Seafoods (351).

Figure 29. Comparison of Alaska Seafood Workforce to Workforces in Other Sectors, 2006



Notes:

1) Workforce refers to the number of workers employed for any amount of time during the year.

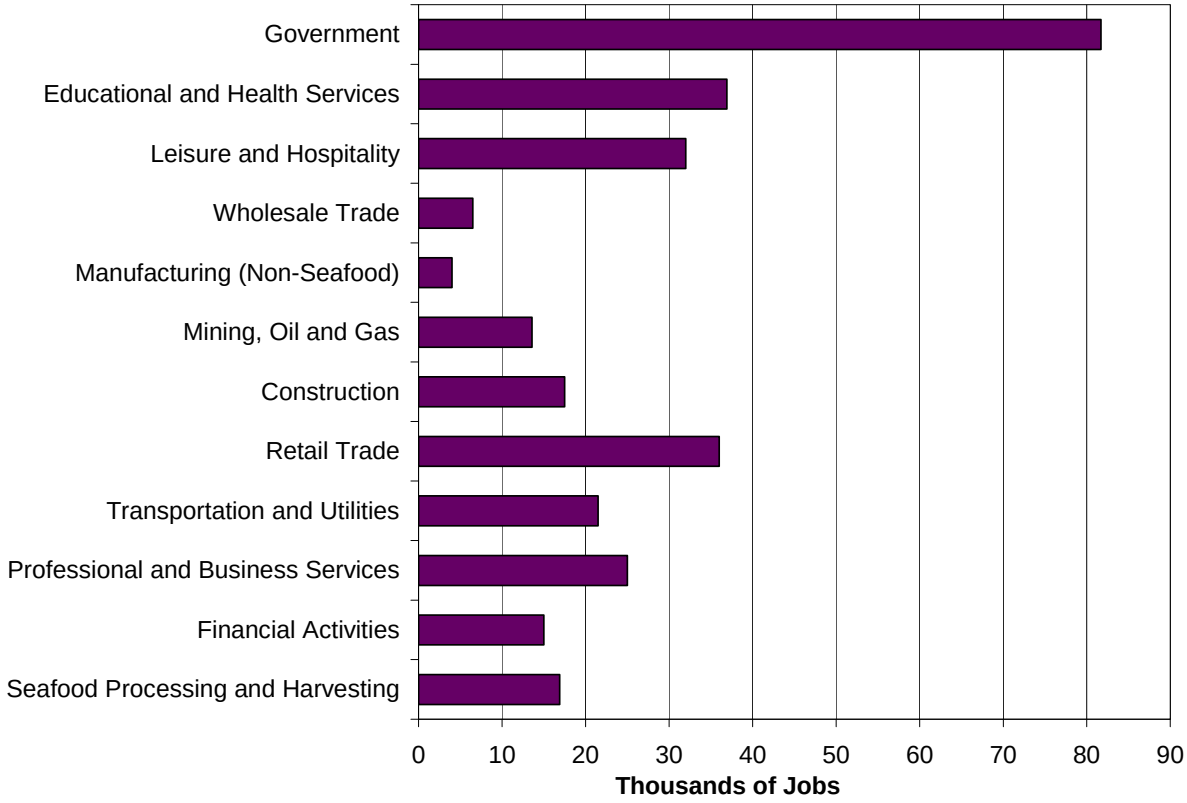
2) ADOLWD does not estimate the number of all workers employed in the at-sea processing sector. Based on NMFS crew count data for these boats it was estimated that this sector employs about 6,203 processing workers and 1,936 harvesting workers.

3) 2007 data are not available.

Source: Developed by Northern Economics based on ADOLWD, (2007a, 2008b) and Hiatt (2008a).

While Figure 29 above shows the size of total seafood workforce, Figure 30 below compares annual average employment in the seafood industry with other industries in the state in 2007. Because the seafood industry is very seasonal in nature (see Figure 32), the estimated average number of employees across all months of the year (16,886) is much less than the total size of the seafood workforce. The seafood industry is still the dominant employer among the natural resource-based industries, which also include agriculture, forest products, mining and oil and gas.

Figure 30. Comparison of Alaska Seafood Processing Industry Annual Average Employment to Other Industry Annual Average Employment, 2007



Notes:

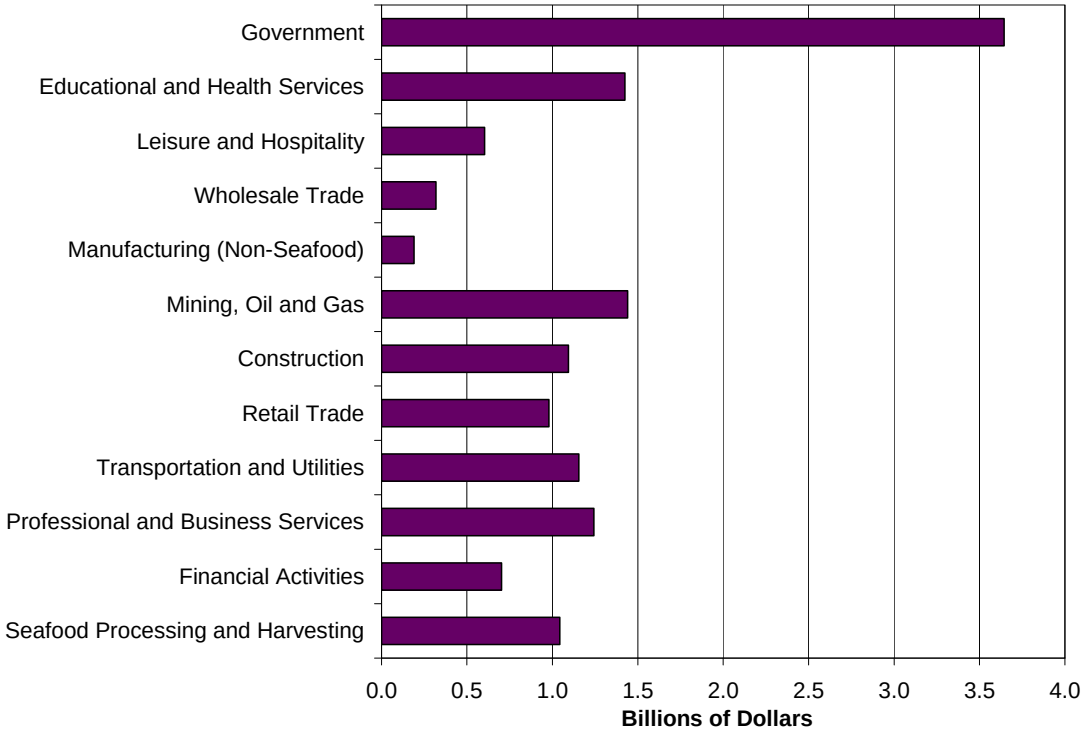
1) Annual average employment refers to the average number of monthly jobs over the full calendar year.

2) Data from ADOLWD do not include jobs in the at-sea processing sector. An estimate of the number of these jobs was derived from NMFS vessel and crew count data.

Source: Developed by Northern Economics based on ADOLWD, (2007a, 2008b) and Hiatt (2008a).

Figure 31 compares payments to labor in the seafood industry with total wages in other industries in 2007. Payments to labor for the seafood industry include estimated payments made to nonresidents whose earnings may be reported in another state (for example, workers on Seattle-based catcher-processors). The estimate for seafood processing includes workers in the at-sea sector.

Figure 31. Comparison of Alaska Seafood Industry Payments to Labor to Other Industries, 2007



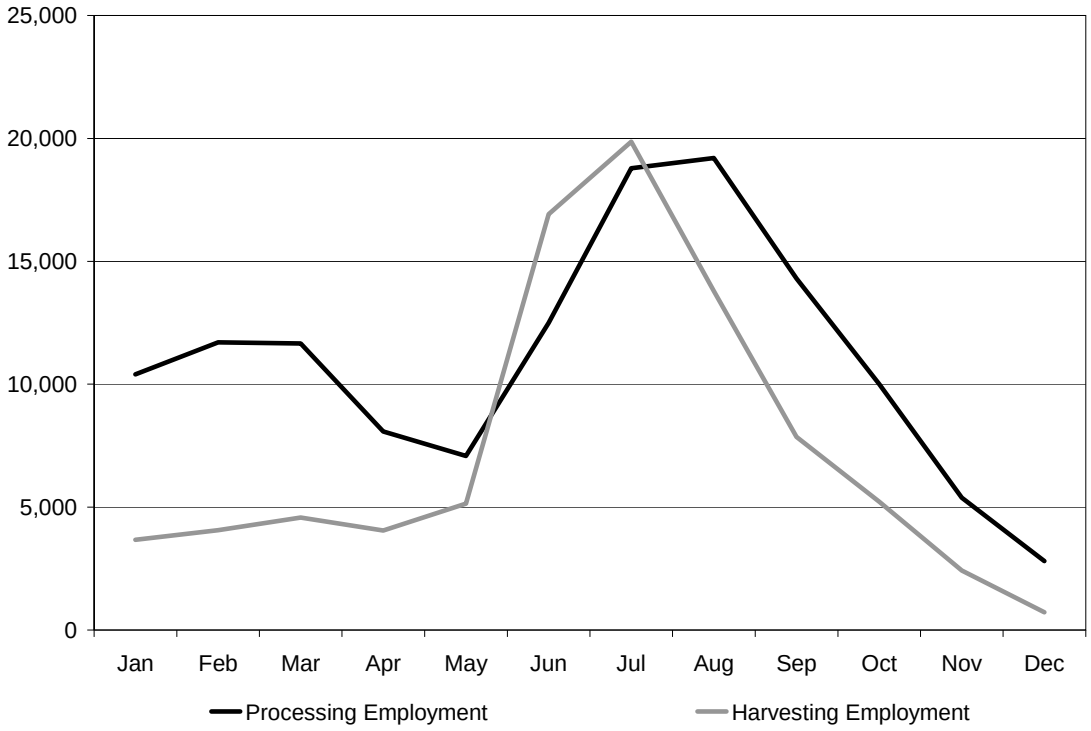
Notes: Data from ADOLWD only includes data on standard employee/employer relationships where wages and unemployment taxes are paid and collected. Only the shore-based processing portion of the seafood industry fall into this category, thus payments to labor for harvesters and the at-sea sector are estimated by Northern Economics.

Source: Developed by Northern Economics based on ADOLWD, 2007a, 2008b) and Hiatt (2008a)

While the Alaska seafood industry generates a large number of jobs, these jobs do not necessarily provide year-round employment. No other state's labor force shows as much seasonal fluctuation as Alaska's, and, except for the visitor industry, seafood harvesting and processing is Alaska's most seasonal industry (Fried 1996; Rae 1997). As shown in Figure 32, employment in the seafood processing sector in 2006 varied more than six-fold from the peak month (July) to the bottom month (December).[38] Figure 32 also shows the seasonality of jobs in the seafood harvesting sector. As with processing employment, harvesting employment typically reaches its peak in July before declining to the seasonal low point in December.

[38] Fried (1996) notes that the seasonality of seafood processing employment has varied over the years with the length and diversity of Alaska's fisheries. In the late 1970s and early 1980s, the king crab winter harvests boosted employment during traditionally low months. After the crash of the king crab fishery, seasonality increased dramatically. With the advent of the huge harvest of groundfish during the non-summer months, employment became year-round.

Figure 32. Alaska Seafood Processing and Harvesting Average Monthly Employment, 2006



Notes:

1) Average monthly employment refers to the average number of monthly jobs.

2) Data from ADOLWD do not include jobs in the at-sea sector. An estimate of the number of these jobs was derived from NMFS vessel and crew count data.

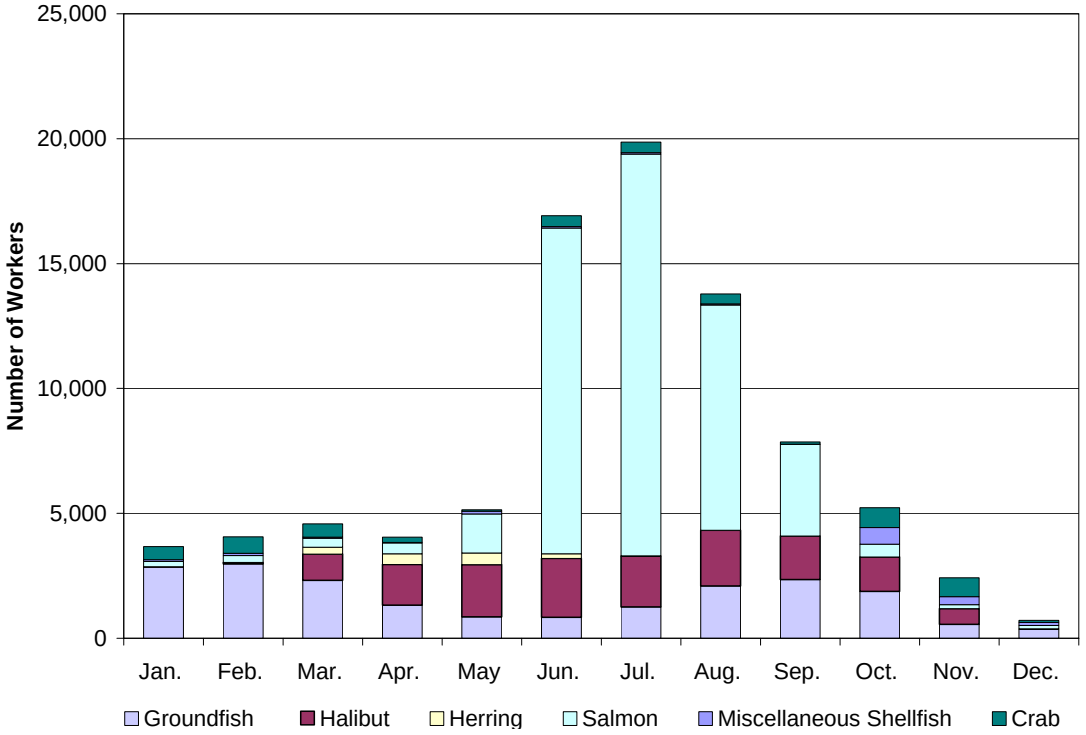
3) 2007 data were not available at the time of this publication.

Source: Developed by Northern Economics based on data from ADOLWD (2008b) and Hiatt (2008a).

In contrast to the highly seasonal salmon fishery, Alaska's halibut and various groundfish fisheries provide a more constant number of jobs month to month (Figure 33). Also unlike employment in the salmon fishery, the peak months for jobs in the crab fishery occur in the less hospitable winter months (Olson and Robinson 2004). The crab fishery starts the year with the Bering Sea snow crab fishery, which reaches full strength in February, while the Bristol Bay red king crab fishery ramps up jobs in the late fall, especially October.[39] The summer months in between concentrate jobs primarily in the dungeness crab fishery in the Southeast region. Miscellaneous shellfish jobs spike in October with the shrimp pot fishery in the Southeast. Harvesting in Alaska's sac roe herring fisheries occurs in the spring with peak employment in May spread out in all regions of the state (Olson and Robinson 2004).

[39] Robinson and Gilbertsen (2006) note that rationalizing the Bristol Bay red king crab fishery in 2005 has lowered employment in the peak month of October and raised employment levels in November and December as harvesters with quota shares are no longer in a race to harvest the available catch and they take longer to harvest their quotas. Additional information on the effects of rationalization on employment in the BSAI crab fisheries is provided in Section 2.5.

Figure 33. Alaska Shore-based Harvesting Average Monthly Employment by Species, 2006



Notes:

1) 2006 halibut fishing employment data are unavailable; 2005's monthly halibut figures have been used as a proxy for 2006.

2) Data from ADOLWD do not include jobs in the at-sea processing sector. An estimate of the number of these jobs was derived from NMFS vessel and crew count data.

3) 2007 data are not available.

Source: Developed by Northern Economics based on data from ADOLWD (2007c) and Hiatt (2008a).

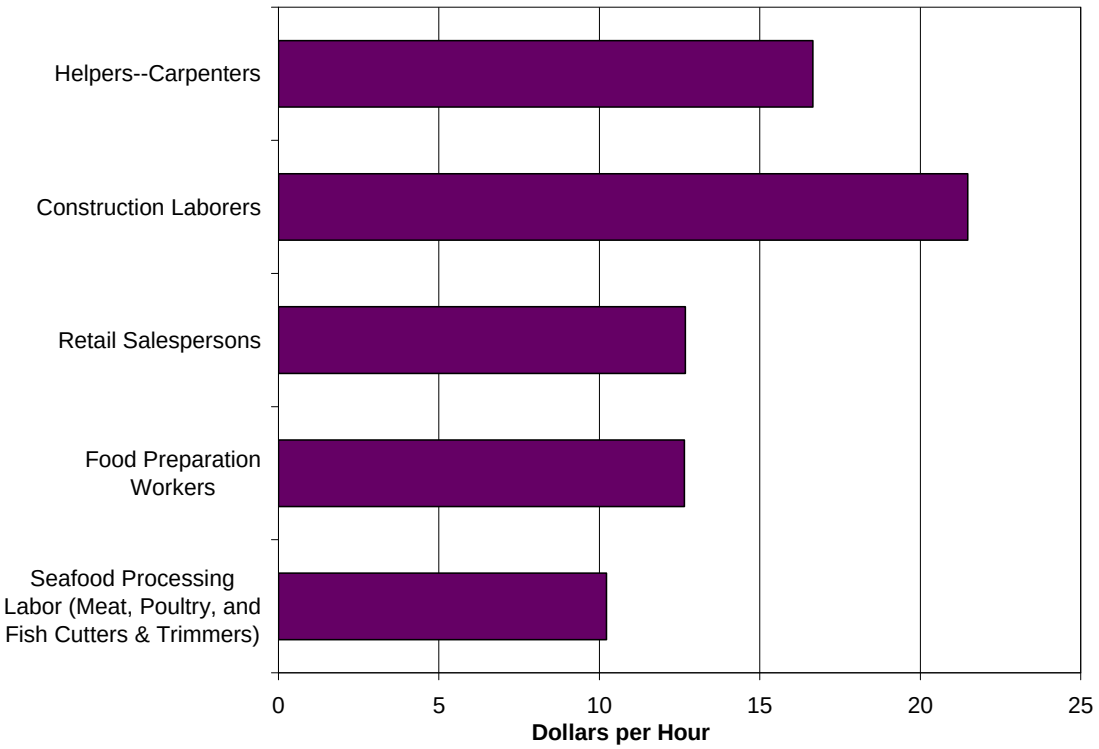
Because some fishing seasons are so short, many seafood harvesters work wage and salary jobs to supplement their income from a fishing operation. Based on an analysis of active CFEC commercial fishing permit holders and their adult crew members, Wink et al. (2006) found that more than half of all resident Alaska harvesters relied on a wage and salary job in addition to their fish harvesting work to earn a living in 2006. That's a higher rate of multiple job holding than for Alaska wage and salary workers in general, where only about 32 percent held multiple jobs in 2006.

In addition to the length of the fishing season, gear type and amount of required capitalization dictates whether it is possible, or prudent, for Alaska seafood harvesters to hold down a shore-side job. The gear types with permit holders that had the highest percentages of non-fishing jobs in 2006 were set gillnet (64 percent), hand troll (55 percent), drift gillnet (42 percent) and longline (36 percent). The set gillnet and hand troll gear, for instance, are for fisheries that have short seasons and require less capital. Otter trawl (12 percent), power troll (18 percent), purse seine (21 percent) and pot gear (26 percent) permit holders possessed the lowest percentages of wage and salary

participation. Pot gear, for instance, is used mostly for the crab fisheries that have short seasons and require a lot of capital (Wink et al 2007).[40]

In addition to job duration, it is important to examine the level of compensation that seafood industry jobs offer. In 2007, the average hourly wage for jobs in the seafood on-shore processing sector was $10.22.[41] Other jobs in Alaska pay considerably more (Figure 34). Entry-level, on-shore processors in some remote areas earn the Alaska minimum wage rate of $7.15 per hour. In most cases, room and board and transportation are provided as well. Urban work sites without company housing pay a slightly higher wage (ADOLWD 2007b). On the other hand, as noted in Section 4.4, many at-sea processing workers are paid on a "share of catch" basis, and if a company has a good catch, a worker's earnings can be very high. It is also important to note that many fish processing occupations are highly skilled and well compensated, such as roe technicians (who grade the salmon roe and oversee its packing), machine maintenance occupations (including Baader filleting machine technicians) and surimi technicians (Fried 1996). The higher a particular shore-based processing job pays, the more likely an Alaska resident will be in that job (Miller 2002).

Figure 34. Comparison of Alaska Seafood Processing Average Hourly Wage to Other Occupational Average Hourly Wages, 2007



Note: Seafood Processing Labor is part of the class of workers officially titled Meat, Poultry, and Fish Cutters & Trimmers. In Alaska the number of this class of workers that are not in the seafood industry is *de minimus*.

Source: Developed by Northern Economics based on data from ADOLWD (2008c).

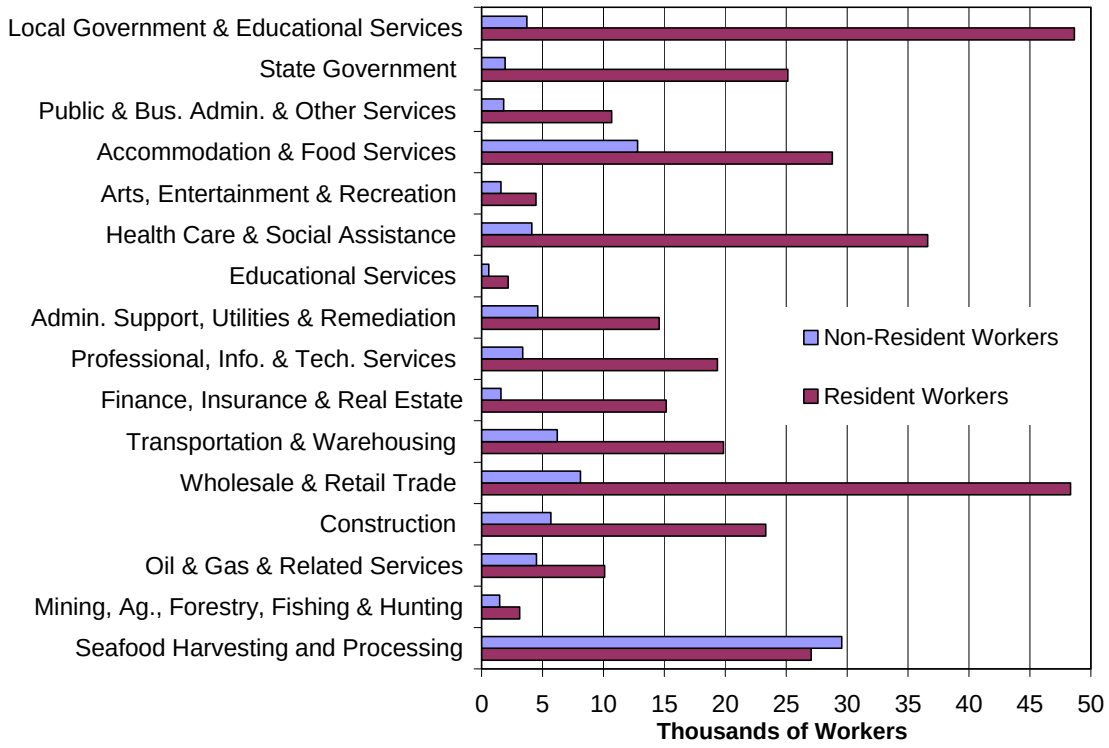
[40] Purse seiners, gillnetters and trollers participate in salmon fisheries. Herring is also caught by purse seiners. Pot boats catch crab and groundfish, while longliners harvest halibut and groundfish and trawlers focus on groundfish.

[41] Many processing workers, particularly in remote areas, receive room and board in addition to their wages.

In a discussion of the relative economic impact of the Alaska seafood industry it is important to examine the state of residency of seafood industry workers. As noted in Section 4.7, Alaska's seafood processing sector generates thousands of jobs but employs relatively few residents of Alaska (Figure 35). In 2006, the seafood processing sector employed the highest number and greatest percentage of nonresident workers of any industry sector in the state (ADOLWD 2008).[42] Nonresident seafood processing workers accounted for 22 percent of the private, nonresident workforce in Alaska (ADOLWD 2008). What this high percentage of nonresident employee means is that while seafood processing is an important driver of the state economy, much of the labor income earned in the sector flows out of Alaska.

With respect to seafood harvesters, data from ADOLWD indicate that residents hold most fish harvesting jobs in Alaska, but most of the earnings generated by harvesters accrue to nonresidents—primarily from the harvest of groundfish. In 2006, nonresident individuals accounted for $1.08 billion of the $1.48 billion landed in all Alaska fisheries. This means that nearly three-quarters of the total ex-vessel value accrued to nonresident seafood harvesters.

Figure 35. Comparison of Resident and Non-Resident Workforces by Sector, 2006



Notes:

1) Workforce refers to the number of workers employed for any amount of time during the year.

2) ADOLWD does not estimate the number of all workers employed in the at-sea processing sector. Based on NMFS crew count data for these boats it was estimated that this sector employs about 6,203 processing workers and 1,936 harvesting workers.

3) 2007 data are not available.

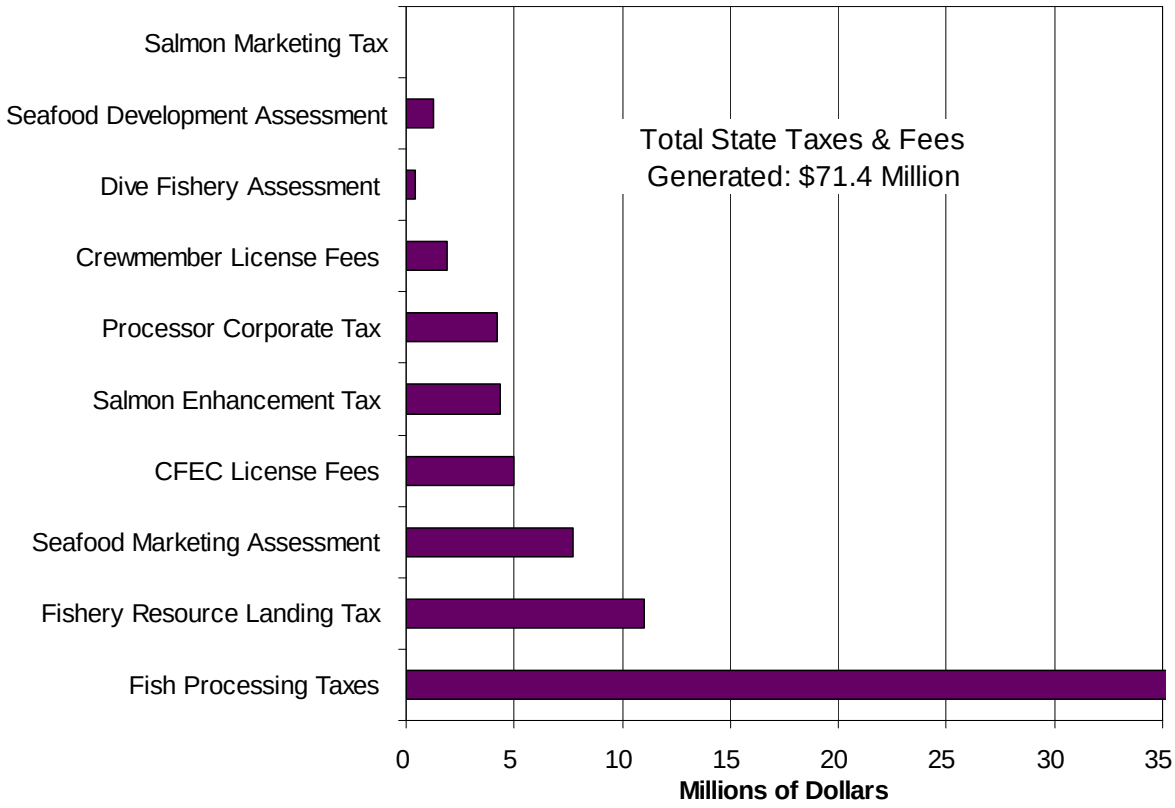
Source: Developed by Northern Economics based on data from (ADOLWD (2007a and 2008b) and Hiatt, 2008a)

[42] Whereas many of the early salmon cannery workers were Filipinos (Footnote 11), in more recent years immigrants in Alaska's seafood processing sector tend to be from Mexico and Central America. (Gerjevic 1998).

4.5.1 State Taxes and Fees

Alaska's seafood industry contributed about $71.4 million in state taxes and fees in 2007 (Figure 36). The industry also pays a significant portion of the marine fuel taxes collected in the state, although estimates of these tax payments are not readily available.

Figure 36. State Revenue Generated by Alaska's Seafood Industry, 2007



Note: CFEC Licenses Fees, Crewmember License Fees and Processor Corporate Taxes reflect 2006 values.
Source: Developed by Northern Economics based on data from ADCCED (2007), ADOR (2008).

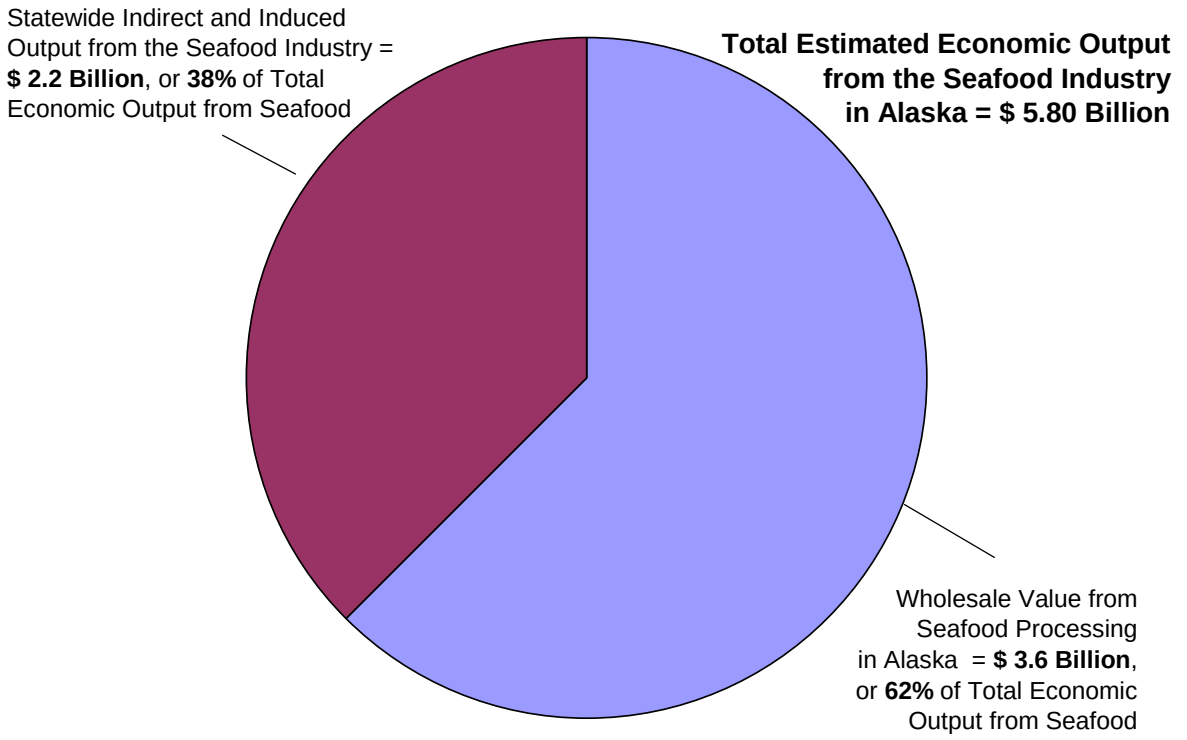
The seafood industry pays a variety of state taxes, some of which are shared with the local jurisdictions in which the raw fish or processed product is landed. In addition, Alaska municipalities have the power to implement their own local tax on the sale of fish to processors and other local fisheries-related taxes. The total of these municipal taxes in 2006 was approximately $13.9 million. Both shared state taxes and municipal taxes are discussed in more detail in Section 4.6.5.

4.5.2 Economic Multiplier Effects of Alaska's Seafood Industry

Alaska seafood not only generates direct economic output, jobs, and payments to labor (income) within the industry, it also generates economic output, jobs and payments to labor in the industries that supply fuel, parts, processing materials and transportation. Collectively, the impacts in these supply industries are known as indirect effects. In addition, Alaska seafood induces further economic activity in Alaska, through the payments to labor that are made both to workers in the seafood industry and to workers in the supply industries. These induced effects occur as workers spend their income on food, clothing, housing and other consumer goods and services.

Figure 37 shows the estimated direct, indirect, and induced economic output from Alaska's seafood industry in Alaska for 2007. Estimates of direct output are equal to estimated wholesale value from both at-sea and shore-based processors discussed in earlier sections.[43] Estimates of indirect and induced impacts (sometimes referred to as multiplier effects) have been generated for the Alaska Seafood industry using software and data from IMPLAN™. It is estimated that the $3.6 billion in wholesale value generated by the seafood processing industry generates an additional $2.2 billion in indirect and induced economic output throughout the state. This represents an output-to-output multiplier of 1.6—every $1 million of wholesale value in the seafood industry generates an additional $600,000 in indirect and induced output. Figure 38 and Figure 39 show statewide estimates of direct workers and payments to labors as well as indirect, and induced effects on jobs and payments to labor.[44] An additional 21,913 indirect and induced workers are employed as a result of the seafood industry in Alaska, and they earn an additional $0.71 billion in income.

Figure 37. Estimated Direct, Indirect, and Induced Economic Output of Alaska's Seafood Industry

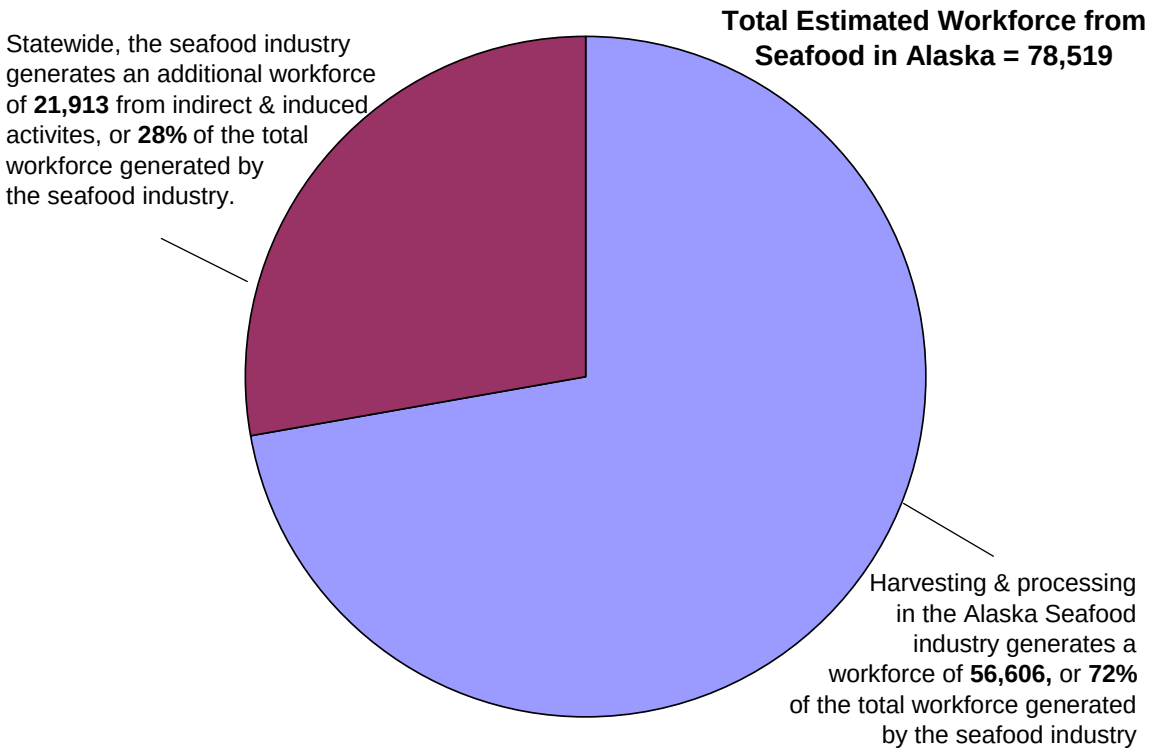


Source: Estimated by Northern Economics, Inc., using multipliers from IMPLAN software.

[43] The estimate of indirect and induced output includes the ex-vessel payments made to harvesters. This is proper since fish harvesters supply goods and services to the processing industry similar to other industry suppliers such as the paper industry and the transportation industry.

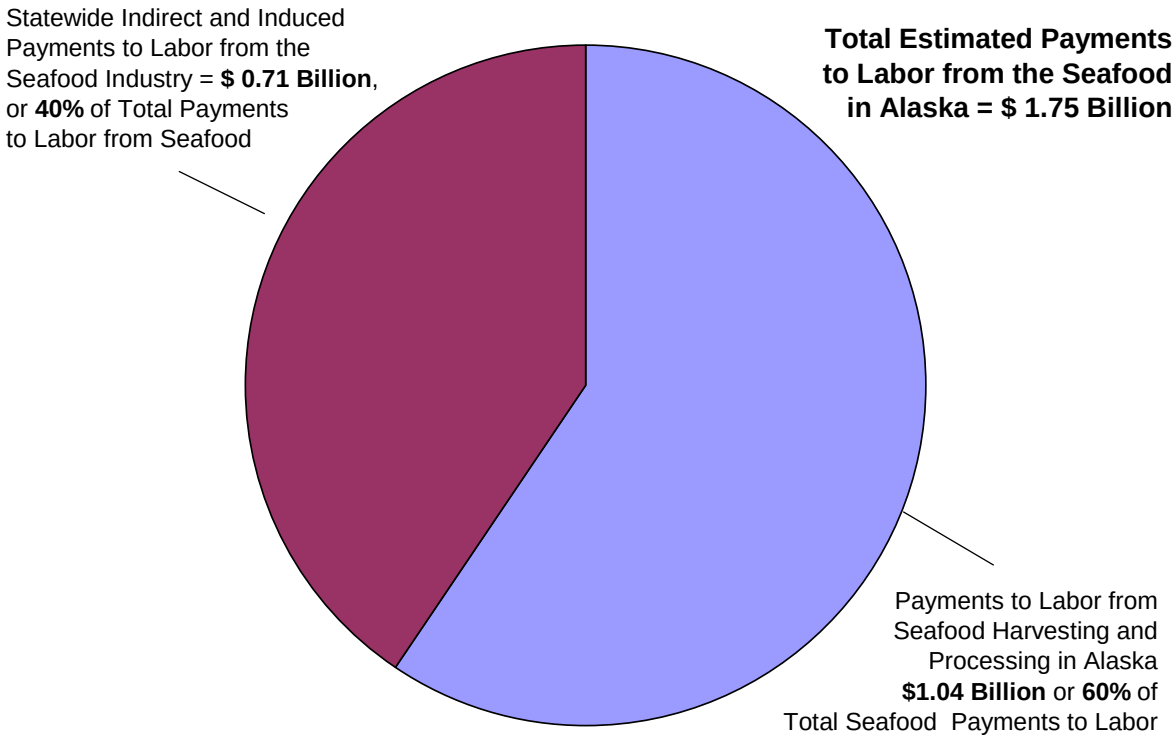
[44] In these two figures the entire harvesting workforce and all payments to labor made to harvesters are included in the estimates of direct effects. The indirect and induced effects have been adjusted to account for this and to avoid double counting.

Figure 38. Estimated Direct, Indirect, and Induced Workers in the Seafood Industry in Alaska



Source: Estimated by Northern Economics, Inc. using multipliers from IMPLAN software.

Figure 39. Estimated Direct, Indirect, and Induced Payments to Labor in the Seafood Industry in Alaska

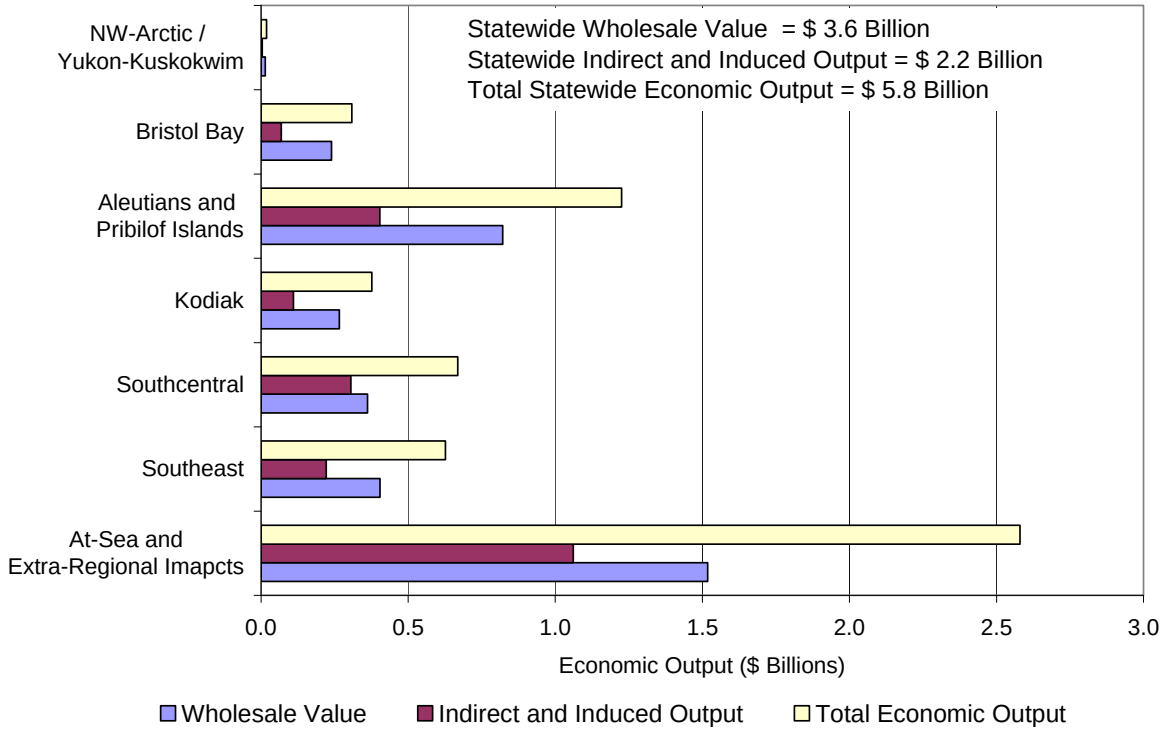


Source: Estimated by Northern Economics, Inc. using multipliers from IMPLAN software.

The seafood industry has variable levels of impacts within different regions. In general, the more developed a region's economy, the greater the additional impact the industry has inside the region. For example, harvesting and processing activity that takes place in South Central Alaska has a greater economic impact in that region than activity in Bristol Bay. Direct, indirect, and induced economic output by region (estimated using IMPLAN™) is shown in Figure 40. In the figure, the direct output is equal to the wholesale value of the seafood industry in the region for 2007[45].

In addition to indirect and induced impacts within the region, additional economic activity occurs outside the region, but still within the state.[46] These "extra-regional impacts" occur in the home regions of non-local harvesters, and in transportation and supply hubs. The direct effects of the at-sea processing sector are also shown as part of the "extra-regional" impacts, because they are not specific to any particular region of the state. IMPLAN does not provide data on linkages to other regions, but does provide a multiplier for the state as a whole, through which the extra-regional impacts as a whole can be calculated. Figure 40 shows the statewide total of extra-regional indirect and induced impacts to be $1.1 billion or 49 percent of all indirect and induced economic output. Figure 41 and Figure 42 show direct workers and payments to labor and estimates of indirect and induced jobss and payments to labor by region.

Figure 40. Estimated Direct, Indirect, and Induced Output of Alaska's Seafood Industry, by Region



Note: Impacts of at-sea and out of state processors are combined with indirect and induced impacts that cannot be specifically assigned to a particular region. These extra-regional impacts also include indirect and induced impacts of shore based processing that cannot be applied to a specific region.

Source: Developed by Northern Economics, Inc. using multipliers from IMPLAN software.

[45] The seafood harvesting industry is the primary supply industry for the seafood processing industry. Thus, all of the economic impacts of both seafood and harvesting are captured by conducting an input-output analysis of the seafood processing industry alone.

[46] There are also significant amounts of economic activity that leak out of the state to other states and countries.

Figure 41. Estimated Direct, Indirect, and Induced Workers in Alaska's Seafood Industry, by Region

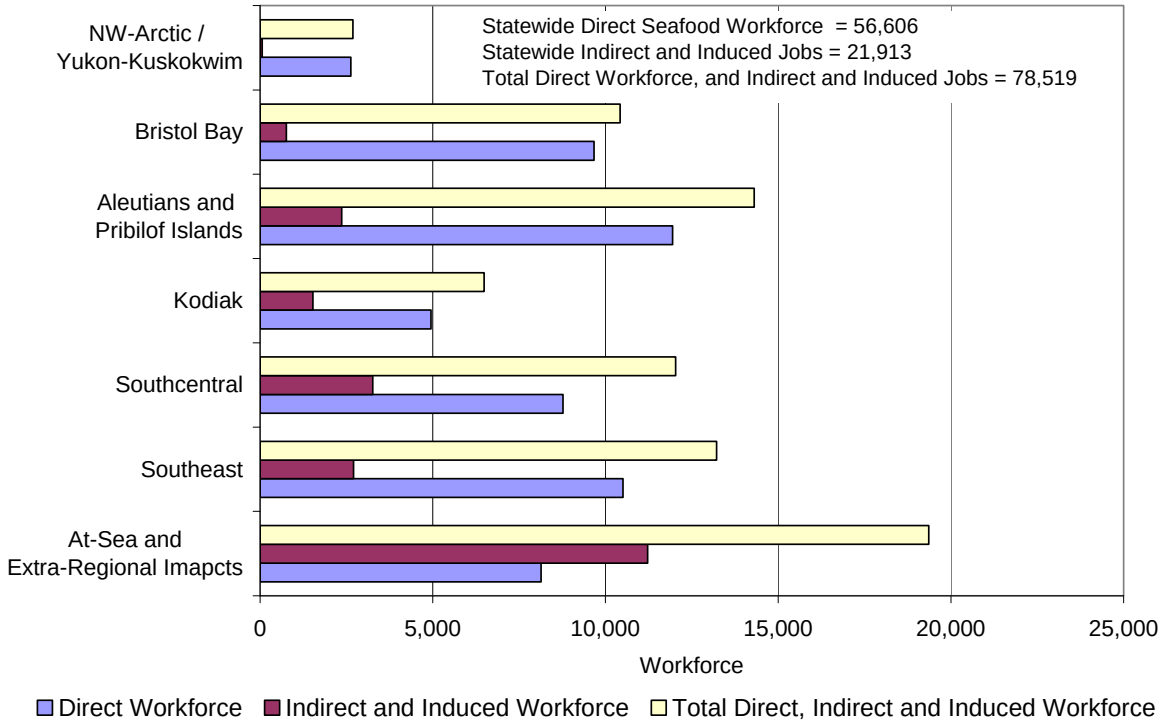
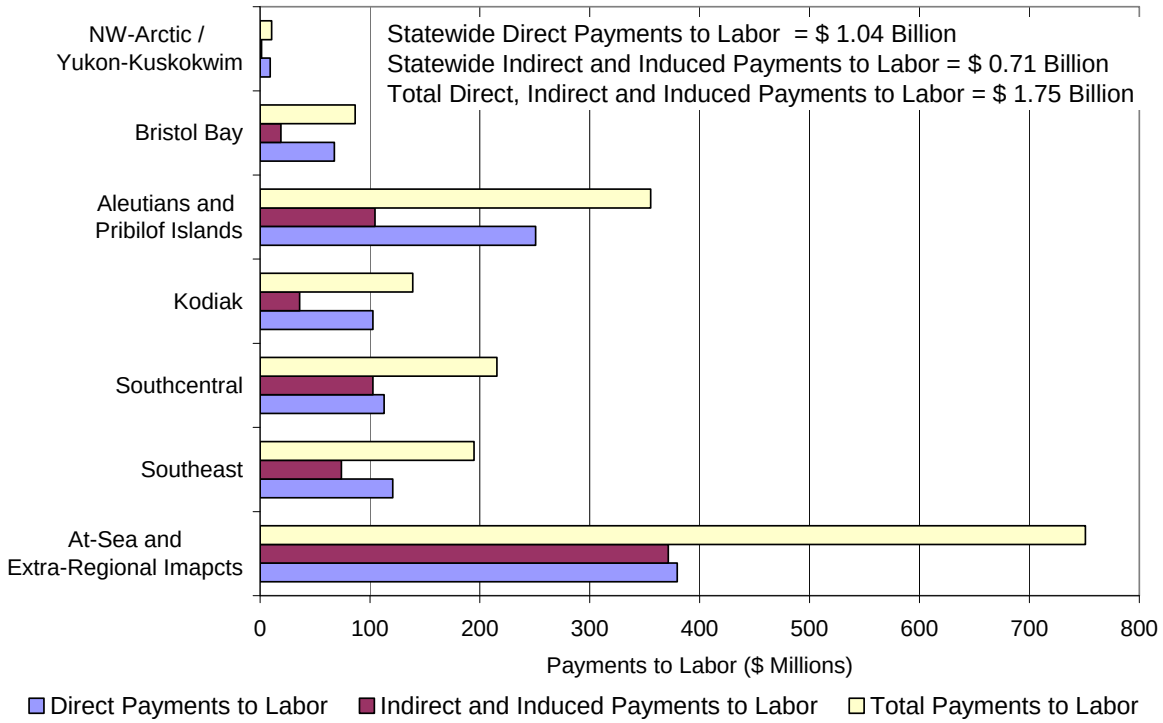


Figure 42. Estimated Direct, Indirect, and Induced Payments to Labor, by Region



Note for Figure 41 and Figure 42: Impacts of at-sea and out of state processors are combined with indirect and induced impacts that cannot be specifically assigned to a particular region. These extra-regional impacts also include indirect and induced impacts of processing that cannot be applied to a specific region.

Source: Developed by Northern Economics, Inc. using multipliers from IMPLAN software.

4.6 Economic Impacts by Alaska Geographic Region

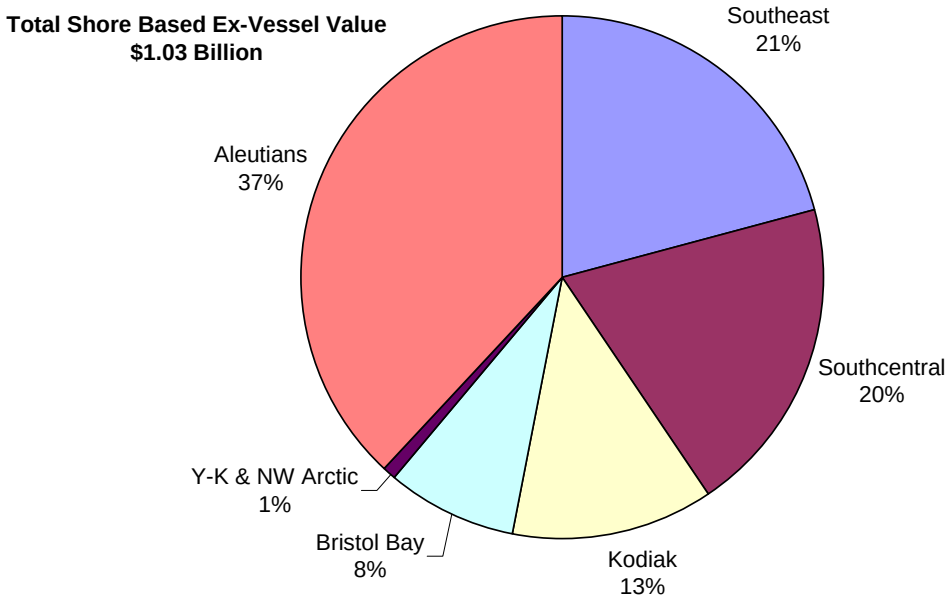
This section separates and compares the economic impacts of Alaska's seafood industry by regions (Figure 43), as well as by the seafood sector and other private sectors. The estimated economic impacts were credited to the region where the seafood was harvested or processed. The impacts of the at-sea sector (which includes catcher processors, vessels engaged solely in processing called "motherships" and catcher vessels that deliver fish to both catcher processors and motherships) operating mainly in the Bering Sea were reported in an "at-sea" category (Section 4.4). The impacts in the Northwest Alaska, Arctic, and Yukon-Kuskokwim regions were combined because the levels of commercial fishing activity in these regions are comparatively low. The analysis generally refers to the Alaska regions shown in Figure 43, but in some cases alternative regions are used in order to correspond to the way in which ADOLWD presents some seafood industry employment data. The charts will show regions from North to South, starting with the northernmost region at the top of the chart.

Figure 43. Alaska Seafood Industry Regions

4.6.1 Ex-vessel Value in Alaska Regions

Figure 44 divides the estimated statewide ex-vessel value of fish and shellfish harvests in 2007 among regions. The $1.03 billion total ex-vessel value shown in the figure does not include $522 million in estimated ex-vessel value for the at-sea sector and shore-based processors located outside the State of Alaska. The Aleutian and Pribilof Islands was clearly the dominant region in Alaska, with commercial landings valued at $392 million, 37 percent of the total ex-vessel value of all the regions. Southeast and Southcentral accounted for respectively 21 and 20 percent of the total ex-vessel value.

Figure 44. Percentage of Ex-vessel Value of Alaska Shore-based Seafood Industry Harvest by Region, 2007



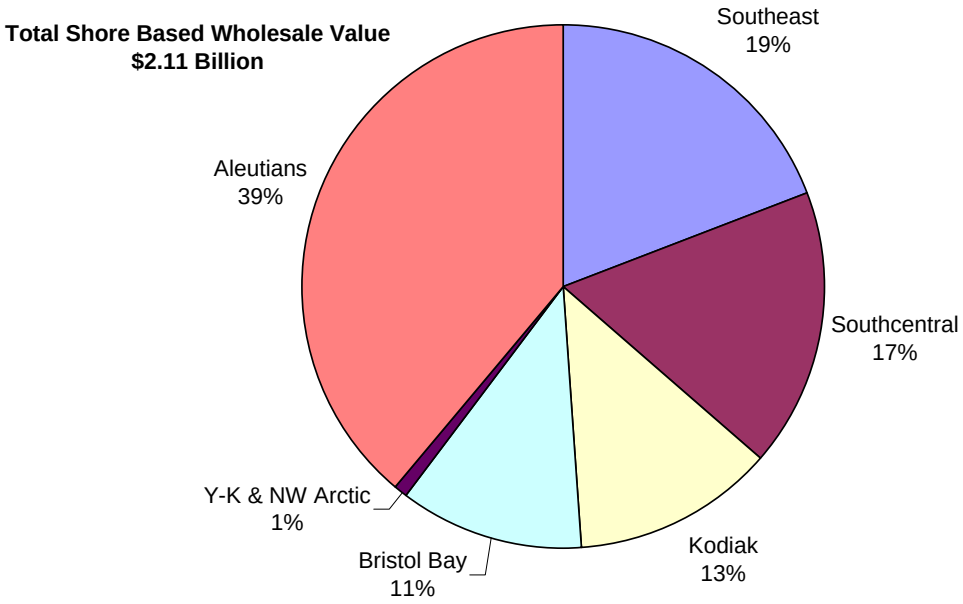
Note: Excludes ex-vessel payments by motherships, shore-based processing plants located outside of Alaska, and the imputed ex-vessel value of catcher processors.

Source: Developed by Northern Economics based on data from Hiatt (2008a).

4.6.2 First Wholesale Value in Alaska Regions

As shown in Figure 45, the Aleutian and Pribilof Islands region was also the largest region in terms of first wholesale value. The accounted for about 39 percent, or $821.9 million of the region's first wholesale value of shore-side processed seafood. The total wholesale value of Alaska seafood industry harvest for the regions were $2.11 billion in 2007, Southeast and Southcentral regions accounted for 19 and 17 percent this total.

Figure 45. Percentage of First Wholesale Value of Alaska Seafood Industry Harvest by Region, 2007



Note: Excludes wholesale value of catcher processors, motherships, and shore-based processing plants located outside of Alaska

Source: Developed by Northern Economics based on data from Hiatt (2008a).

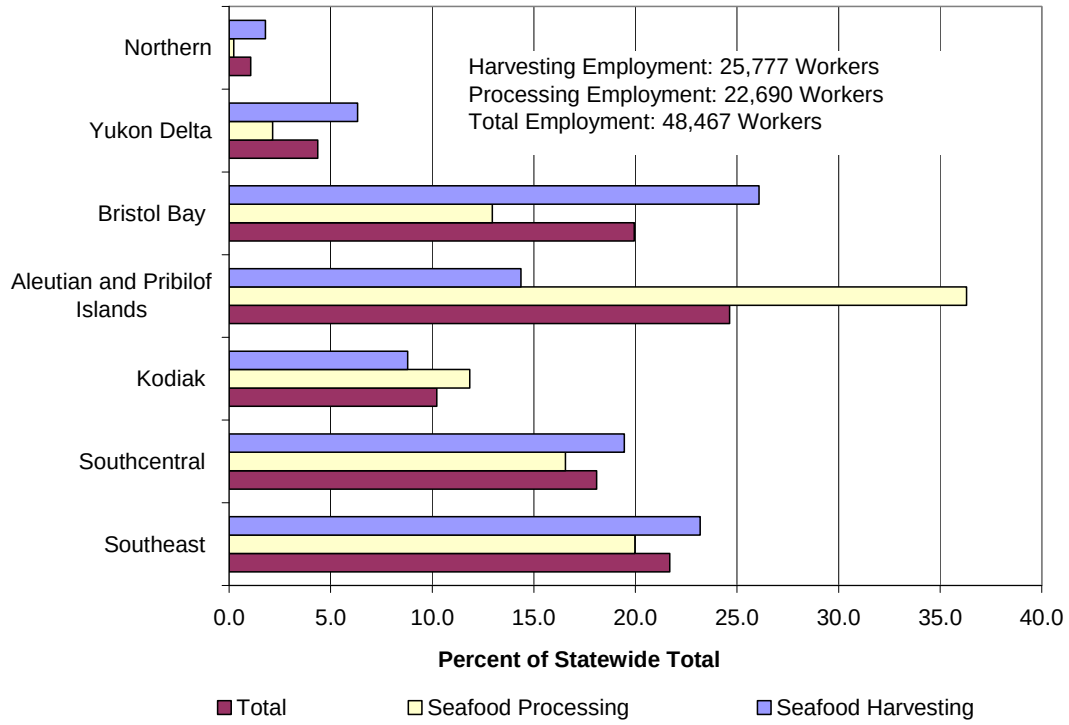
4.6.3 Seafood Employment in Alaska Regions

Figure 46 shows the number of workers employed in the shore-side seafood industry by region in 2006.[47] The Aleutian and Pribilof Islands region, with its concentration of large seafood processing facilities, accounted for 36.3 percent of the seafood processing jobs.[48] Bristol Bay accounted for a substantial portion of Alaska's seafood harvesting jobs due to the large salmon fisheries occurring in the region. The Southeast, Southcentral and Kodiak regions, which have sizeable harvesting as well as processing sectors, also made important contributions to statewide seafood industry employment. The figure shows percentages of Alaska Seafood processing and harvesting shore-side workforce by region, as well as percentage of the state's total seafood industry workforce by region. As an example, the figure shows that Bristol Bay has about 13 percent of Alaska's total seafood processing jobs, 26.1 percent of the state's total seafood harvesting jobs, and about 19.9 percent of the state's workforce in seafood harvesting and seafood processing combined.

[47] Seafood harvesting workforce estimates for 2007 were not available at the time this report was developed.

[48] Fishing ports in the Aleutian and Pribilof Islands region with large seafood processing facilities include Dutch Harbor-Unalaska (which has six processing plants), Akutan (where Trident Seafoods has the largest seafood processing operation in North America), Adak, Atka, King Cove, St. Paul, Port Moller, and Sand Point.

Figure 46. Percentage of Alaska Shore-side Processing and Harvesting Workforce by Region, 2006



Notes:

1) Workforce refers to the number of workers employed in an industry for any amount of time during the year.

2) Yukon Delta Includes data from the Bethel and Wade Hampton census areas; Northern includes data from the Denali, Fairbanks North Star, North Slope and Northwest Arctic boroughs and the Nome, Southeast Fairbanks and Yukon-Koyukuk census areas. Other regions are as shown in Figure 43.

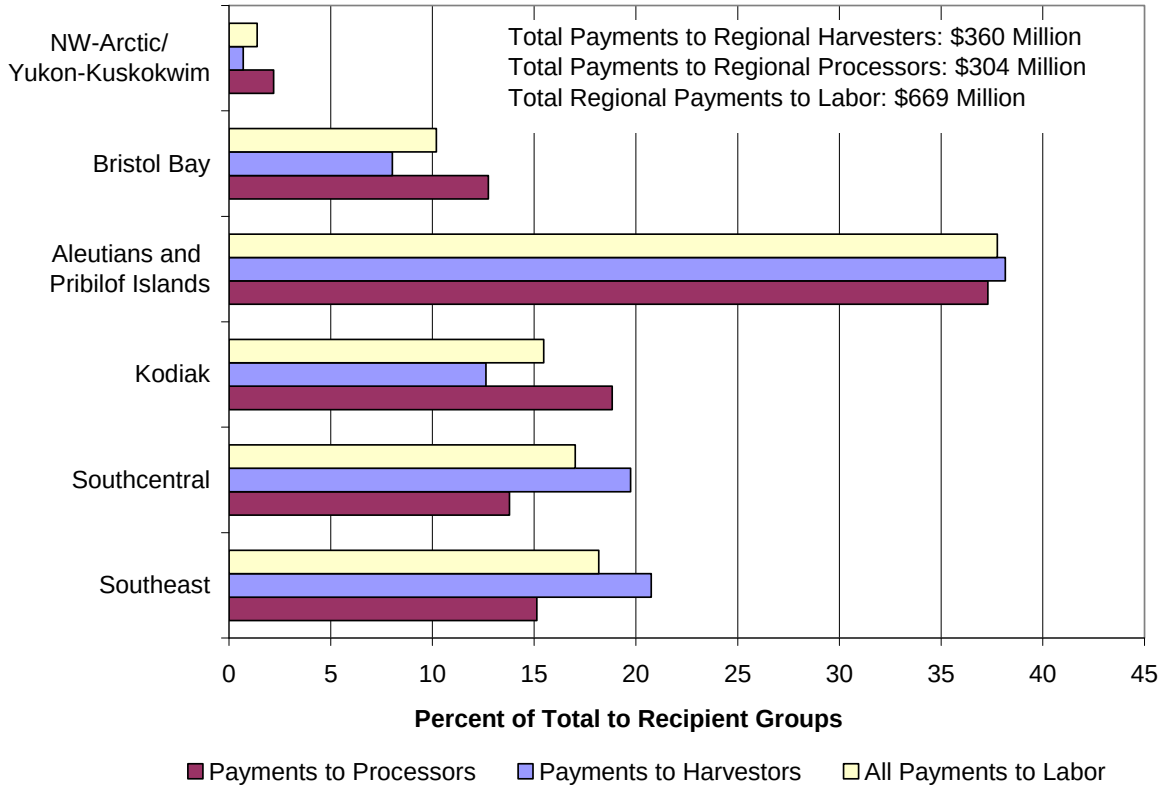
3) 2007 data are not available.

Source: Developed by Northern Economics based on data from ADOLWD (2007a).

4.6.4 Payments to Labor in Alaska Regions

Payments to harvesting and processing shore-side labor in 2007 within the Alaska regions were about $663.9 million in 2007. Figure 47 shows how these payments to labor were divided by regions in 2007. As with jobs, the Aleutian and Pribilof Islands region accounted for a major share of payments to labor in seafood industry with 38 percent of total payments to labor. The Southeast and Southcentral regions accounted for 18 and 17 percent respectively of total seafood payments to labor.

Figure 47. Percentage of Alaska Seafood Industry Payments to Labor by Region, 2007



Source: Developed by Northern Economics based on data from ADOLWD (2008b) and Hiatt (2008a).

4.6.5 Regional Importance of Alaska Seafood Industry

The economic importance of the seafood industry in Alaska goes beyond the value of products harvested and processed in the state each year. The estimated $3.65 billion of economic output generated by the shore-based seafood industry gives an indication of the economic importance of the industry. However, if the seafood industry were to go away, many communities would experience lasting effects.

One of the transportation challenges faced in Alaska is the high cost of bringing goods into the state. One of the factors causing these high transportation costs is the fact that the quantity of goods being shipped to Alaska by far exceeds the quantity of goods being shipped from Alaska. The lack of exports means that more of the round-trip transportation cost has to be covered by charges on imported goods sent than would be if the imports and exports were more balanced.

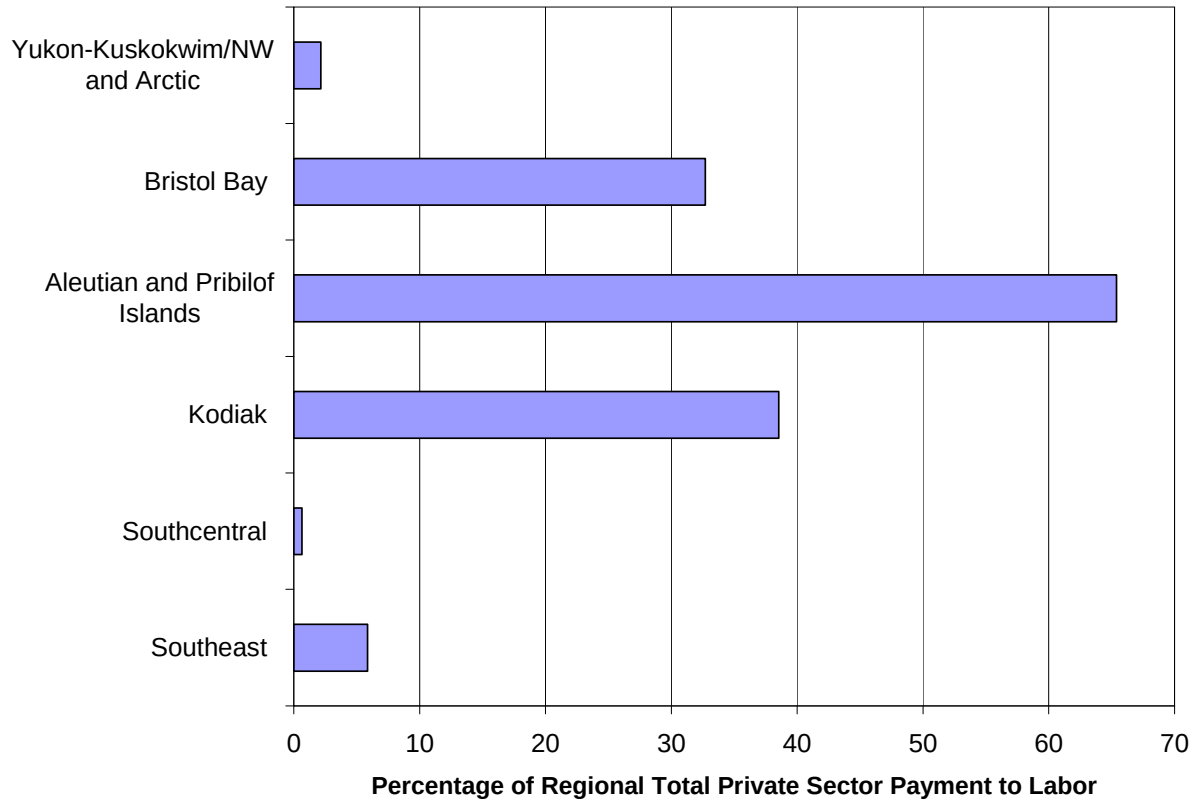
In communities where the seafood industry is established, seafood exports help to increase marine transportation activity and reduce transportation costs. The industry is also responsible for a substantial amount of air traffic as harvesting and processing workers travel to and from fishing areas with the

seasons. While the effect of the industry's presence is hard to quantify, if the seafood industry were to go away, many communities would likely see a decrease in transportation options and the frequency of trips, as well as an increase in the cost of those transportation linkages.

Many communities rely on the seafood industry as an important part of the tax base, including revenues generated from property taxes (both for processing facilities and equipment and for the year-round residents who are in the community due to their fishing employment), sales taxes (including for purchases made by seafood workers), and port charges (including dockage, wharfage, and moorage). From the private sector to the public sector, it is important to recognize that a closure of the seafood industry would have far-reaching implications.

This section describes the importance of the seafood industry by Alaska region in terms of employment and local government taxes. In many coastal areas of Alaska, seafood processing and harvesting provides a large proportion of jobs. Figure 48 shows the percentage of private sector payments to labor from Alaska Seafood Processing by region in 2007. Payments to harvesting labor have not been included as it is not reported in the ADOLWD data (see Section1.2). With the concentration of major fishing ports in the Aleutian and Pribilof Islands region, seafood processing accounted for 65 percent of all private sector payments to labor in 2007 (Figure 48). The seafood industry accounted for over 33 percent of payments to labor in Bristol Bay and 39 percent In Kodiak.

Figure 48. Percentage of Private Sector Payments to Labor from Alaska Seafood Processing by Region, 2007

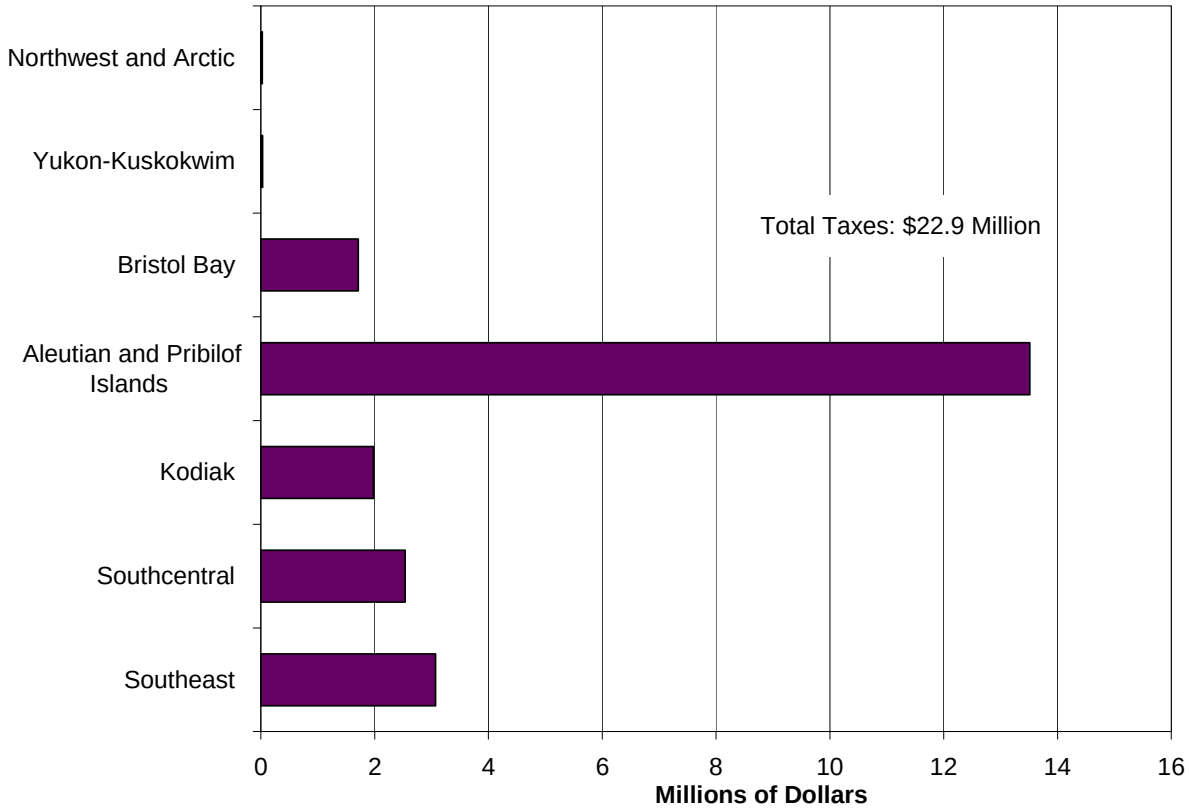


Note: The private sector excludes government and education labor, but includes labor in regional, village and tribal organizations.

Source: Developed by Northern Economics based on data from ADOLWD (2008b).

As discussed in Section 4.5.1, Alaska municipalities may receive fish-related tax revenues through programs which provide for an annual sharing of state fisheries business taxes and fishery resource landing taxes. Under these programs, the state shares 50 percent of such taxes with eligible local governments. The shared tax revenues are received by municipalities two years after the fishing season on which they are based. Figure 49 shows the distribution of this important source of local government revenues in 2006.

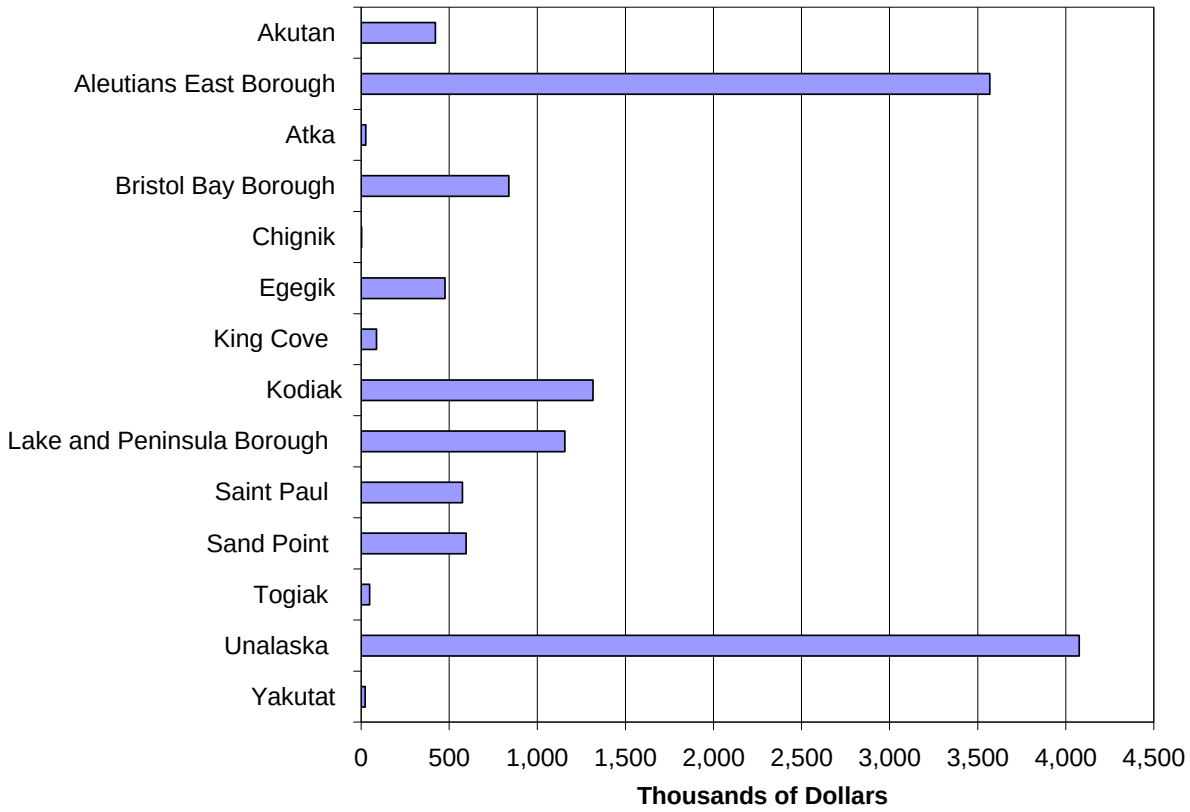
Figure 49. Distribution of Fisheries Business and Fishery Resource Landing Taxes by Region, 2006



Note: 2007 data were not available at the time of this publication.
Source: Developed by Northern Economics based on data from ADOR (2006b); ADCCED (2008a).

In addition to the shared state taxes collected from fishery resources, municipalities have the power to levy their own local tax on the sale of fish to processors, and many municipalities have chosen to do so (Figure 50). In the figure, the municipalities are listed in alphabetical order.

Figure 50. Alaska Seafood Industry-Related Municipal Taxes and Revenues by Municipality, 2007



Note: Chart only shows fish taxes, not property or sales taxes.

Source: Developed by Northern Economics based on data from ADCCED (2008b).

For many of the coastal communities within the important fishing regions discussed above, seafood harvesting and processing are often the only significant private sector activities, and fisheries taxes are the most important source of local government revenues. For example, the economy of the City of Unalaska, located in the Aleutians West Census Area, is based almost entirely on the seafood industry. The industry is the major source of employment, accounting for over 90 percent of jobs (Sepez et al. 2005). In FY 2006, $11,371,533, or 43 percent of Unalaska's general fund revenues, were derived from the city's share of the fisheries business tax and fishery resource landing tax and from its seafood sales tax (raw fish tax) (City of Unalaska 2006). [49]

Another way of assessing the economic dependence of Alaska municipalities on the seafood industry is to examine the fiscal impacts when fishery harvests decline. For instance, Scholz et al. (2007) described the effects of the sharp drop in Bering Sea snow crab landings (Section 2.3) on the fiscal condition of the City of St. Paul in the Pribilof Islands. In 1999, the operating revenue for St. Paul was $11,672 per capita. In 2000, after the snow crab fishery's sudden collapse, the operating revenue was $6,491 per capita, a decrease of almost 50 percent. The downturn in the snow crab fishery was also

[49] The City of Unalaska charges a general sales tax of three percent for the goods and services provided locally. Most of this revenue is derived from fuel sales to the fishing fleet and processing plants (City of Unalaska 2006).

matched by a steep decline in the city's population. More recently, the economy of St. Paul has appeared to be stabilizing due in large part to the community's participation in CDQ Program fisheries (Scholz et al. 2007). In short, it is no exaggeration to say that many communities in the Aleutian and Pribilof Islands region—and others scattered throughout much of coastal Alaska—would virtually disappear without fishing (Patton and Robinson 2006).

While the seafood industry is particularly important for rural coastal communities such as Unalaska and St. Paul, thousands of residents of Alaska's largest cities also fish or work in industries which provide support services to the seafood industry. According to CFEC counts of permit holders in 2006, the Municipality of Anchorage had the second highest number of permit holders of any Alaska borough or census area (the Kenai Peninsula Borough had the highest). Although Anchorage has its own fishing grounds (Cook Inlet), the majority of its permit holders actually fish in Bristol Bay, Kodiak or Cordova. In addition, Anchorage, with its concentration of businesses and transportation facilities, is an important service hub to Alaska's seafood industry and is a central distribution point for fresh Alaska seafood shipped to outside markets (McDowell Group, Inc. 2001; Sepez et al. 2005).[50]

4.7 Economic Impacts by Residency

This section describes the distribution of the economic impacts of Alaska's seafood industry among Alaska residents and nonresidents. This section relies heavily on ADOLWD data indicating the state of residence of shore-based processing workers (ADOLWD, 2007d). Since these data have not been updated for 2007 at the time of this publication, the entire section uses 2006 information for consistency.

4.7.1 Employment by State of Residence

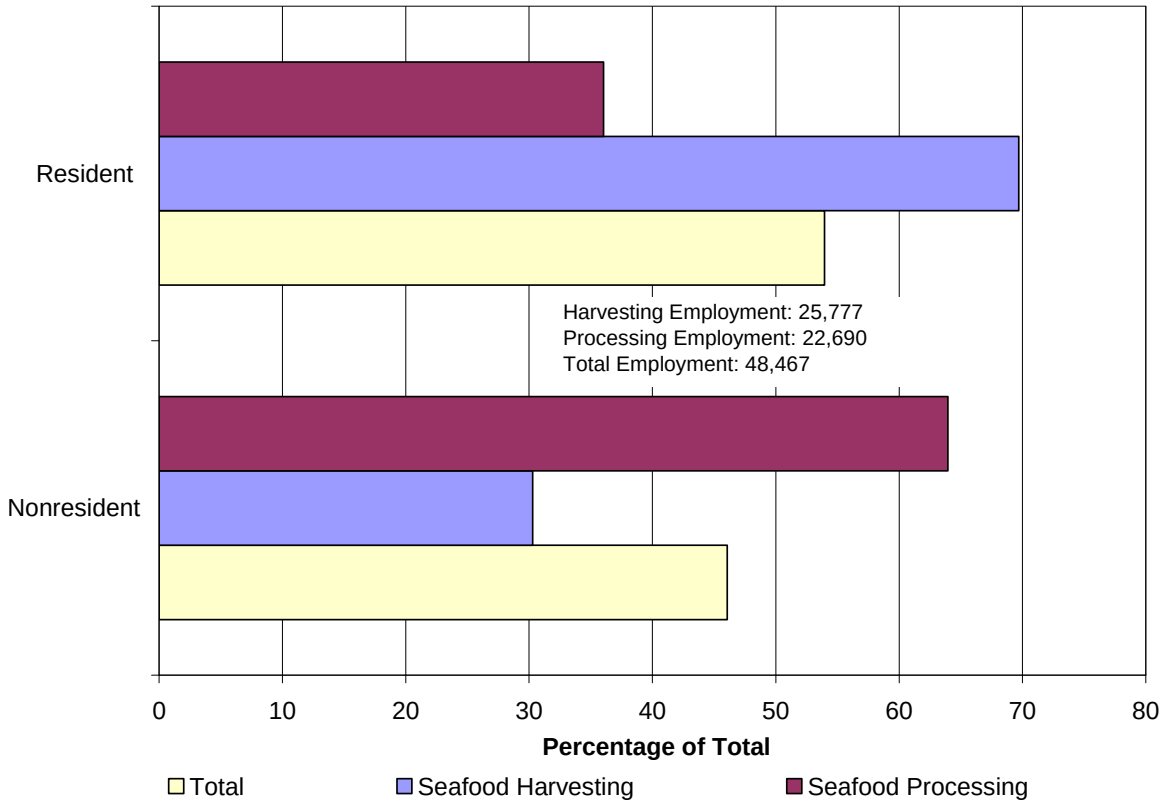
About half of the workers employed in Alaska's seafood industry in 2006 were residents of the state (Figure 51). The figure shows percentages of Alaska seafood processing and harvesting workforce by residency of worker, as well as percentage of the state's total seafood industry workforce by residency of workers. Residents account for 30 percent of the seafood processing labor, 70 percent of seafood harvesting labor, and 48 percent of total workforce in the Alaska seafood industry. Although the seafood processing sector generates thousands of jobs, it employs relatively few residents. According to data for 2006, only about one-third of the seafood processing workforce are Alaskans. In contrast, Alaskans accounted for about two-thirds of the harvesting labor force in the Alaska seafood industry.

Alaska's processing companies make significant efforts to hire Alaskan residents. According to industry sources, processing hire virtually every Alaskan that is willing to work, and that can meet the basic physical requirements of the job. The Division of Employment Security in ADOLWD runs a seafood industry web site that is dedicated to helping Alaskans find processing jobs (ADOLWD, 2007b). While

[50] The following excerpt from McDowell Group, Inc. (2001:1) highlights the importance of Anchorage as a fresh seafood distribution center: "For air shipments, seafood is either trucked or flown to Anchorage where it's distributed to Lower 48 markets on passenger and cargo flights. A very small quantity is shipped on dedicated cargo freighters. Fresh seafood that is trucked directly to outside markets originates primarily out of Homer, Seward, Kenai, and Valdez. Some fresh product is trucked or flown to Anchorage, then redistributed by truck to outside markets. This fresh product usually comes from Western Alaska waters, the Kodiak area, and Prince William Sound. A small amount of fresh seafood is trucked from other Southcentral communities to Anchorage, then loaded on container ships for delivery to Tacoma, Washington. In addition, some fresh salmon is shipped out of Cordova using a landing craft to Whittier, where it is loaded on a truck, delivered to Anchorage and positioned on the ship."

there are plenty of seafood processing jobs available, Alaskan workers tend not to apply for these jobs, preferring instead to work in the harvesting sector.

Figure 51. Percentage of Alaska Shore-side Processing and Harvesting Workforce by Residency, 2006

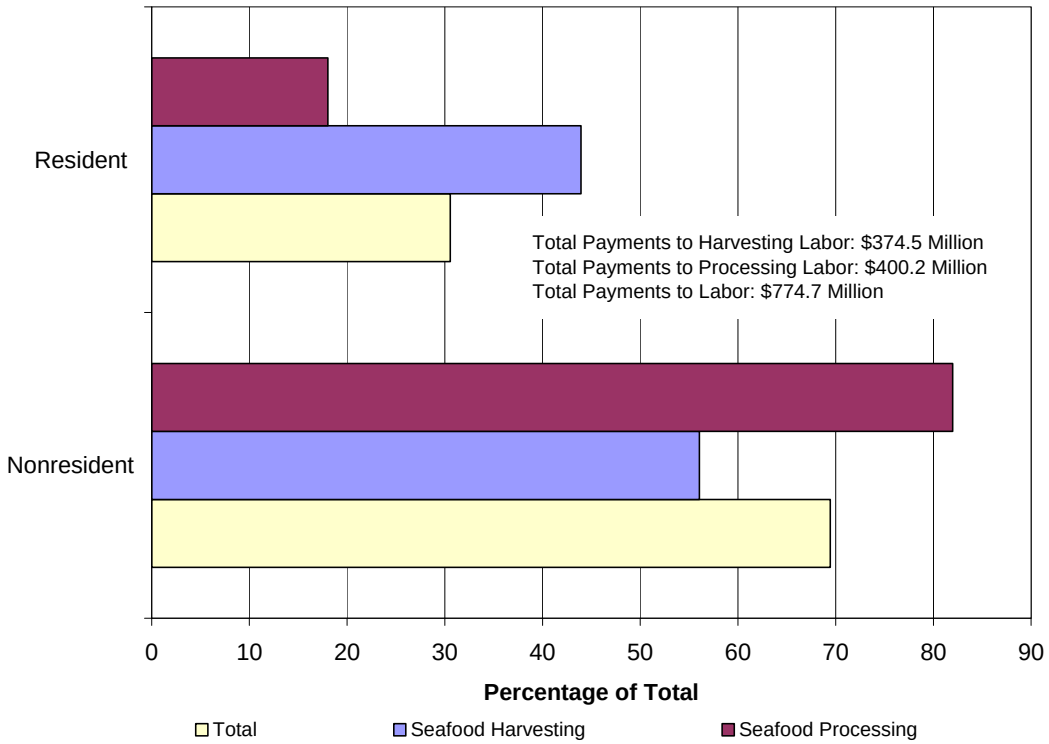


Source: Developed by Northern Economics based data from ADOLWD (2007d; 2007e).

4.7.2 Payments to Labor

In 2006, nonresident seafood processing workers earned about $328 million (82 percent) of the $400.2 million paid to all seafood processing workers (Figure 52). About 56 percent of the payments to labor in the harvesting sector, totaling around $209.9 million, went to nonresidents. As noted in Section 4.7.1, data from ADOLWD indicate that most fish harvesting jobs in Alaska are held by residents; however, non-residents earn a greater share of the payments to labor than residents. This is because non-residents hold a significantly higher proportion of the positions in the lucrative Pollock and crab fisheries, while Alaskan harvesters are the vast majority in less lucrative or short term fisheries such the salmon fisheries.

Figure 52. Percentage of Alaska Shore-side Processing and Harvesting Payments to Labor by Residency of Worker, 2006



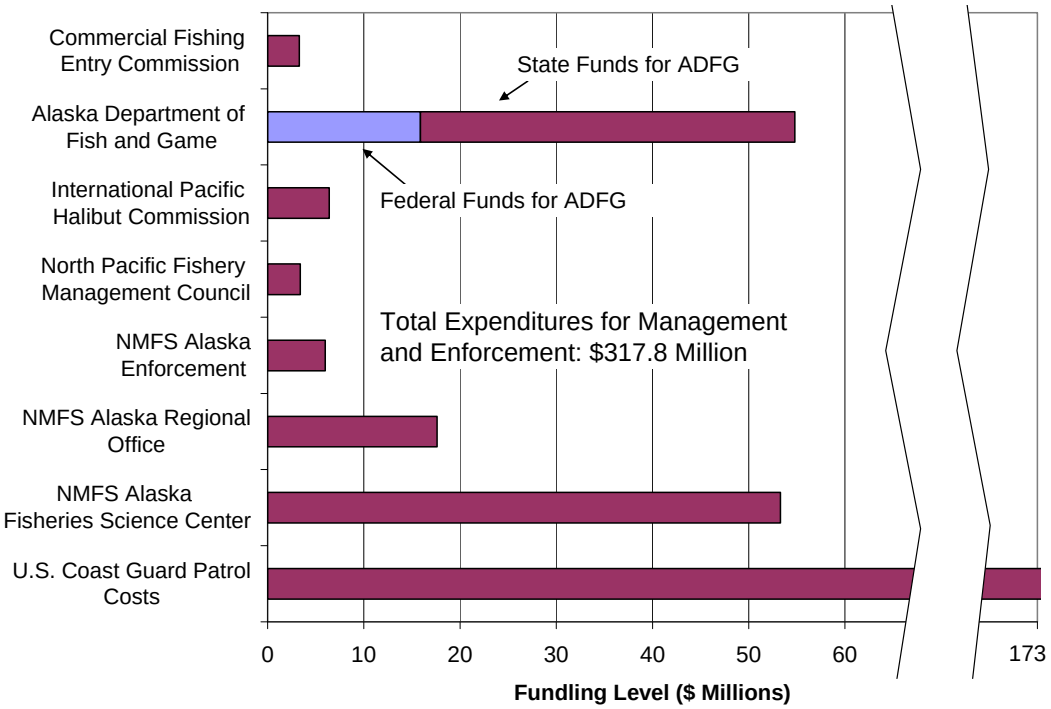
Source: Developed by Northern Economics based on data from ADOLWD (2007d, 2007e) and Hiatt (2008a).

4.8 Economic Impacts of Commercial Fisheries Management, Enforcement, and Research

The development of Alaska's commercial fisheries over the past 130 years has been accompanied by the establishment of increasingly complex management regimes designed to ensure the biological and economic health of those fisheries. State of Alaska and federal agencies have spent considerable funds to conduct stock research, make fishery management decisions, and enforce those decisions. This section examines the current level of expenditures on commercial fisheries management in Alaska. Expenditures for marketing and business development programs for Alaska's commercial fisheries are not included in this discussion, nor are expenditures for research outside of government agencies.

Estimates of state and federal expenditures in support of Alaska commercial fisheries management and research in 2006 are presented in Figure 53. The total amount spent was about $317.8 million.

Figure 53. State and Federal Expenditures for Alaska Commercial Fisheries Management, 2006



Source: Developed by Northern Economics based on data from ADF&G (Undated), Bruce (2008), Ferrero (2008), Jones (2008), Leman (2008); Oliver (2008), Penrose (2008), Paterni (2008), Ragone (2008).

Expenditures by the ADF&G Division of Commercial Fisheries were about $54.8 million (ADF&G undated). Federal funding, including significant amounts from Congressional earmarks, accounted for 29 percent of these expenditures. In 2006, the Division of Commercial Fisheries employed 303 full time staff and 508 seasonal workers (ADF&G undated). The Alaska Commercial Fisheries Entry Commission (CFEC), which issues permits and vessel licenses to qualified individuals in limited entry and other fisheries, had an operating budget in 2006 of approximately $3.3 million (Penrose, 2008). Tax revenues generated by the seafood industry exceeded state expenditures on commercial fisheries management and research in FY 2006 (Section 4.5.1).

Tracking federal expenditures for Alaska commercial fisheries management and research is difficult because these expenditures are spread across several entities, some of which are not located in Alaska and/or have functions besides fisheries management and research. Some management and research functions are performed by the NMFS Alaska Regional Office based in Juneau. This NMFS regional office had an annual operating budget of about $17.6 million in 2006 and a staff of 121 (Jones, 2009). However, most of the federally funded research on living marine resources in the waters off Alaska is conducted by the NMFS Alaska Fisheries Science Center, which is based in the NOAA Western Regional Center's Sand Point Facility in Seattle. The operating budget for the Alaska Fisheries Science Center in 2006 was around $53.3 million (Ferrero 2008). The North Pacific Fishery Management Council, which oversees management of most groundfish fisheries in the waters off Alaska and jointly manages Bering Sea crab fisheries, had an annual operating budget in 2006 of about $3.4 million and a staff of 15 (Oliver 2008).

NMFS Office for Law Enforcement, which is involved in the enforcement of fisheries management regulations in the EEZ, has offices in Juneau, Anchorage, Homer and Petersburg. Fully staffed, these Alaska offices operate with 17 Special Agents and 15 Enforcement Officers. Their total budget was

about $6.0 million in 2006 (Paterni, 2008). The Alaska State Troopers assist the NMFS Office for Law Enforcement by using Troopers and Public Safety Technicians to carry out dockside boardings and inspections and at-sea patrols. The State of Alaska conducts these duties under authority through a Cooperative Enforcement Agreement and is funded through Joint Enforcement Agreements. NOAA Office of General Counsel provides legal advice and counsel to NMFS and has an office in Juneau; however, the agency is unable to provide a breakdown of expenses specifically related to fisheries management (Pollard, 2008).

A significant of portion of the 17th Coast Guard District's efforts in Alaska is related to seafood industry commercial fishing support either directly or indirectly. The 17th District office in Juneau and Sector Commands in Juneau, Anchorage, and Valdez provide the command and control for Alaska operations.

In 2006, direct fishery law enforcement included: 624 large cutter patrol days, 1,160 aircraft patrol hours, and 279 patrol boat days—all at an estimated cost of over $173,000,000 using standard cost factors[51]. Direct fishery law enforcement efforts includes patrols of the fishing grounds, sensitive marine mammal and essential fish habitat, disputed maritime borders in the Bering Sea and Dixon Entrance, the "Donut Hole" in the Central Bering Sea, and the high seas driftnet areas in the North Pacific. In addition, the Coast Guard conducts a robust boarding program to ensure compliance with fishery, marine mammal, safety, and immigration rules; 748 fishing vessel boardings were conducted in 2006. Cutter patrols in Alaska are routinely augmented by high endurance cutters based on the West Coast and Hawaii. In addition, Canadian Forces conduct high seas drift net patrols in coordination with the Coast Guard.

Three medium endurance cutters – STORIS, ACUSHNET, and ALEX HALEY—are based in Alaska for the primary purpose of fishery enforcement. Six 110' patrol boats spend considerable time on enforcement. In addition, the air stations at Kodiak and Sitka provide both law enforcement patrols and search and rescue (SAR). The Kodiak Fishery Training Center has 15 personnel dedicated to supporting the fishery mission and the 17th District staff in Juneau has four dedicated personnel, with 6 more inspectors stationed at the Sectors or Marine Safety Detachment. These inspectors, along with other personnel, conducted nearly 1,100 fishing vessel safety exams in 2006, and issued approximately 700 safety decals to those vessels which passed their exams as part of this voluntary program. Small boat stations in Ketchikan and Juneau routinely enforce IFQ regulations. Four HH65 helicopters with 53 personnel are based in Kodiak for the primary purpose of supporting fisheries enforcement. The total number of personnel primarily dedicated to fishery enforcement is 321.

Six buoy tenders maintain aids to navigation in ports and waterways important to commercial fishing and transport of fish products or supporting logistics. Marine safety personnel support commercial fishing and processing through safety and pollution prevention and response programs. In addition to short range aids to navigation, seven LORAN stations provide electronic navigation. Support centers in Kodiak and Ketchikan provide logistical, medical, and engineering support to the operating forces in Alaska.

In 2006, approximately 2,550 active duty, reserve, and civilian Coast Guard personnel were based in Alaska[52]. It is difficult to estimate the exact proportion of personnel dedicated to commercial fishing enforcement and the economic activity they and their families generate in addition to the economic

[51] Computed from 17th Coast Guard District 2006 year in Review Report to the North Pacific Fishery Management Council and Commandant Instruction 7310.1J

[52] USCG Alaska Fact Sheet (2006)

activity generated by Coast Guard units; however, a conservative estimate is that 765 or 30 percent or more of total personnel are based in Alaska as a result of commercial fishing.

It is estimated that management of Alaska halibut fisheries represented about $6.4 million of IPHC's total annual expenditures in 2006 (Leman 2008).

State and federal expenditures toward commercial fisheries management and research directly support the functions of the institutions carrying out the research. In the case of universities, research funds support faculty investigators, student assistants and others directly involved in the research activity. The administration of research projects and various research-supporting activities generate additional permanent and temporary positions within the universities. In the case of other institutions, such as ADF&G and NMFS, fisheries management and research money is a primary source for funding the employment of in-house researchers, supporting staff and other workers.

It is also important to discuss federal research programs that are not directly related to Alaska commercial fisheries but are intended to indirectly benefit those fisheries. Most notable among these programs is the Steller sea lion research program, which was expanded out of a concern that the Alaska groundfish fishery might face costly restrictions as a result of scientific uncertainty about the fishery's role, if any, in the decline of the Steller sea lion population (NMFS 2007a). It was hoped that with this program the fishery could remain open while, simultaneously, more research and protection of Steller sea lion could occur.[53] Between FY 2000 and FY 2006, a total of $166.75 million was appropriated for Steller sea lion research and management through Congressional earmarks or the NMFS budget (NMFS 2007a).[54] Although much of this funding has been channeled into institutions outside of Alaska, several in-state entities have also been recipients, including ADF&G, NPFMC, Alaska SeaLife Center, University of Alaska Fairbanks, Alaska Fisheries Development Foundation and Prince William Sound Science Center (NMFS 2007a).

Research-related spending not only generates jobs and income in the entities that are recipients of the research funds, it can have a "ripple" economic effect throughout a region. For example, research funding can benefit a large variety of businesses in the private economy by providing funding recipients with procurement budgets that allow them to purchase research-related equipment, supplies and services (e.g., computer components and other high-tech equipment, professional and maintenance services, travel services, aircraft and vessel charters and printing and photographic services). The periodic convening of researchers at research symposia and workshops can also benefit private businesses in the service sector, such as hotels and restaurants. In addition, the majority of the wages and salaries of researchers and other research-related workers circulate back into the local economy through purchases of local goods and services, thereby providing a foundation for other jobs in the retail and service sectors.

[53] NMFS (2007a:3-31) summarized the importance of the Steller sea lion research program to Alaska commercial fisheries as follows: "Several of the largest U.S. fisheries operate within the range of the [Steller sea lion]; the fisheries' role, if any, in the decline of the western [Steller sea lion population] remains both a topic of debate … and a significant issue for ongoing litigation (*Greenpeace et al. v. NMFS and At-Sea Processors et al., Civ. No. C98-0492-C*). On the one hand, if fisheries play a significant part in the decline and lack of recovery, then actions should be taken to avoid those effects. On the other hand, if fisheries do not impede recovery, then the economic viability of those fisheries should not be unnecessarily compromised by regulations or other legal requirements related to protection of [Steller sea lions]. In either case, [Steller sea lion] scientific information is critical to the future of both the [Steller sea lion] population and commercial fisheries in Alaska."

[54] The budget for Steller sea lion research (including research outside of government agencies) since 2001 has been the largest for a species listed as threatened or endangered under the U.S. Endangered Species Act (Holmes et al. 2006).

4.9 Economic Impacts of the Western Alaska Community Development Quota Program

As described in Chapter 2, the full development of the domestic fishing and processing sectors in the BSAI fisheries between 1976 and 1990 generated substantial wealth; however, little of that wealth flowed to the small, rural villages along the coast of western Alaska. While the communities bordered some of the richest fishing grounds in the world, the high capital investment required to compete in these large-scale, industrialized fisheries precluded small communities from participating in their development.[55] This concern provided part of the impetus behind the creation of the Community Development Quota (CDQ) Program (National Research Council 1999; Northern Economics 2002).[56]

This section describes the economic effects of the CDQ Program with respect to revenues, royalties, assets, employment and wages. The most recent year for which data are available is 2005—annual CDQ statistics have not been compiled and published by the State of Alaska or NMFS after 2006 amendments to the CDQ provisions of the Magnuson-Stevens Act altered the administrative aspects of the CDQ Program, including the CDQ reporting requirements and oversight roles of NMFS and the state.[57] To show how the CDQ Program has developed since its inception, this section includes historical information as well as the most current update.

The CDQ Program was created by the NPFMC in 1992 as part of the inshore/offshore allocations of pollock in the BSAI fishery. Initially, the CDQ Program set aside 7.5 percent of the BSAI's annual total allowable catch for pollock for allocation to qualifying communities. Over the years, the CDQ Program expanded to become multi-species in nature, encompassing both groundfish and non-groundfish fisheries.

Currently, 65 communities located along the Bering Sea are eligible for the CDQ Program. These communities are aligned into six CDQ groups: Aleutian Pribilof Island Community Development Association, Bristol Bay Economic Development Corporation, Central Bering Sea Fishermen's Association, Coastal Villages Regional Fund, Norton Sound Economic Development Corporation, and Yukon Delta Fisheries Development Association.

The total net income generated by the CDQ Program from 1992 through 2005 was approximately $362 million (Figure 54). Initially, program revenues were from royalties obtained from leases of quota species. Between 1992 and 2005, approximately $454 million were generated from these royalty payments (Figure 55). Eventually, revenues were obtained from other sources such as investments and other business activities. Revenues minus royalty income for the program, 1992 through 2000, were equal to nearly $318 million. The dramatic increase in CDQ revenues in 2004 was due, in part, to investment payouts to several CDQ groups, high pollock and crab prices, and

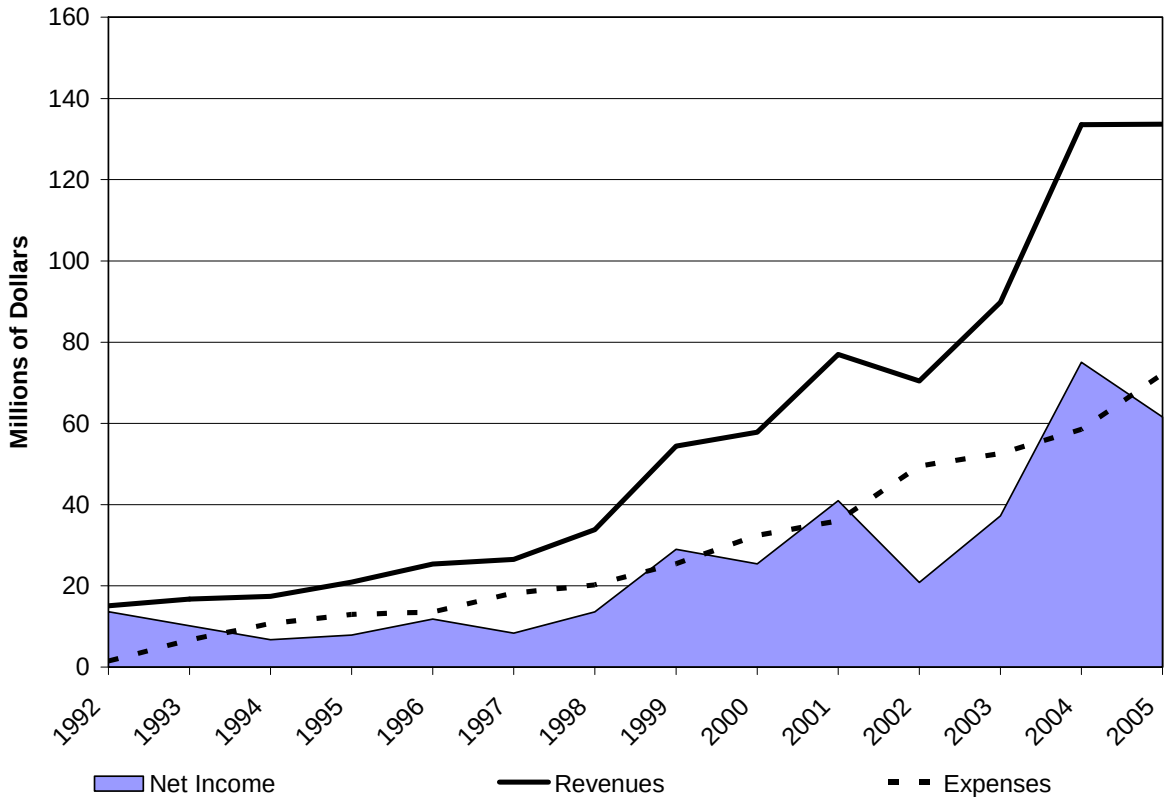
[55] The economic barriers to participation in the offshore groundfish fishery are summarized by ADCCED (undated) as follows: "Involvement in Alaska's groundfish fishery operations requires considerable investment and expertise. Factory trawler companies are multimillion-dollar operations. Their employees must possess sophisticated business and technical skills to compete in the industry. These companies not only employ seasoned captains, engineers, plant managers, maintenance crews, deckhands and processors, but headquarters are staffed with accountants, human resource professionals, administrators, lobbyists, marketing arms and sales forces."

[56] As defined by section 305(i)(1)(A) of the Magnuson-Stevens Act, the purpose of the CDQ Program is to 1) provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the BSAI Management Area; 2) support economic development in western Alaska; 3) alleviate poverty and provide economic and social benefits for residents of western Alaska; and 4) achieve sustainable and diversified local economies in western Alaska. The communities in western Alaska are predominantly Alaska Native villages.

[57] The CDQ provisions of the Magnuson-Stevens Act were amended by the Coast Guard and Maritime Transportation Act of 2006.

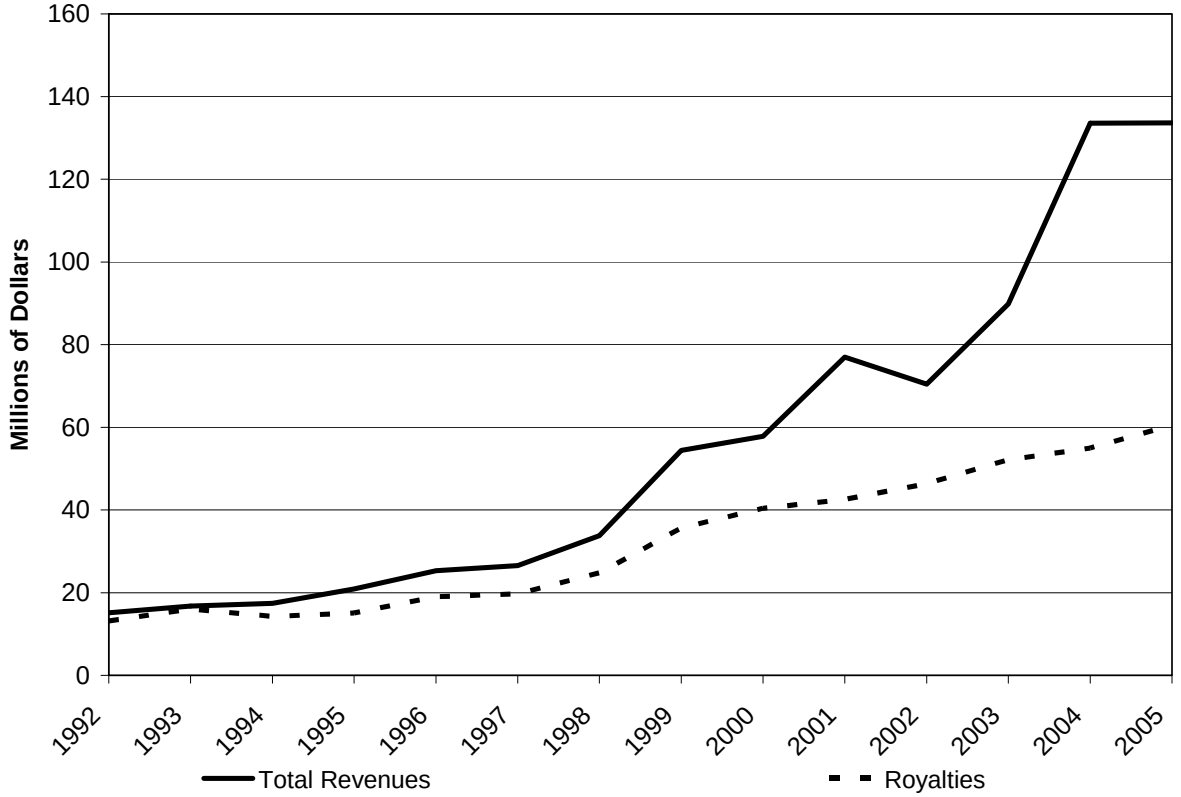
some increase in royalty revenues. Investment payouts affected only a few groups, while price increases and royalty revenues impacted all six groups (SWAMC 2007).

Figure 54. CDQ Program Revenues, Expenses and Net Income, 1992–2005



Source: Adapted by Northern Economics from ADCCED, 2006a.

Figure 55. CDQ Program Royalties and Revenues, 1992–2005

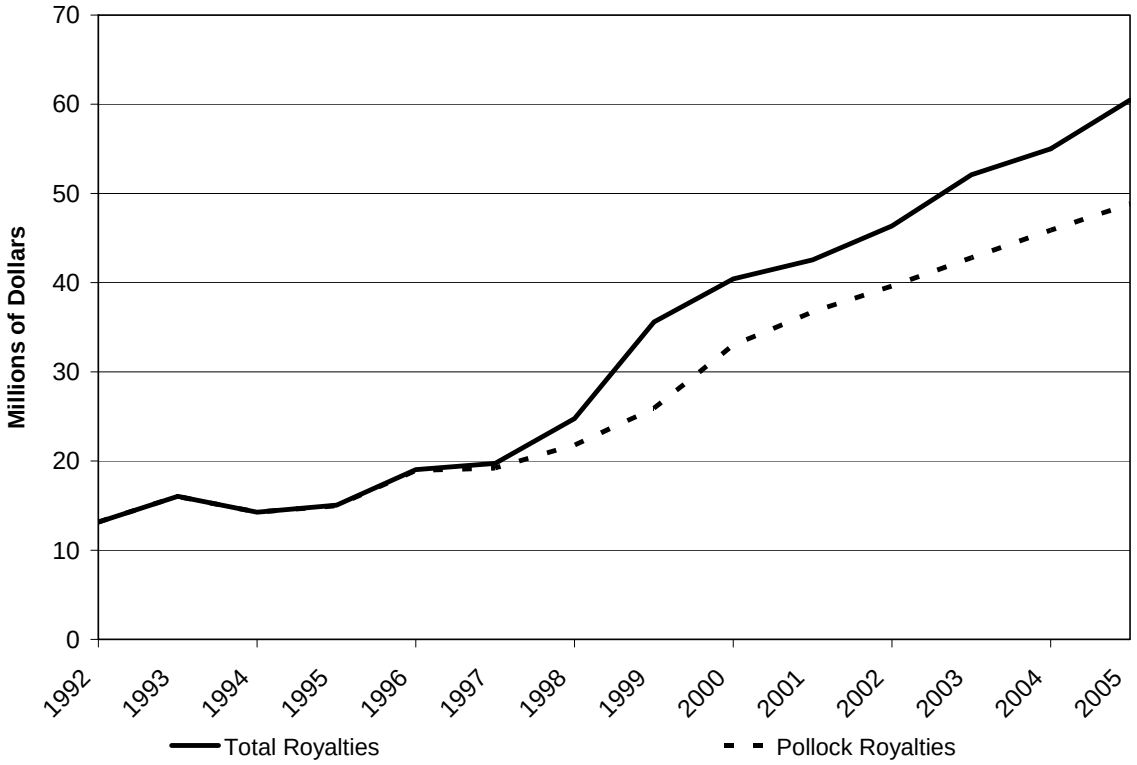


Source: Adapted by Northern Economics from ADCCED, 2006b.

Over the duration of the CDQ Program, annual pollock CDQ royalties have consistently exceeded $13 million (Figure 56). In 2005, the CDQ groups received nearly $49 million in pollock CDQ royalties, while royalties from the multi-species program provided the groups an additional $11.7 million. The revenue stream from the lease of CDQ allocations has permitted the CDQ groups to make substantial fisheries-related investments. The value of CDQ group assets in aggregate increased from about $13.3 million in 1992 to over $415 million in 2005 (Figure 57). The CDQ groups have acquired ownership interests in the at-sea processing sector and catcher vessels. In addition, some CDQ groups have invested in inshore processing plants, motherships, and catcher-processors that operate in the crab, halibut and groundfish fisheries. A number of CDQ groups have also promoted investment in local, small-scale fishing operations targeting salmon, herring, halibut, or other species. For example, CDQ groups have channeled significant resources toward local fisheries-related infrastructure development (Northern Economics, Inc. 2002). In 2004, CDQ earned income exceeded royalty revenues for the first time in program history, and earned income doubled royalty revenues in 2005. As CDQ groups continue to make investments in various fisheries assets, capacity for earned income will continue to increase in future years (SWAMC 2007).[58]

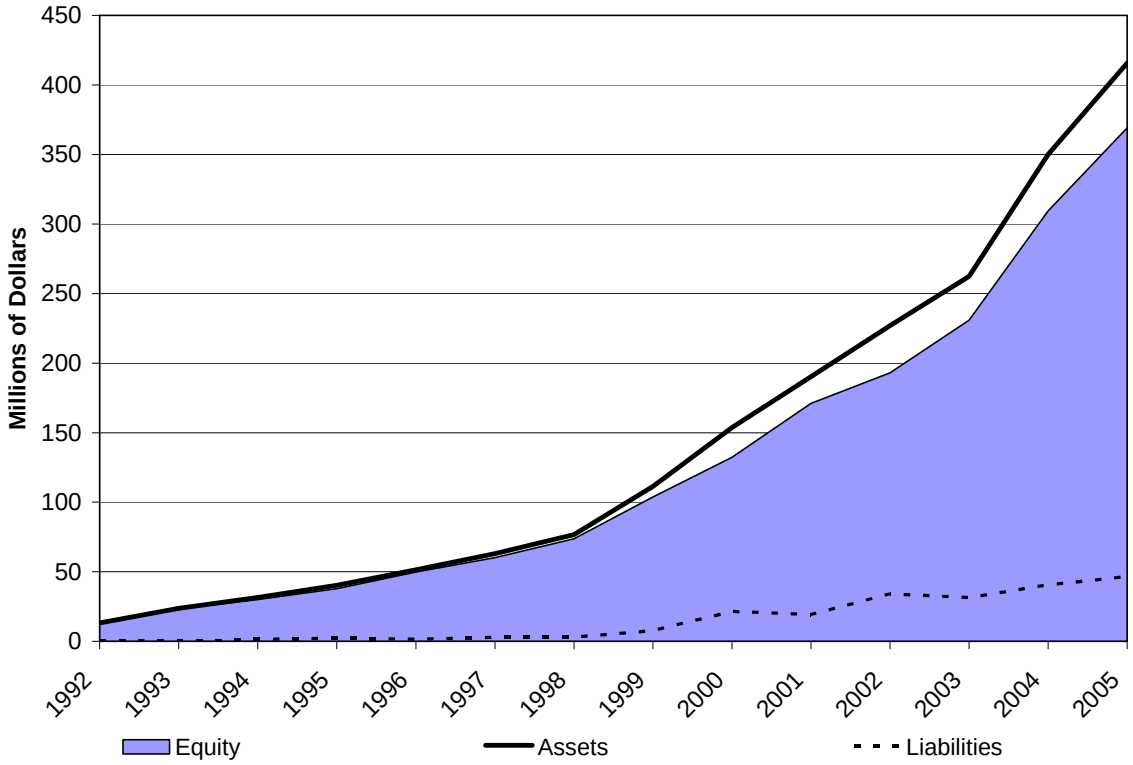
[58] In 2006, CDQ Program regulations were amended to allow CDQ groups to make up to 20 percent of their annual investments in projects that are not fishery-related, including matching grants or leveraging dollars with other agencies, foundations or non-profit projects, but only within the regions and communities that the CDQ groups serve.

Figure 56. CDQ Program Pollock Royalties and Total Royalties, 1992-2005



Source: Adapted by Northern Economics from ADCCED, 2006c.

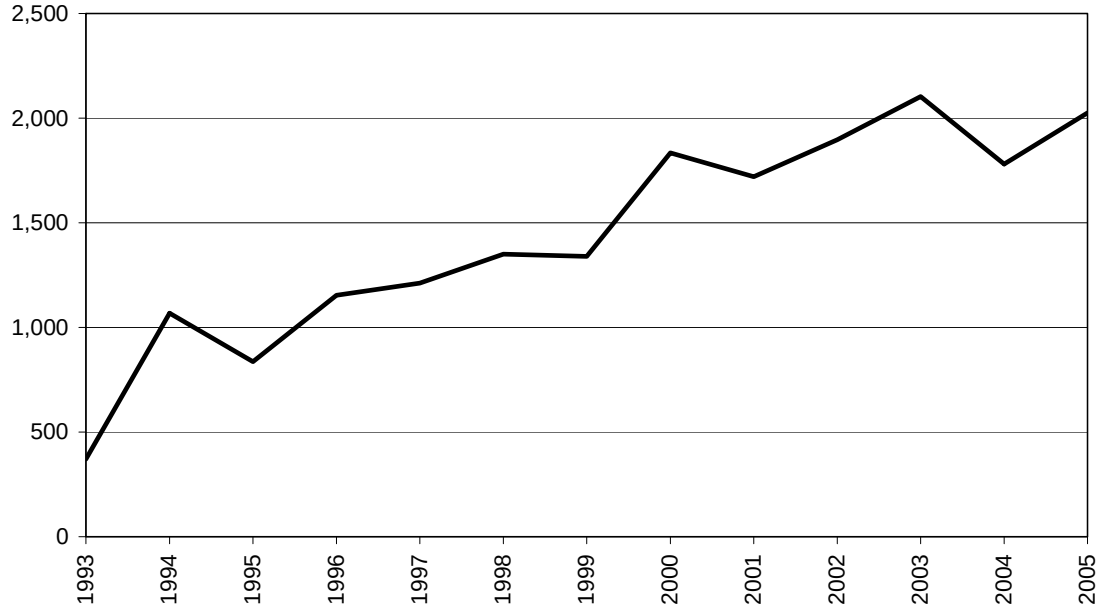
Figure 57. CDQ Program Assets, Liabilities and Equity, 1992–2005



Source: Adapted by Northern Economics from ADCCED, 2006d.

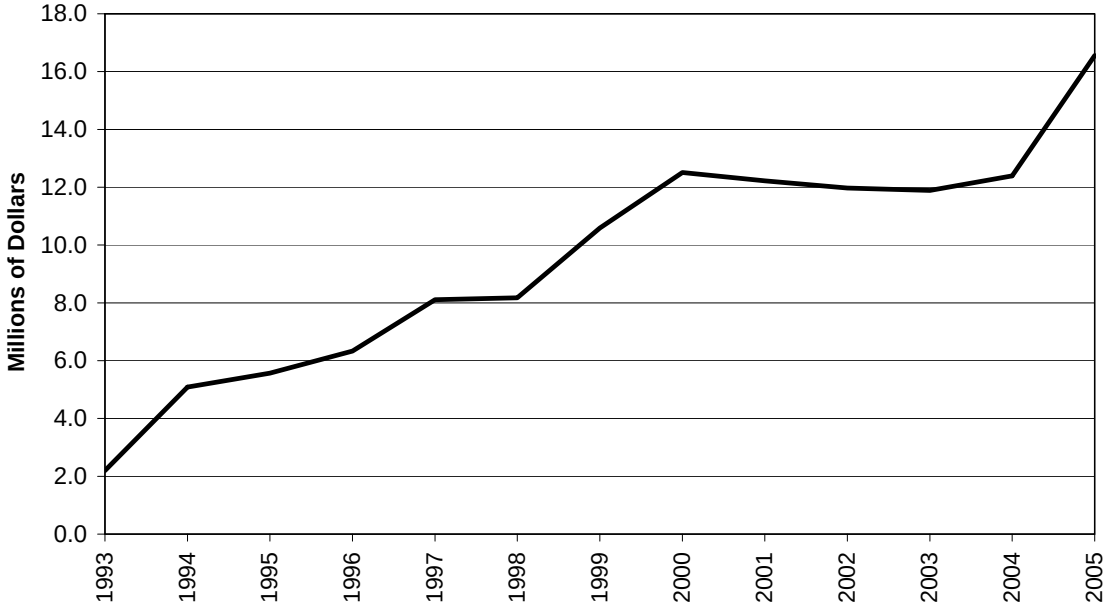
Employment opportunities have been one of the most tangible direct benefits of the CDQ Program (Figure 58). Jobs generated by the CDQ Program included work aboard harvesting vessels, internships with fishing industry partners or government agencies, work at processing plants, and management/administrative positions. The CDQ Program has created an excess of $123 million in wages annually since 1993 (Figure 59).

Figure 58. CDQ Program Employment, 1993–2005



Source: Adapted by Northern Economics from ADCCED, 2006e.

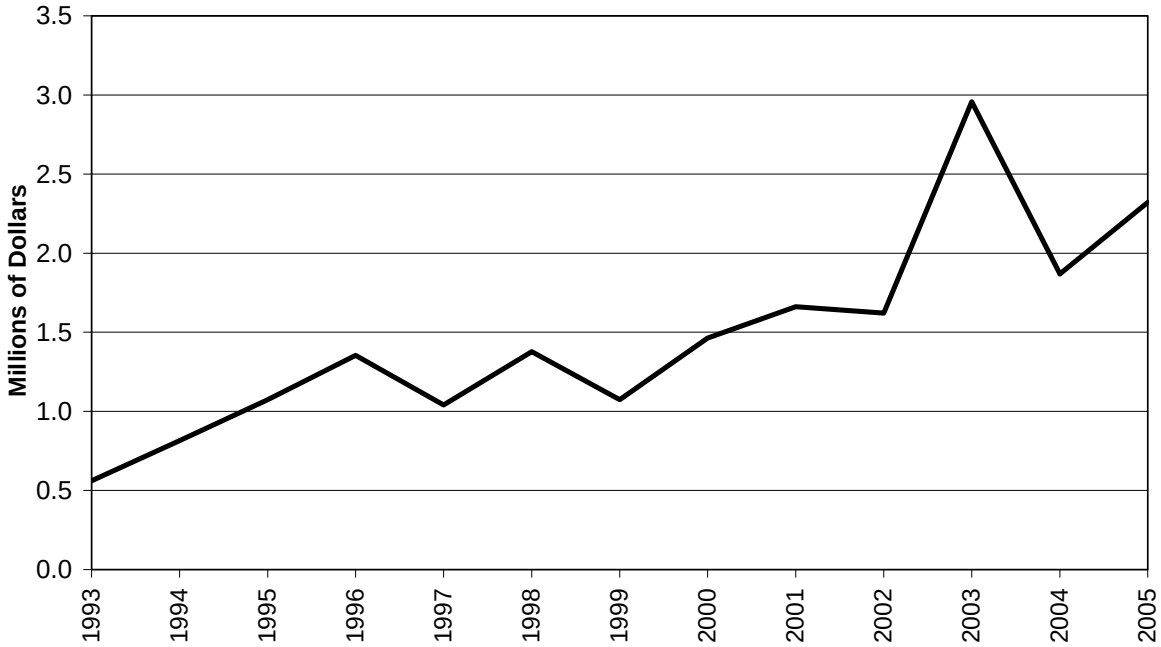
Figure 59. CDQ Program Wages, 1993–2005



Source: Adapted by Northern Economics from ADCCED, 2006f.

Training of CDQ community residents has been a primary objective for CDQ groups from the onset of the program and has been promoted as an essential means to developing a sustainable, locally-based fishery economy. Each CDQ group provides training for their residents based not only on the individual needs of the trainee, but also on the overall needs of the community (Northern Economics, Inc. 2002). Figure 60 shows CDQ group expenditures for training and education. According to CDQ group statistics compiled by ADCCED, approximately 13,350 people received training between 1993 and 2005 (there may be some double counting in this estimate because an individual can take advantage of more than one training program).

Figure 60. CDQ Program Training Expenditures



Source: Adapted by Northern Economics from ADCCED, 2006g.

Another important effect of the CDQ Program has been its "Alaskanizing" influence on the state's seafood industry (ADCCED 2002). Alaska's seafood processors are dominated by businesses headquartered out of state; few, if any, major "Alaska" shore-side facilities or at-sea catcher-processor vessels are headquartered in Alaska (ADCCED 2002). While the groundfish and crab fisheries continue to be dominated by Seattle-based companies, CDQ group investments in inshore processing plants, motherships and catcher-processors that operate in the crab and groundfish fisheries have significantly increased the participation of Alaska residents in those fisheries (Northern Economics, Inc. 2002). No other mechanism has been as successful as the CDQ program in promoting involvement of Alaskans in the harvest and processing of offshore Bering Sea fishery resources (ADCCED undated).

5 References

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). Alaska Economic Information System. Undated. Available at http://www.commerce.state.ak.us/dca/AEIS/AEIS_Home.htm.

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *Strategic Economic Concepts for the Alaska Fishing & Seafood Industry*. November 2002.

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *1992-2005 CDQ Revenues Expenses Net*. 2006a. Available at http://www.commerce.state.ak.us/bsc/CDQ/pub/CDQa_revenues.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *1992-2005 Total CDQ Royalties v. Revenues*. 2006b. Available at http://www.commerce.state.ak.us/bsc/CDQ/pub/CDQa_royalties.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED. *1992-2005 Pollock vs. Total CDQ Royalties*. 2006c. Available at http://www.commerce.state.ak.us/bsc/CDQ/pub/CDQa_pollock.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *1992-2005 CDQ Assets Liabilities Equity*. 2006d. Available at http://www.dced.state.ak.us/bsc/CDQ/pub/CDQa_assets.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *1993-2005 CDQ Employment*. 2006e. Available at http://www.commerce.state.ak.us/bsc/CDQ/pub/CDQa_employement.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *1993-2005 CDQ Wages*. 2006f. at http://www.commerce.state.ak.us/bsc/CDQ/pub/CDQa_wages.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *1993-2005 CDQ Training Expenditures*. 2006g. Available at http://www.commerce.state.ak.us/bsc/CDQ/pub/CDQa_training_expenditures.pdf

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). Alaska Economic Performance Report *2006*. June 2007a.

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). Alaska Office of Tourism Development, Tourism Research. 2007b. Available at http://www.dced.state.ak.us/oed/toubus/research.htm;

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *Fish Tax Payments*. 2008a. Available at http://www.dced.state.ak.us/dca/FinAid/Fish_Tax_Payments.xls

Alaska, Department of Commerce, Community, and Economic Development (ADCCED). *2007 Municipal Sales Tax, Special Tax and Revenues*. 2008b. Available at http://www.dced.state.ak.us/dca/osa/pub/07AKTax_Tab2.pdf

Alaska Department of Fish and Game (ADF&G). Alaska Commercial Salmon Catches, 1878-1986. August, 1987.

Alaska Department of Fish and Game (ADF&G). *2006 Overview*. Undated.

Alaska Department of Fish and Game (ADF&G). Alaska's Salmon Management. 2003a. Available at http://www.adfg.state.ak.us/special/salmonmngmnt.pdf

Alaska Department of Fish and Game (ADF&G). Alaska's Commercial Salmon Fishery. 2003b. Available at http://www.adfg.state.ak.us/special/salmonfishery.pdf

Alaska Department of Fish and Game (ADF&G). Groundfish Fisheries in Alaska. 2006a. Available at Available at http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/grndhome.php

Alaska Department of Fish and Game (ADF&G). Walleye Pollock Fisheries in Alaska. Available at http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/pollock/pollockhome.php. 2006b.

Alaska Department of Fish and Game (ADF&G). Overview of Alaska's Herring Fisheries. 2006c. Available at http://www.cf.adfg.state.ak.us/geninfo/finfish/herring/overview/overview.php.

Alaska Department of Fish and Game (ADF&G). ADF&G Press Release: ADF&G Releases Summary of the 2007 Salmon Season. 2007a. Available at http://www.adfg.state.ak.us/news/2007/11-7-07_nr.php.

Alaska Department of Fish and Game (ADF&G). Crab Fisheries in Alaska: Harvests, Effort, and Value. 2007b. Available at http://www.cf.adfg.state.ak.us/geninfo/shellfsh/crabs/crab_harvest.php.

Alaska Department of Fish and Game (ADF&G). Shrimp Fisheries in Alaska: Harvest and Status. 2007c. http://www.cf.adfg.state.ak.us/geninfo/shellfsh/shrimp/shrimp_harvest.php.

Alaska Department of Fish and Game (ADF&G). Scallop Fisheries in Alaska: Recent Harvests and Status. 2007d. Available at http://www.cf.adfg.state.ak.us/geninfo/shellfsh/scallops/scallop_harvest.php.

Alaska Department of Fish and Game (ADF&G). Herring Fisheries in Alaska: Harvest and Species Information. 2007e. Available at http://www.cf.adfg.state.ak.us/geninfo/finfish/herring/herring_harvest.php#catch.

Alaska Department of Fish and Game (ADF&G). Press Release: Alaska Salmon Fishery Re-Certified as Sustainable by MSC on. 2007f. Available at http://www.adfg.state.ak.us/news/2007/11-5-07_nr.php.

Alaska Department of Fish and Game (ADF&G). 1997 Alaska Commercial Herring Harvests and Exvessel Values. 2008a. Available at http://www.cf.adfg.state.ak.us/geninfo/finfish/h erring/catchval/97catch.php

Alaska Department of Fish and Game (ADF&G). Alaska Commercial Harvests of King, Tanner, and Snow Crab, 1953-2000. 2008b. Available at http://www.cf.adfg.state.ak.us/region4/shellfsh/crabs/1953-00.php

Alaska Department of Labor and Workforce Development (ADOLWD). Seafood Industry data. 2007a. Available at http://almis.labor.state.ak.us/cgi/databrowsing/?PAGEID=4&SUBID=300.

Alaska Department of Labor and Workforce Development (ADOLWD). Seafood Processing Jobs in Alaska. 2007b. Available at http://labor.state.ak.us/esd_alaska_jobs/process.htm.

Alaska Department of Labor and Workforce Development (ADOLWD). *Alaska Fish Harvesting Employment by Species 2000-2006*. 2007c. Available at http://www.labor.state.ak.us/research/seafood/statewide/AKAvgMonthlySpec.pdf

Alaska Department of Labor and Workforce Development (ADOLWD). *Seafood Processing Workforce and Wages by Borough or Census Area 2006*. 2007d. Available at http://www.labor.state.ak.us/research/seafood/statewide/AKSFPBorca.pdf

Alaska Department of Labor and Workforce Development (ADOLWD). *Fish Harvesting Workforce and Gross Earnings by Region, 2000-2005*. 2007e. Available at http://www.labor.state.ak.us/research/seafood/statewide/AKFHVWrkrErngReg.pdf

Alaska Department of Labor and Workforce Development (ADOLWD). *Nonresidents Working in Alaska 2006*. January 2008a.

Alaska Department of Labor and Workforce Development (ADOLWD). Quarterly Census of Employment & Wages. 2008b. Available at http://almis.labor.state.ak.us/?PAGEID=67& SUBID=300.

Alaska Department of Labor and Workforce Development (ADOLWD). *Wages*. 2008c. Available at http://almis.labor.state.ak.us/cgi/dataanalysis/AreaSelection.asp?tableName=Oeswage

Alaska Department of Revenue (ADOR). *Alaska Tax Division 2006 Annual Report*. 2006a.

Alaska Department of Revenue (ADOR). *Fiscal Year 2006 Shared Taxes and Fees Annual Report*. 2006b.

Alaska Department of Revenue (ADOR). Revenues Source Book. Fall 2007.

Alaska Department of Revenue (ADOR). Dividend Calculation. 2007b Available at http://www.pfd.state.ak.us/ forms/2006Forms/2006DividendCalculation.pdf.

Alaska Department of Revenue (ADOR). *2007 Annual Report*. 2008. Available at shttp://www.tax.alaska.gov/programs/sourcebook/index.aspx

Alaska Office of the Governor, *Palin Announces 12.6 percent Export Growth*. 2007. Available at http://www.gov.state.ak.us/archive.php?id=137&type=1.

Alaska Seafood Marketing Institute. Latest Research Reveals Powerful Evidence for Menuing Alaska Seafood. April 2006. Available at http://www.alaskaseafood.org/about/pressreleases/ASMI_brand_toolkit.htm.

Alaska State Library. Statewide Library Electronic Doorway. FAQ Alaska-Frequently Asked Questions About Alaska. Chronological History of Alaska. 2006. Available at http://sled.alaska.edu/akfaq/akchron.html.

American Seafoods Group LLC. Form S-4 Registration Statement under the Securities Act of 1933. 2002.

American Seafoods Group LLC. Controlling Ownership of American Seafoods Acquired by Company's Management Group and Alaskan Partner. February 27, 2006. Available at http://www.americanseafoods.com/DocumentDropPressReleases/20060227%20Controlling%20Ownership%20of%20American%20Seafoods%20Acquired%20by%20Company%20Management%20Group%20and%20Alaskan%20Partner.pdf.

American Seafoods Group LLC. Overview. 2007. Available at http://www.americanseafoods.com/about_overview.asp.

At-Sea Processors Association. What You Need To Know About Working On An At-Sea Processor. 2006. Available at http://www.atsea.org/working_on_processor.php.

Bauman, Margaret. "Low-cost Chinese Labor Could Spur Yukon Chum Fishery." *Alaska Journal of Commerce*. February 4, 2007.

Bering Select Seafoods Company. Marine Stewardship Council. 2007. Available at http://www.beringselect.com/msc.html.

Bowers, Forrest et al. *Annual Management Report for the Commercial and Subsistence Shellfish Fisheries of the Aleutian Islands, Bering Sea and the Westward Region's Shellfish Observer Program, 2004*. Alaska Department of Fish and Game, Fishery Management Report No. 05-51. September 2005.

Bromley, Daniel and Seth Macinko. *Rethinking Fisheries Policy in Alaska: Options for the Future. Prepared for Alaska Department of Fish and Game*. October 2007.

Bruce, Geron. Alaska Department of Fish and Game. Personal communication with Northern Economics. January 2008.

Cherry, Drew. "Groundfish Forum: Global Whitefish Supply to Fall 1.3%." *Intrafish*. November 2007.

Choy, Yeong. "NW Salmon Sent to China Before Reaching U.S. Tables." *The Seattle Times*. July 16, 2005.

City of Unalaska. City of Unalaska, *Alaska Comprehensive Annual Financial Report Fiscal Year Ending June 30, 2006*. 2006.

Colt, Stephen. *Salmon Fish Traps in Alaska: An Economic History Perspective*. ISER Working Paper 2000.2. February 2000.

Commercial Fishing Entry Commission (CFEC). *Permit & Fishing Activity by Year, State, Census Area or Alaskan City*. Accessed Available at http://www.cfec.state.ak.us/ fishery_statistics/earnings.htm. September 2008.

Cruise Line International Association. *The Contribution of the North American Cruise Line Industry to the US Economy in 2006*. 2006.

DiPietro, Ben. "The Great American Crab Grab." *Intrafish*. September 2007a.

DiPietro, Ben. "Will the ASMI Logo Become an Eco-label?" *Intrafish*. August 2007b.

Eaton, S. "Signs of Change: Fish Drift from Familiar Alaska Waters." *National Public Radio*. September 9, 2007.

EU Fish Processors' Association. *A.I.P.C.E. White Fish Study 2006*. September 2006.

Federal Fisheries Investment Task Force. *Report to Congress*. July 1999.

Ferrero, Rich. NMFS. Personal communication with Northern Economics, January 18, 2008;

Food and Agriculture Organization FA0. *FishStat Database*. Accessed September 2008. Available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

Fried, Neal. "Alaska Seafood Processing-A Growing Job Source?." *Alaska Economic Trends*. March 1996.

Fried, Neal. "The *Trends* 100." *Alaska Economic Trends*. July/August 2007.

Fried, Neal and Brigitta Windisch-Cole. "Kodiak." *Alaska Economic Trends*. September 1999.

Friedland, Jonathan. "Rivalries Grow for Global Fishers, As Fleets Expand and Hauls Wane." *The Wall Street Journal Interactive Edition*. November 25, 1997.

Gay, Joel. "Casting About for Solutions." *Alaska Business Monthly*. March 1 1992.

Gerjevic, Sandi. "The New Alaskeros: A Wave Of Hispanic Immigrants Taking Fish-Processing Jobs in Kodiak is Changing the Face of the City." *Anchorage Daily News*. October 11, 1998.

Gilbertsen, Neil. "Residency and the Alaska Fisheries." *Alaska Economic Trends* December 2004.

GLOBEFISH. "Alaska Pollock Market Report." October 2006.

Hartley, Marcus and Mark Fina, "Changes in Fleet Capacity Following the Introduction of Individual Fishing Quotas in the Alaskan Pacific Halibut and Sablefish Fishery." In Shotton, R. (ed.), *Case Studies*

on the Effects of Transferable Fishing Rights on Fleet Capacity and Concentration of Quota Ownership. FAO Fisheries Technical Paper 412. 2001.

Heard, William. "Alaska Salmon Enhancement: A Successful Program for Hatchery and Wild Stocks." In Nakamura, Y, J.P. McVey, K. Leber, C. Neidig, S. Fox, and K. Churchill (eds.). *Ecology of Aquaculture Species and Enhancement of Stocks*. Proceedings of the Thirtieth U.S.—Japan Meeting on Aquaculture. Sarasota, Florida, 3-4 December. UJNR Technical Report No. 30. Sarasota, FL. 2003.

Herrmann, Mark and Joshua Greenberg. *An International Market Model for Red King (Paralithodes camtschaticus), Blue King (P. platypus), Golden King (Lithodes aequispinus), Tanner (Chinoecetes Bairdi) and Snow (Chinoecetes opilio) Crab*. NPRB Project 423 Final Report and ADFG Final Report (NOAA Award NA17FN1273). June 2006.

Hiatt, Terry. NMFS. Data compilations from Commercial Annual Operator Reports (COAR Data) by special request from Northern Economics. September, 2008a.

Hiatt, Terry et al. *Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Islands Area: Economic Status of the Groundfish Fisheries off Alaska, 2007*. National Marine Fisheries Service, Alaska Fisheries Science Center. Forthcoming November 2008b)

Holmes, Elizabeth et al. Fecundity Declines in Steller Sea Lions Suggest New Conservation and Research Priorities. NMFS Alaska Regional Office. 2006.

International Pacific Halibut Commission (IPHC). History. Undated. Available at http://www.iphc.washington.edu/halcom/pubs/pamphlet/1IPHCHistoryPage.pdf.

International Pacific Halibut Commission (IPHC). *Commercial landings of Pacific halibut, 1929-1990.* 2008. Available at http://www.iphc.washington.edu/halcom/research/sa/legacy.data/landings.data/landings.html

Intrafish Media. "American Seafoods, Samherji Investing in Cod Farming Fund." *Intrafish*. November 2007.

Jones, Peter. NMFS. Personal communication with Northern Economics, January 17, 2008.

Knapp, Gunnar. An Overview of Alaska Pollock Markets. Paper presented at the 2006 Marine Science Symposium, January 23-25, 2006, Anchorage, AK. 2006a.

Knapp, Gunnar. *Selected Market Information for Pacific Cod*. Paper prepared for the North Pacific Fisheries Management Council. January 2006b.

Knapp, Gunnar. Economic Impacts of BSAI Crab Rationalization on Kodiak Fishing Employment and Earnings and Kodiak Businesses: A Preliminary Analysis. June 2006c.

Knapp, Gunnar and Marie Lowe. Economic and Social Impacts of BSAI Crab Rationalization on the Communities of King Cove, Akutan and False Pass. Prepared for the Aleutians East Borough and City of King Cove. November 2007

Knapp, Gunnar, Cathy Roheim and James Anderson. *The Great Salmon Run: Competition Between Wild and Farmed Salmon*. TRAFFIC North America, World Wildlife Fund. January 2007.

Kruse, Gordon et al. *Overview of State-Managed Marine Fisheries in the Central and Western Gulf of Alaska, Aleutian Islands, and Southeastern Bering Sea, with Reference to Steller Sea Lions*. Alaska Department Fish and Game Regional Information Report 5J00-10. October 2000.

Leman, Bruce. IPHC. Personal communication with Northern Economics, January 25, 2008.

Marine Stewardship Council (MSC). About MSC. 2007a. Available at http://eng.msc.org/.

Marine Stewardship Council (MSC). *Annual Report 2006/07*. 2007b.

McDowell Group, Inc. *A Fresh Seafood Distribution Center: An Assessment of Need*. Prepared for World Trade Center Alaska. October 2001.

McDowell Group, Inc. *State of Alaska Seafood Economic Strategies. Draft Report*. Prepared for State of Alaska Office of the Governor. December 2006.

Miller, Chris. "Alaska's Labor Force." *Alaska Economic Trends*. March 2002.

Montaigne, Fen. "Still Waters, the Global Fish Crisis." *National Geographic Magazine Online*. Available at http://ngm.nationalgeographic.com/2007/04/global-fisheries-crisis/montaigne-text/1. April 2007.

Munson, Dee. "Good Brands, Great Partners." *Flavor & the Menu*. Summer 2004.

National Research Council. *The Community Development Quota Program in Alaska*. 1999.

National Marine Fisheries Service (NMFS). *Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement. Appendix D: Market Analysis*. November 2001.

National Marine Fisheries Service (NMFS). *Final Environmental Impact Statement for American Fisheries Act Amendments 61/61/13/8*. February 2002.

National Marine Fisheries Service (NMFS). *Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impact Statement*. June 2004.

National Marine Fisheries Service (NMFS). *Steller Sea Lion and Northern Fur Seal Research Final Programmatic Environmental Impact Statement. Volume 1*. May 2007a.

National Marine Fisheries Service (NMFS). *Fisheries of the United States 2006*. July 2007b.

National Marine Fisheries Service (NMFS). *Pacific Halibut–Sablefish IFQ Report For Fishing Year 2005*. August 2007c.

National Marine Fisheries Service (NMFS). *Annual Commercial Landing Statistics*. July 2008a. Available at http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html

National Marine Fisheries Service (NMFS). *Cumulative Trade Data by U.S. Customs District*. NMFS, Office of Science and Technology. October, 2008b. Available at http://www.st.nmfs.noaa.gov/st1/trade/cumulative_data/TradeDataDistrict.html.

National Marine Fisheries Service (NMFS). *Total Commercial Fishery Landings At Major U. S. Ports Summarized By Year And Ranked By Dollar Value*. NMFS Office of Science and Technology. November 2008c. Available at http://www.st.nmfs.noaa.gov/pls/webpls/MF_LPORT_YEARD.RESULTS.

National Marine Fisheries Service (NMFS). Annual Commercial Landing Statistics. 2008d. Available at http://www.st.nmfs.noaa.gov/pls/webpls/FT_HELP.SPECIES\

National Marine Fisheries Service (NMFS). IFQ Halibut/Sablefish Reports and CDQ Halibut Program Reports. 2008e. Availiable at http://www.fakr.noaa.gov/ram/ifqreports.htm#harvest

National Marine Fisheries Service (NMFS) and North Pacific Fishery Management Council (NPFMC). *Bering Sea Aleutian Islands Crab Fisheries Final Environmental Impact Statement*. August 2004.

Nelson, Nicole. "Alaska Airlines and Iceland Air Cargo Thrive on Seafood." *Seafood.com News*. January 31, 2008.

Ng, Joo Siang. 2007. Development of China as the World's Largest Re-processing Centre of Frozen Fish Products and Future Challenges for the Industry. FAO Trade Conference on Aquaculture, 29-31

May 2007, Qingdao, China. NJS-FAOSpeech-27May07. Available at http://www.globefish.org/filedownload.php?fileId=502.

Northern Economics. Inc. *Alaska Groundfish Market Profiles*. Prepared for National Marine Fisheries Service Alaska Fisheries Science Center. September 2007.

Northern Economics, Inc. *An Assessment of the Socioeconomic Impacts of the Western Alaska Community Development Quota Program*. Prepared for Alaska Department of Community and Economic Development. November 2002.

Northern Economics, Inc. *Improving Seafood Labor Harvesting Data Collection in Alaska Fisheries*. Prepared for Southwest Alaska Municipal Conference. March 2007.

North Pacific Fishery Management Council (NPFMC). *Discussion Paper on Cooperative Vessel Use Caps Bering Sea /Aleutian Islands Crab*. February 2007.

North Pacific Fishery Management Council (NPFMC). *Analysis of Terms of an Entry Level Loan Program Bering Sea and Aleutian Islands Crab Fisheries*. February 2008.

Oliver, Chris. NPFMC. Personal communication with Northern Economics, January 25, 2008.

Olson, Paul and Dan Robinson. "Employment in the Alaska Fisheries." Alaska Economic Trends. December 2004.

Palin, Sarah. "Alaska's Fishing Industry: A Jewel in Our Crown." *Alaska Economic Trends*. November 2007.

Paterni, Mark. NMFS. Personal communication with Northern Economics, January 25, 2008.

Patton, Michael and Dan Robinson. "Employment in the Alaska Fisheries." *Alaska Economic Trends*. February 2006.

Penrose, Shirley. Commercial Fishing Entry Commission (CFEC). Personal communication with Northern Economics, January 23, 2008.

Pew Ocean Commission. *America's Living Oceans: Charting a Course for Sea Change*. June 2003.

Plan Team for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands. *Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions 2007*. September 2007.

Plotnik, Mike. ADF&G. *Compilations at the request of Northern Economics of historic herring landings data from selected ADF&G Management reports*. September 2008.

Popp, Bill. "Catching the Cool Chain." *Food & Drink Quarterly*. Vol. 4, No. 1. 2007.

Pollard Jonathan. NOAA Office of General Counsel. Personal communication with Northern Economics. January 2008.

Rae, Brian. "Meeting Alaska's Seasonal Employment Needs." *Alaska Economic Trends*. December 1997.

Ragone, Lisa. U.S. Coast Guard Personal communication with Northern Economics. January 2008.

Redmayne, Peter. "China Seafood: The Whole Inside Story." *Simply Seafood Newsletter*. Summer 2007.

Retherford, Brittany. "Agreement Could Send More Fresh Fish to Asia." Juneauempire.com. February 4, 2007.

Roberts, Santi and Melissa Stevens. *Seafood Watch Seafood Report: Pacific Flatfish*. Monterey Bay Aquarium. May 2006.

Robinson, Dan and Neal Gilbertsen. "Fish Harvesting Employment." *Alaska Economic Trends*. December 2006.

Sackton, John. "MSC Pledges Improvements As It Certifies Alaska Salmon Fishery in Process That Was Seriously Flawed." *Seafood.com News*. November 6, 2007.

Sackton, John. "Bloom is Off the Rose as Cod Farming Flounders, Even as Whitefish Prices Skyrocket." *Seafood.com News*. February 20, 2008.

Sánchez, Jorge, Franke, Tanya and Zecha, Amy. *China, Peoples Republic of, Fishery Products, U.S. Seafood Exports to China are Re-exported to Third Countries*. USDA Foreign Agricultural Service GAIN Report Number CH8002. January 2008.

Seafood Market Bulletin. "Alaska Pollock Fishery." November 2005.

Seafood Market Bulletin. "Marketplace Competition: Farmed Cod." June 2006.

Seafood Market Bulletin. "Alaska Seafood Exports: Changing Market Destinations." June 2007a.

Seafood Market Bulletin. "Competitive Analysis: Phenomenal Growth in Whitefish Aquaculture." February 2007b.

Seafood.com News. "NPFMC Advisory Committee Proposes BSAI Pollock TAC of 1 Millions Tons, 30% Reduction, for 2008." November 16, 2007.

Sepez, Jennifer et al. *Community Profiles for North Pacific fisheries – Alaska*. NOAA Technical Report NMFS-AFSC-160. December 2005.

Scholz, Astrid. *Socioeconomic Baseline Information for the Pribilof Islands*. NPRB Project 528 Final Report. May 2007.

Shields, Ed. *Salt of the Sea, The Pacific Coast Cod Fishery and the Last Days of Sail*. Pacific Heritage Press. 2001.

Sisk, John. "The Southeastern Alaska Salmon Industry: Historical Overview and Current Status." In John Schoen and Erin Dovichin (eds.), *The Coastal Forests and Mountains Ecoregion of Southeastern Alaska and the Tongass National Forest*. March 2007.

Southwest Alaska Municipal Conference (SWAMC). *Southwest Alaska Comprehensive Economic Development Strategy Annual Update 2007*. July 2007.

Tremaine, Richard. "Catching Seafood Dollars in Alaska." *Alaska Business Monthly*. October 1, 1989.

Turnock, Benjamin and Louis Rugolo. *Appendix A: Stock assessment of eastern Bering Sea snow crab. Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions 2007*. September 2007.

U.S. Census Bureau. Consolidated Federal Funds Report: Fiscal Year 2006. 2007. Available at http://harvester.census.gov/cffr

U.S. Coast Guard. 17th Coast Guard District 2006 Year in Review Report to the North Pacific Fishery Management Council. 2007.

Welch, Laine. "Alaska Salmon Price and Permit Values Ticking Upwards." *SitNews*. November 5, 2007a.

Welch, Laine. *"Last Minute Push by SWAMC and Kodiak Crew Association Rescues Crew data Project in Alaska"*. Fish Radio with Laine Welch. April 15, 2008.

Welch, Laine. "Sales Value for Salmon, Halibut Hits High Side." *The Anchorage Daily News*. November 17, 2007b.

Welch, Laine. "Trident's Alaska Pollock Roe Merits Eco-label." *Alaska Journal of Commerce*. December 2, 2007c.

West, Heather, Kasper Viio and Maggie Ma. "Global Seafood Deals Driven by Retail Consolidation, Efforts to Diversify." *Mergermarket.com*. November 22, 2007.

Wink, Andrew, Jeff Hadland and Brian Laurent. "Alaska's Fishermen." *Alaska Trends*. November 2007.

Woodby, Doug et al. *Commercial Fisheries in Alaska*. Alaska Department of Fish and Game, Special Publication 05-09. June 2005.