The Importance of the Bristol Bay Salmon Fisheries to the Region and its Residents

Prepared for the

Bristol Bay Economic Development Corporation

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Prepared by

Northern Economics

Northern Economics
880 H Street, Suite 210
Anchorage, Alaska 99501
Phone: (907) 274-5600
Fax: (907) 274-5601

114 W Magnolia Street, Suite 411
Bellingham, WA 98225
Phone: (360) 715-1808
Fax: (360) 715-3588
Email: mail@norecon.com

Executive Summary

This executive summary is organized by subject matter as follows:

- Key Findings
- Population and School Enrollment
- Cost of Living in Bristol Bay
- Capitalization of Drift Gillnet Vessels
- The Drift Gillnet Fishery
- The Set Gillnet Fishery
- Other Fishery Revenue and Employment
- Estimated Operating Costs in the Set and Drift Gillnet Fisheries
- Multiplier Effects of the Bristol Bay Salmon Fisheries
- Per Capita Revenue

Key Findings

Population in the Bristol Bay Region has, in general, remained relatively flat since 1984. Population in the Dillingham Census Area has increased slightly, while populations in the Bristol Bay Borough and Lake and Peninsula Borough have declined slightly. Forecasts of population for the region indicate that little overall change is expected. There has been some migration from smaller communities to larger communities, but this pattern has been less prevalent in Bristol Bay than in other Alaska regions.

School enrollments have generally followed population trends.

The cost of living in Bristol Bay is significantly higher than in Anchorage. Food costs in Dillingham are currently twice that of Anchorage, and are even higher in King Salmon, while fuel prices in the region approach or exceed 2 times Anchorage prices.

Drift gillnet vessels owned by local residents are on average older, have lower horsepower, are smaller in terms of gross tons, have less fuel capacity, and on average have less capacity for chilling fish, than vessels owned by permit holders living outside the Watershed.

Local permit holders in the drift gillnet fishery continue to decline and currently number fewer than 400. Gross revenue of local permit holders is about 15 percent of total gross revenue, and revenues per permit are now less than 70 percent of the fishery wide average.

Local permit holders in the set gillnet fishery have stabilized at about 375 after a long period of decline. Local permit holders generate about one-third of the fishery wide gross revenue, and generally earn an amount equal to the fishery-wide average.

Other income for local Bristol Bay permit holders is quite limited relative to other income for residents outside the watershed. In 2006, a total of 97 drift gillnet permit holders from the region were found to have other employment, while 94 local gillnet set permit holders had other jobs.

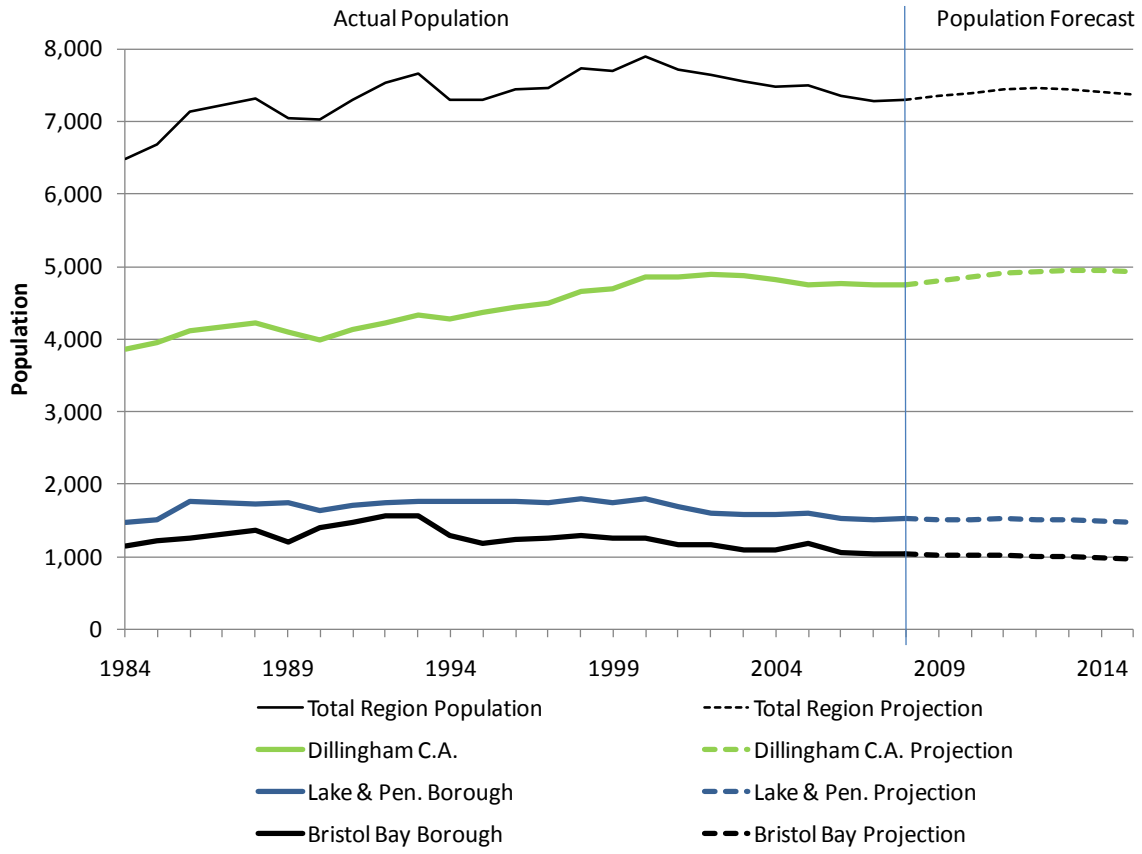
The multiplier effects of the Bristol Bay salmon fishery are significant. We estimate that salmon harvesting generates an additional $5 million in economic activity and 200 additonal jobs.

Per capita revenue from the Bristol Bay drift and set gillnet fisheries of permit holders residing in the Watershed after adjusting for inflation has fallen an average of $516 per year since 1984. In the 1980's per capita revenue was over $10,000, but since 2003 has fallen to an average of just $2,700.

Population and School Enrollment

The total population in the Bristol Bay rose from 1984 through the turn of the century before slipping into a decade-long decline in population. The current population of the region is roughly the same as it was fifteen years ago. Each of the three Borough/Census Areas included in this analysis—the Dillingham Census Area (DCA), the Lake and Peninsula Borough (LPB), and the Bristol Bay Borough (BBB)—is experiencing unique trends within the overall changes experienced by the region as a whole. Compared to the LPB and the BBB, the DCA has held on to much of the population increase that the area saw between 1984 and the early 2000s. Population in the DCA has been roughly flat over the last five years while both the BBB and the LPB are exhibiting long-term declines in population that began roughly ten years ago.

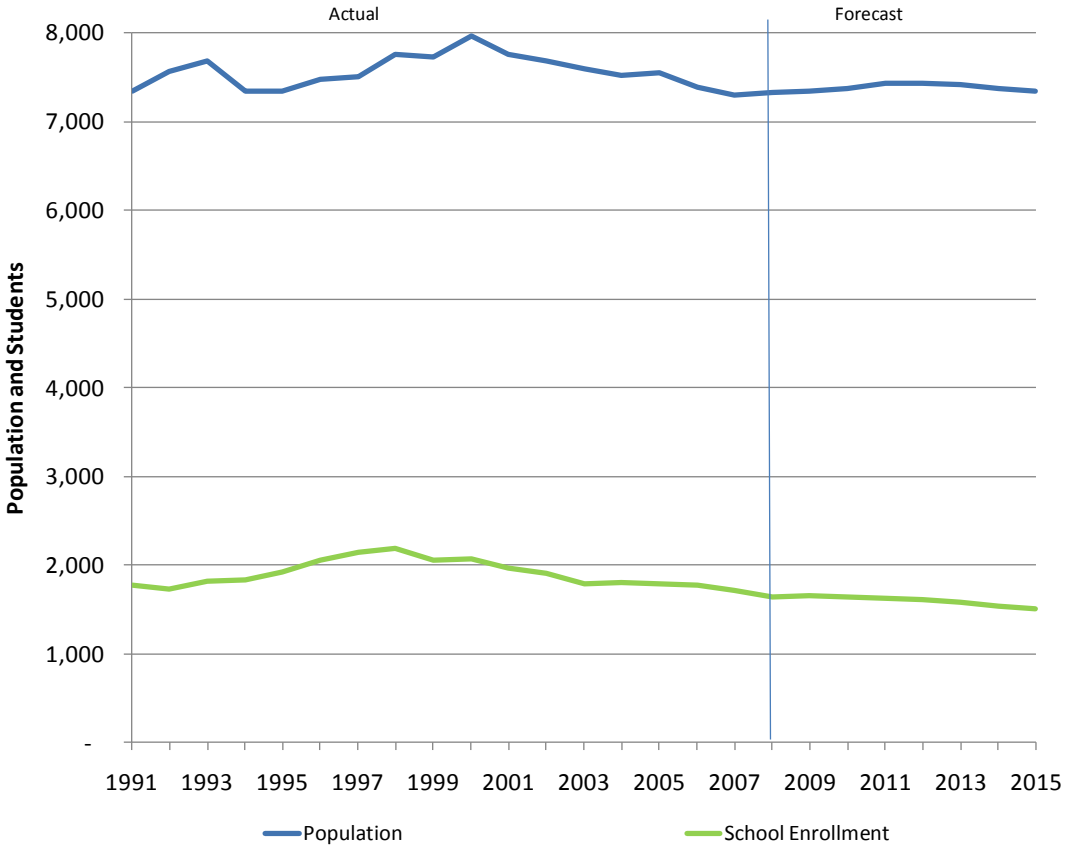
Figure ES-1. Population of the Bristol Bay Region 1984 – 2008 and Projections to 2014



Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008) and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

Overall changes in school enrollments have generally followed population trends with the exception that changes in overall school enrollment have been greater than changes in overall populations. For example, total school enrollment is down 20 percent from its peak while population is down roughly 10 percent from the peak. These data and trends indicate that the region is more likely to be losing young families with children that it is losing single-member households or older resident households.

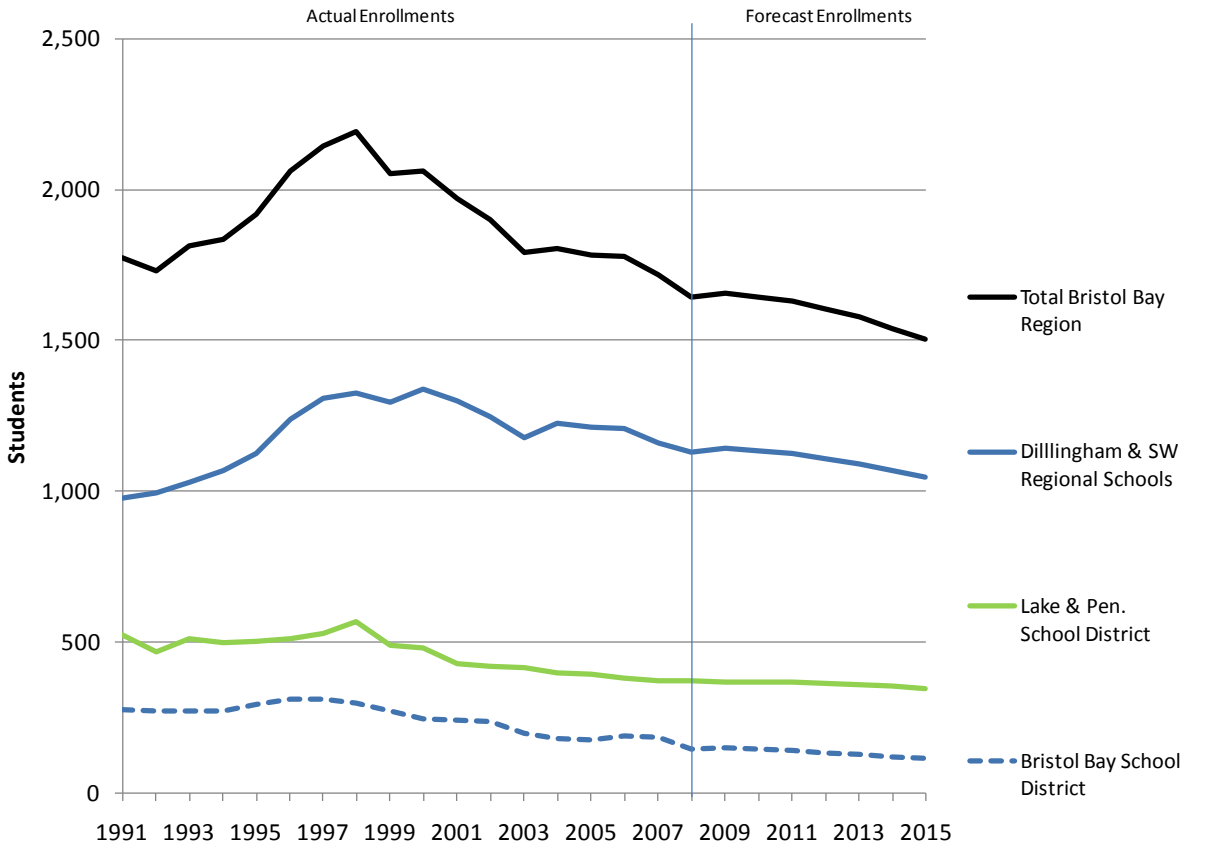
Figure ES-2. Actual and Forecast Population & School Enrollments in the Bristol Bay Region, 1991 - 2015



Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008), AK Dept. of Educatioin and Early Development (ADEED, 1991 - 2008), and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

The enrollment trends in the individual school districts within the region follow the patterns established by the individual population trends for the DCA, BBB, and LPB. While overall enrollment is down, the Dillingham and SW Regional School system has been relatively stable in comparison to the Lake and Peninsula School District and the Bristol Bay School District. Schools in the DCA, while down from their peak, have been relatively stable over the past five years, while the other two districts continue to exhibit a long-term decline in enrollment that began a more than a decade ago. The study notes that declines in school enrollment tend to precede declines in population by a year or two.

Figure ES-3. School Enrollments & Forecasts for the Bristol Bay Region by Borough & Census Area, 1991 – 2015



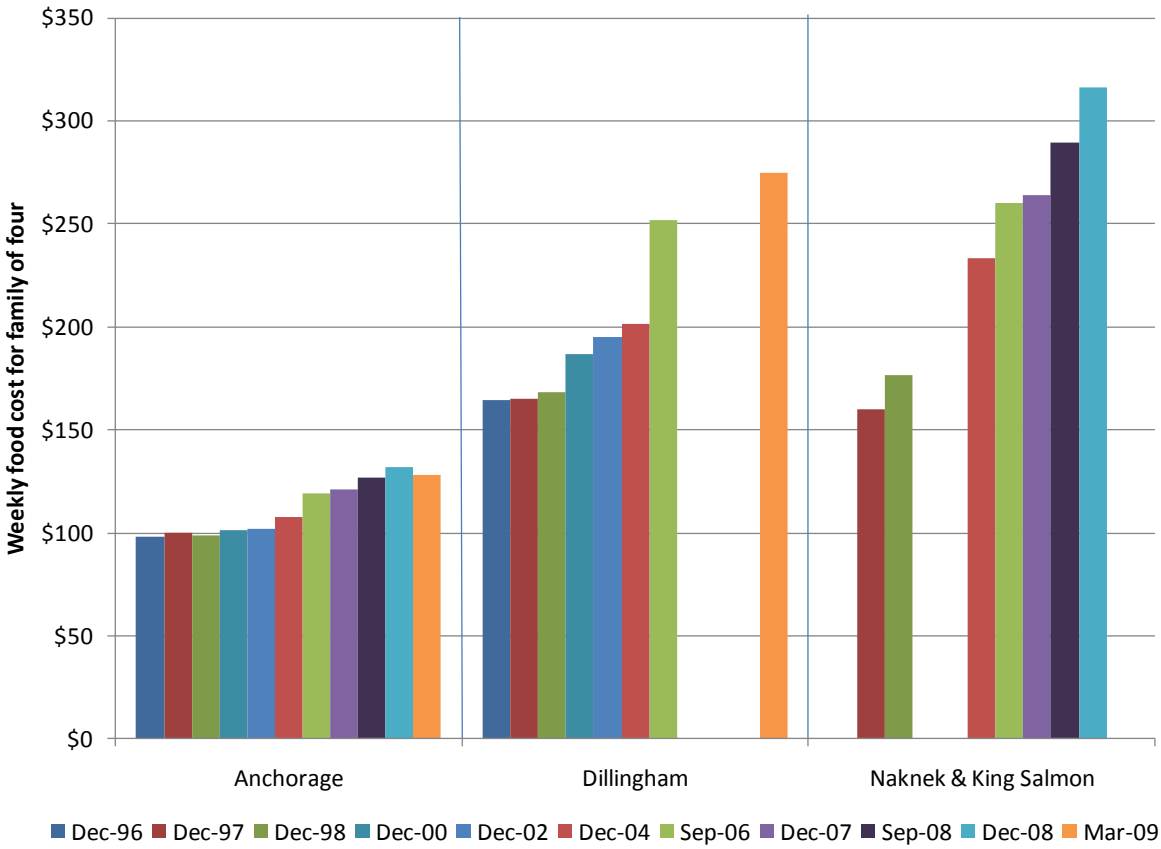
Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008), AK Dept. of Educatioin and Early Development (ADEED, 1991 - 2008), and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

Cost of Living in Bristol Bay

The study used data from the University of Alaska-Fairbank's Alaska Food Cost Survey to compare the long-term cost of food between Anchorage, Dillingham, and Naknek/King Salmon. While the study does not have continuous time-series for the Bristol Bay communities, the data make it clear that food costs have risen more quickly in Dillingham and Naknek/King Salmon than in Anchorage. A study conducted by 2008 by BBEDC (BBEDC, 2008) indicates that the costs of living in the coastal communities of the Bay outside of Dillingham are roughly seven percent higher than Dillingham, and it is reported that costs are even higher in inland communities such as New Stuyahok and Nondalton. Another recent study from the McDowell Group for the Alaska Department of Administration (McDowell Group, 2009) shows that the cost of living differential between Anchorage and Dillingham has increased since 1985.

Food costs in Dillingham are currently twice that of Anchorage, and are even higher in King Salmon. This additional increase is likely related to the increasing cost of shipping food to the region caused by rising fuel prices. At the same time, the data also make it clear that food costs are rising faster in Naknek/King Salmon than they are in Dillingham. In 1996, the cost of food in Dillingham and Naknek/King Salmon was roughly equal. Since that time the cost of food in Dillingham has risen nearly 70 percent while the cost in Naknek/King Salmon has increased by nearly 100 percent.

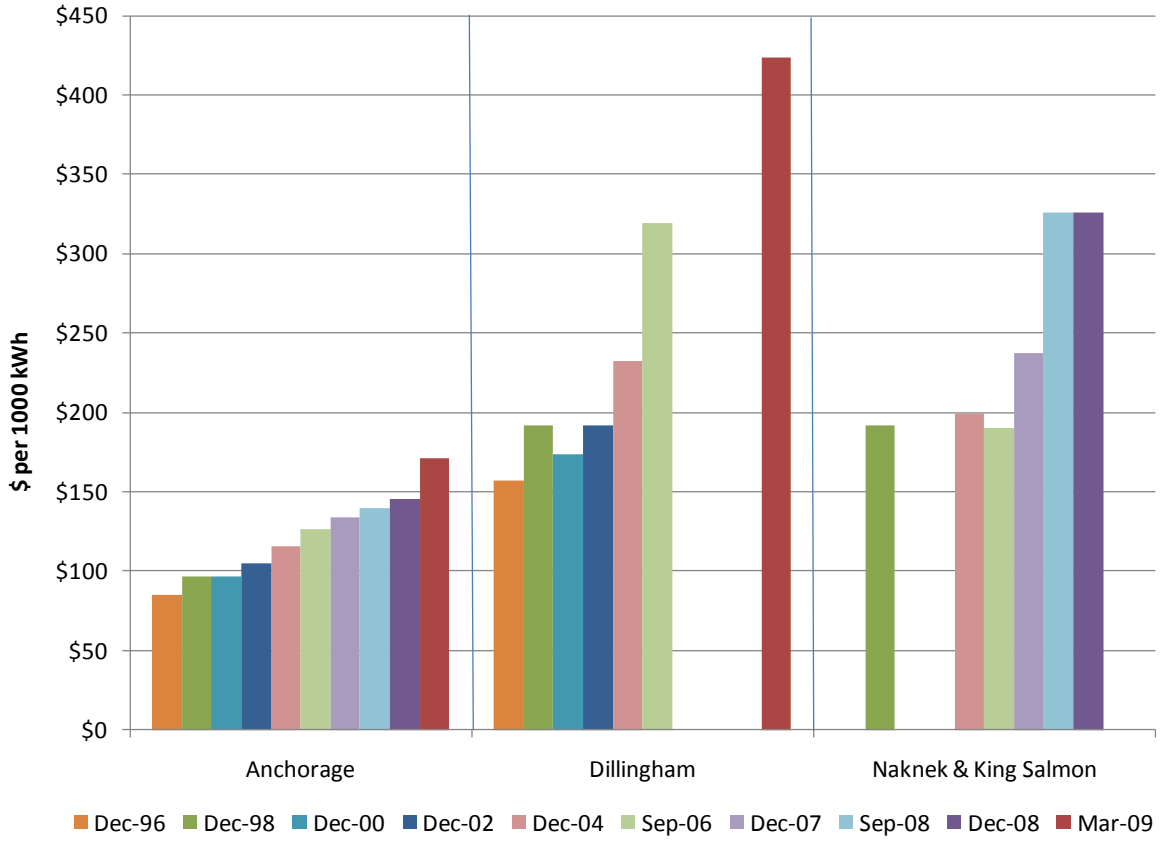
Figure ES-4. Comparison of Family Food Costs in Anchorage Dillingham and Naknek/King Salmon, 1996 - 2009



Source: Figure developed by Northern Economics based on data from UAF Cooperative Extension Service Alaska Food Cost Survey (UAF Cooperative Extension Service, 1996 - 2009).

As with food, the cost of electricity increased much more rapidly in Dillingham and Naknek/King Salmon than it has in Anchorage. Anchorage's utilities are powered by comparatively local natural gas supplies and hydroelectric facilities. Electricity costs in Dillingham are nearly 3 times the cost in Anchorage, while costs of electricity in King Salmon approach 2 times Anchorage costs. The primary reasons for the increasing cost of electricity in the region are the increasing cost of diesel and fuel oil and the increasing cost of shipping diesel and fuel oil. Unfortunately, a change in the commodity price for fuel hits the region twice; once through the price of the commodity itself and once through energy intensive process of transportation.

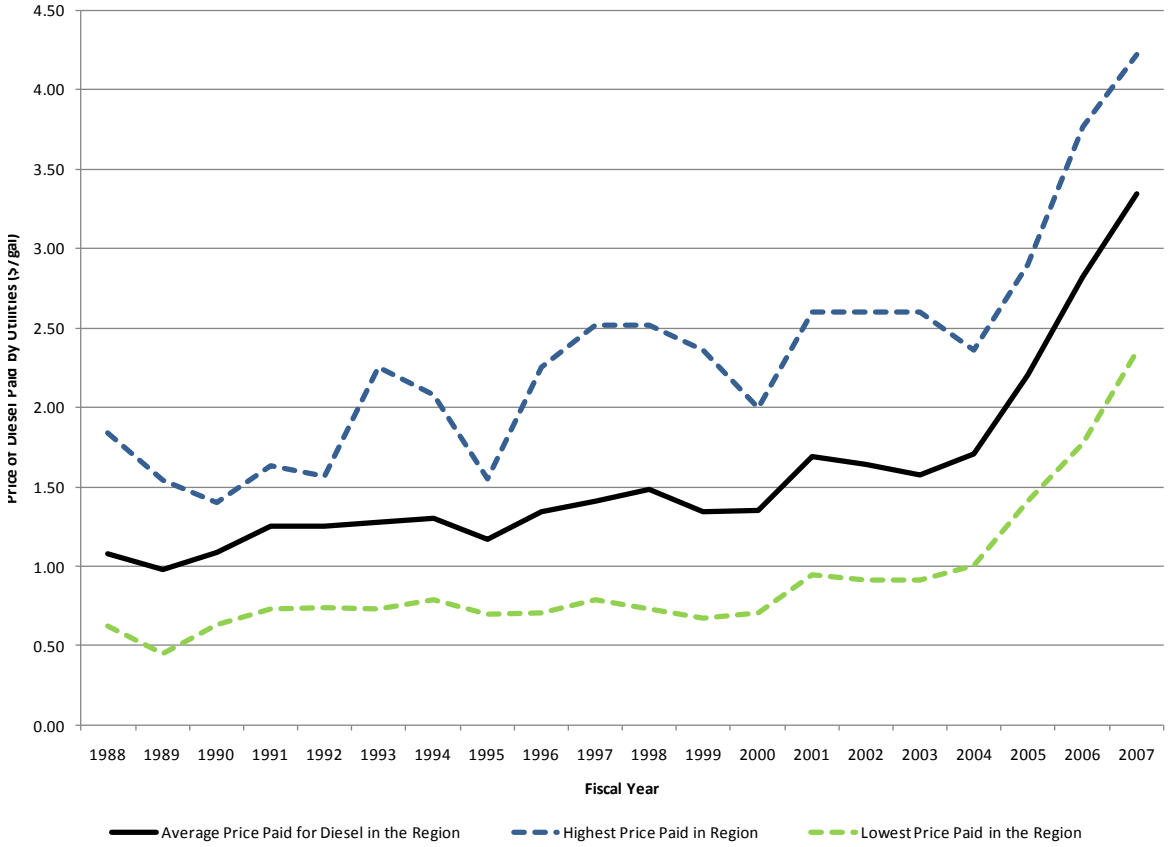
Figure ES-5. Comparison of Electricity Costs in Anchorage Dillingham and Naknek/King Salmon, 1996 - 2009



Source: Figure developed by Northern Economics based on data from UAF Cooperative Extension Service Alaska Food Cost Survey (UAF Cooperative Extension Service, 1996 - 2009).

The price paid for diesel by the region's highest cost utilities is up to three times the price paid by the regions lowest cost utilities. In addition, the highest cost utilities experience greater swings in their overall fuel costs. This effect is likely a result of the magnifying effect of having to transport small amounts of fuel to a remote region. As noted above, in these cases the change in price is magnified as the retail price needs to reflect the change in the price of the commodity as well as the change in the price of transporting the fuel.

Figure ES-6. Highest and Lowest Prices Paid by Utilities for Diesel 1988 - 2007



Source: Figure developed by Northern Economics based on data from Statistical Reports of the Power Cost Equalization Progam (AEA, 1988 - 2009).

Comparisons of Vessel Characteristics

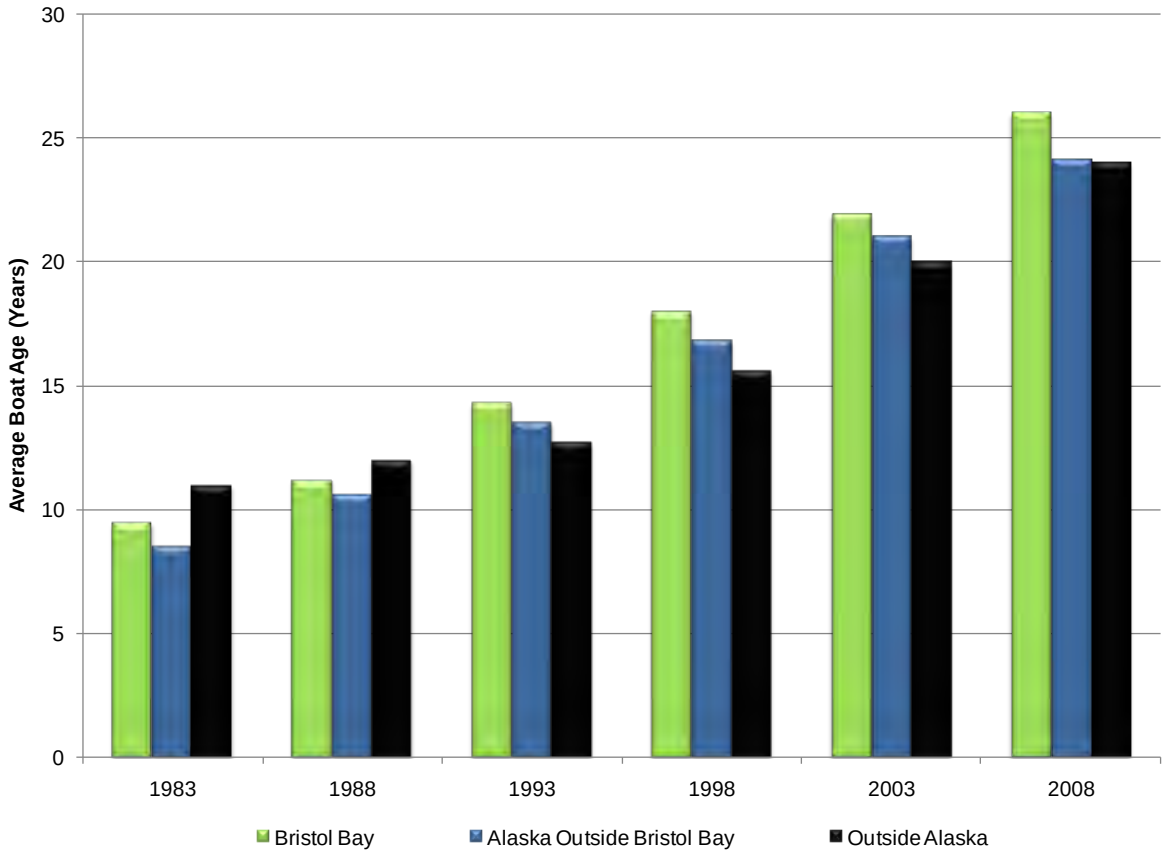
In this section we compare the characteristics of drift gillnet vessel across regions of residence:

1) Permit holders from **Bristol Bay**
2) **Other Alaska** permit holders
3) Permits holders from **Outside Alaska**

In general, vessels owned by Watershed permit holders are older, have lower horsepower, are smaller in terms of gross tons, have less fuel capacity and on average have less capacity for chilling fish.

In 1983 the average Bristol Bay resident vessel was 1.5 years (16.1 percent) younger than the average vessel from outside of Alaska. By 1998, the average Bristol Bay resident vessel was 2.4 years (13 percent) older as a greater proportion of non-Bristol Bay residents acquired newer boats. Since 2003, that average age difference has stayed approximately 2 years apart.

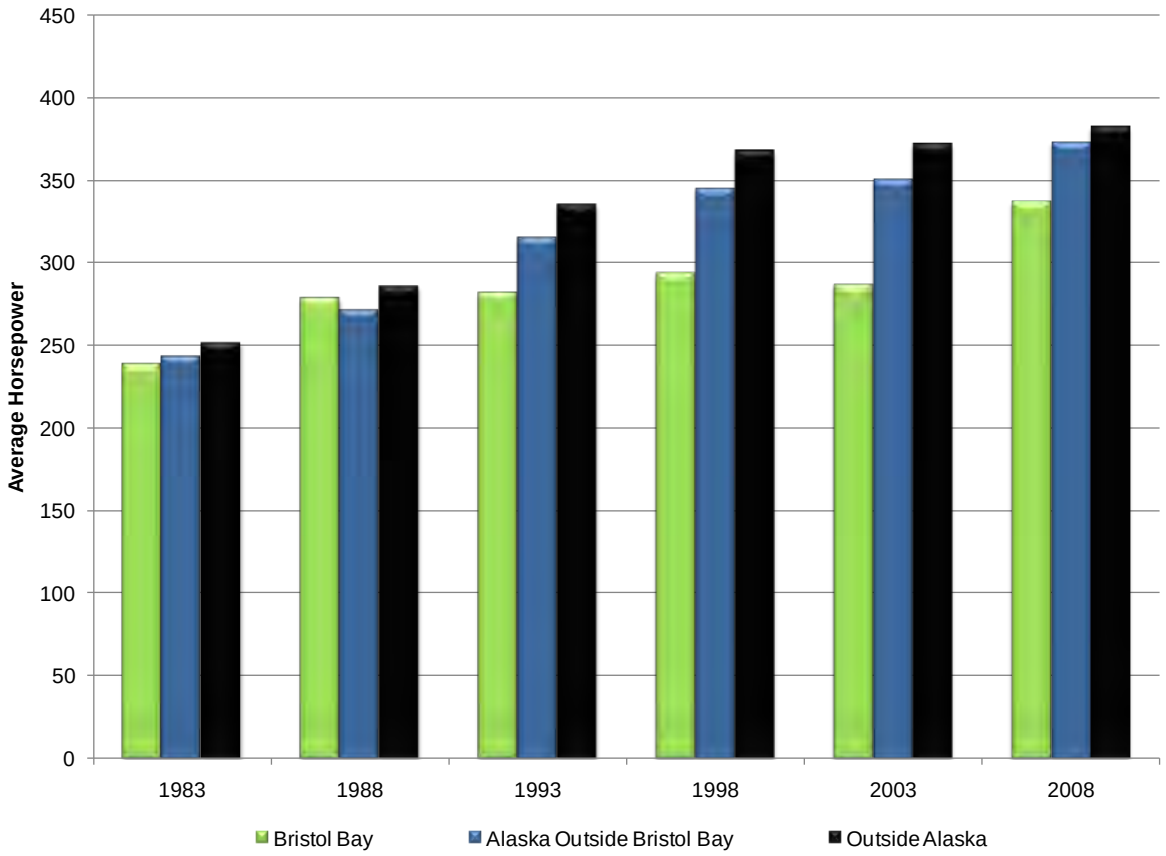
Figure ES-7. Average Age of Vessel by Residence, 1983 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1983 - 2008).

Non-Bristol Bay resident vessels added horsepower in the late 1980s and early 1990s. In 1983, Bristol Bay resident vessels were slightly underpowered (roughly 13 HP or 5 percent) compared to their non-resident counterparts, but by 2003 this number had grown to an average of just over 85 HP or 22.9 percent. In 2008, the average difference had shrunk to 11.8 percent as non-resident boat horsepower stabilized between 370 to 380 HP and resident vessels increased their average HP to over 330 HP.

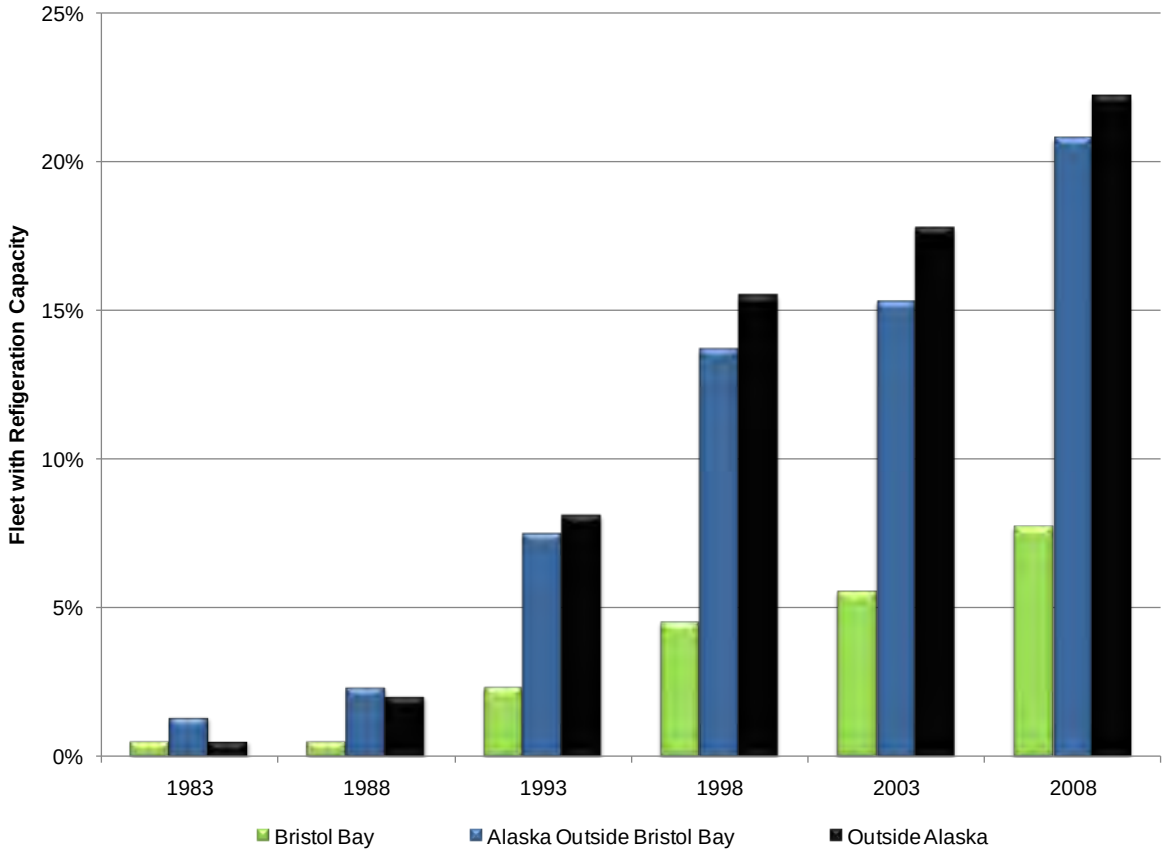
Figure ES-8. Average Horsepower of Vessels by Residence, 1983 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1983 - 2008).

The area in which Bristol Bay resident vessels lost the most ground is refrigeration capacity. In 1983, the same percentage of resident vessels and vessels from outside of Alaska were equipped with refrigeration capacity—0.5 percent. Non-resident vessels have added refrigeration capacity steadily, and by 2008 22 percent of the vessels from outside of Alaska had some form of refrigeration capabilities. Less than eight percent of Bristol Bay resident vessels could say the same in 2008. In an era in which the quality of delivered fish is becoming more and more important, the differences in refrigeration capacity may lead to further differences in ex-vessel prices received by residents of the watershed.

Figure ES-9. Percent of Vessels with Refrigeration Capacity, 1983 - 2008



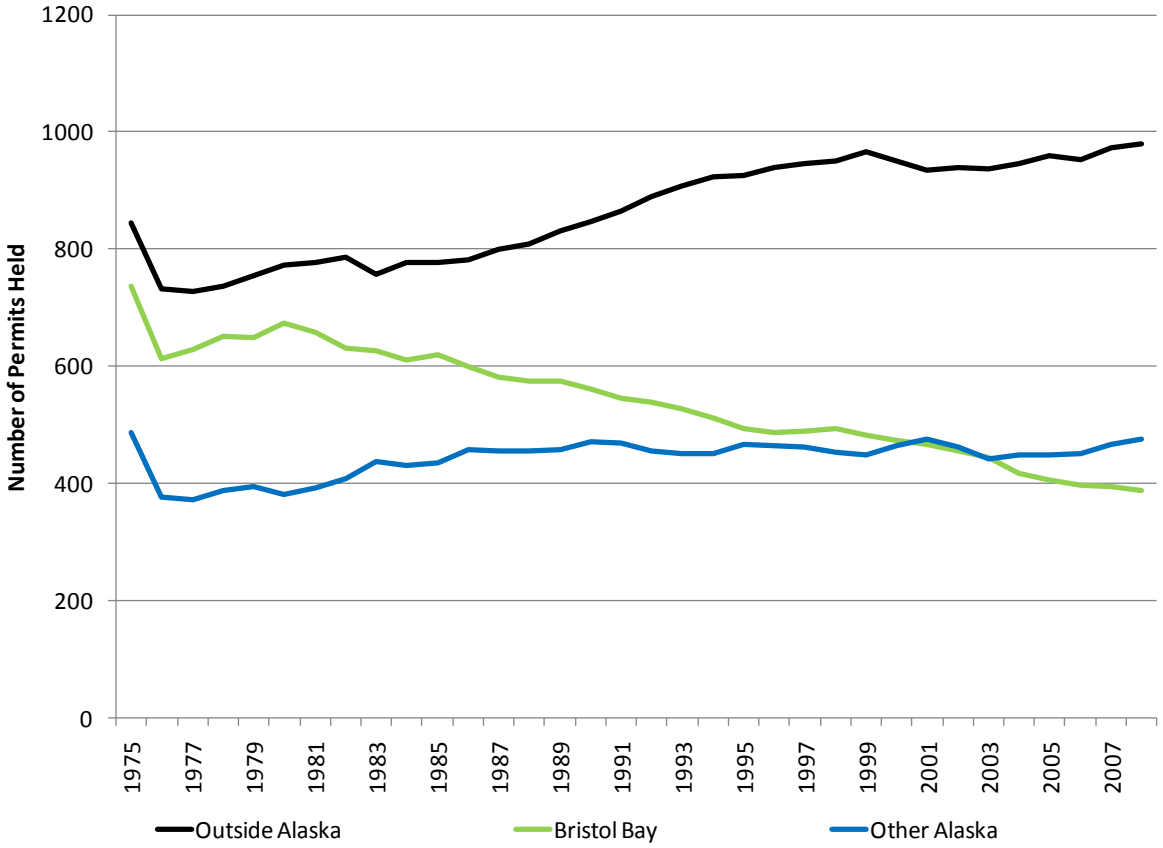
Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1983 - 2008).

The Drift Gillnet Fishery

In this section, we examine the drift gillnet fishery. Our discussion is centered on the same three regions of residence: (Bristol Bay, Other Alaska, and Outside Alaska).

The out-migration of drift gillnet permits is a long-term issue for the region. The study analyzed Commercial Fisheries Entry Commission (CFEC) data to determine the residency of drift gill net permit holders. The data reveal that the out-migration of permits from the Bristol Bay region has not slowed in recent years and has continued at a relatively constant rate over the past 30 years. The majority of these permits are eventually held by individuals who live outside of Alaska; the number of "other Alaska" permits has stayed relatively constant over the last decade. It is not clear whether these data represent an out-migration of individuals, an out-migration of permits, or both.

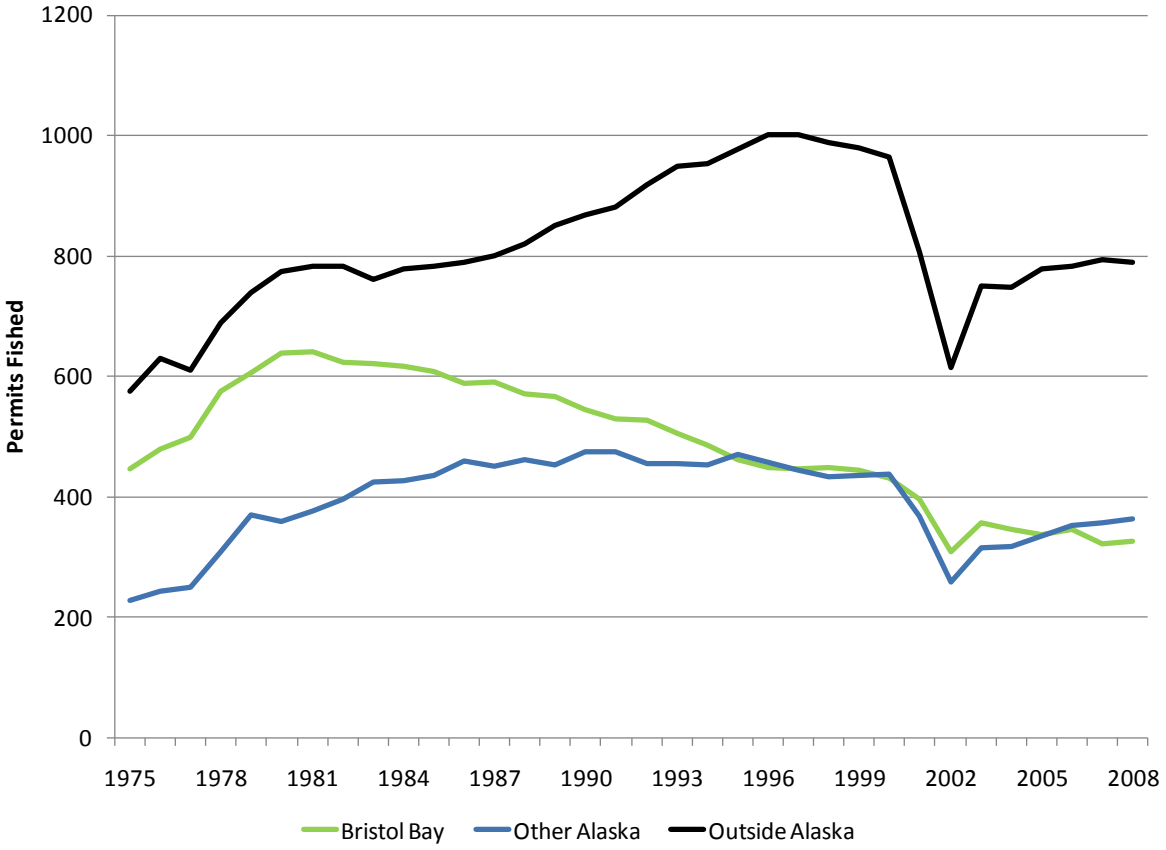
Figure ES-10. Number of Drift Gillnet Permits Held By Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The regional patterns of the actual fishing of drift gillnet permits is roughly equivalent to ownership patterns with the exception that in times of low prices, the participation rate tends to fall more amongst permit holders who live in the Other Alaska and Outside Alaska regions. This participation rate differential represents the higher cost for permits holders from outside the region to travel to the region. In addition, the differential likely represents the higher opportunity cost of fishing as "Outside" permit holders are likely to have other options to earn money.

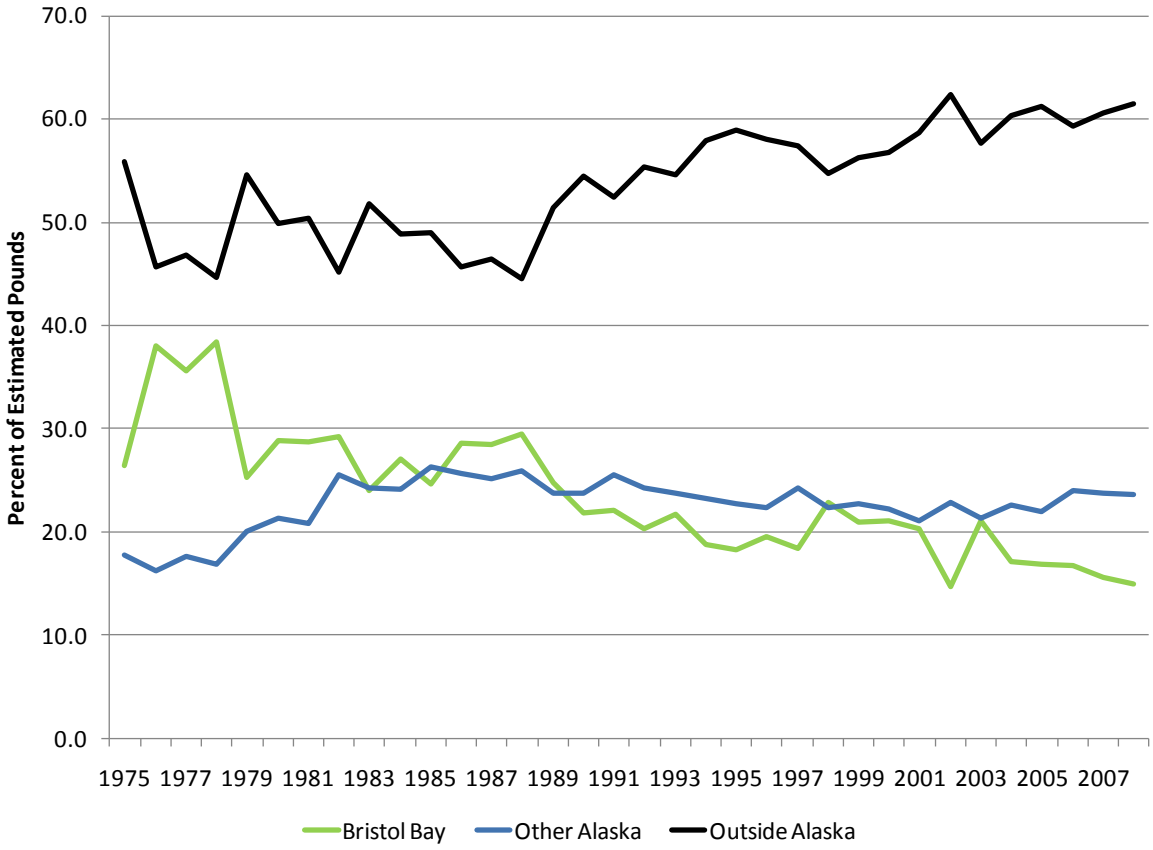
Figure ES-11. Number of Drift Gillnet Permits Fished By Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

Not surprisingly, the portion of pounds harvested by region generally follows the portion of permits held by a given region with adjustments for participation rate and overall fishing efficiency. While "Outside" permit holders are less likely to participate in lower price years, they are most successful on average harvesting a higher number of pounds per permit.

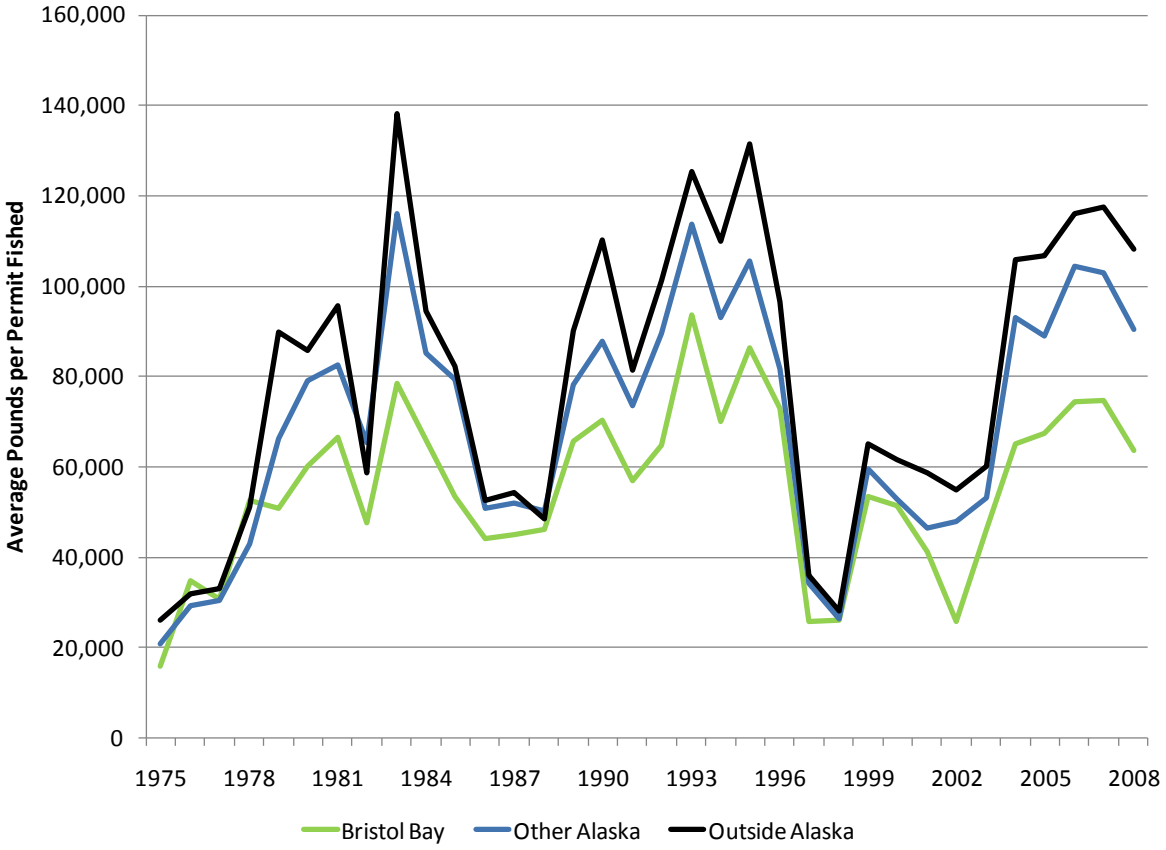
Figure ES-12. Percent of Total Pounds Harvested in the Drift Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

As noted above, drift gillnet permit holders from the Bristol Bay Region traditionally harvest fewer pounds per permit than permit holders in other regions. In years of low abundance, this differential nearly disappears, but in years of higher abundance (i.e., higher average catches overall) the average permit holder from Outside Alaska can harvest up to 55 percent more fish than the average permit holder from the Bristol Bay region. This differential has increased in recent years; possibly because outside permit holders are investing more in their vessels.

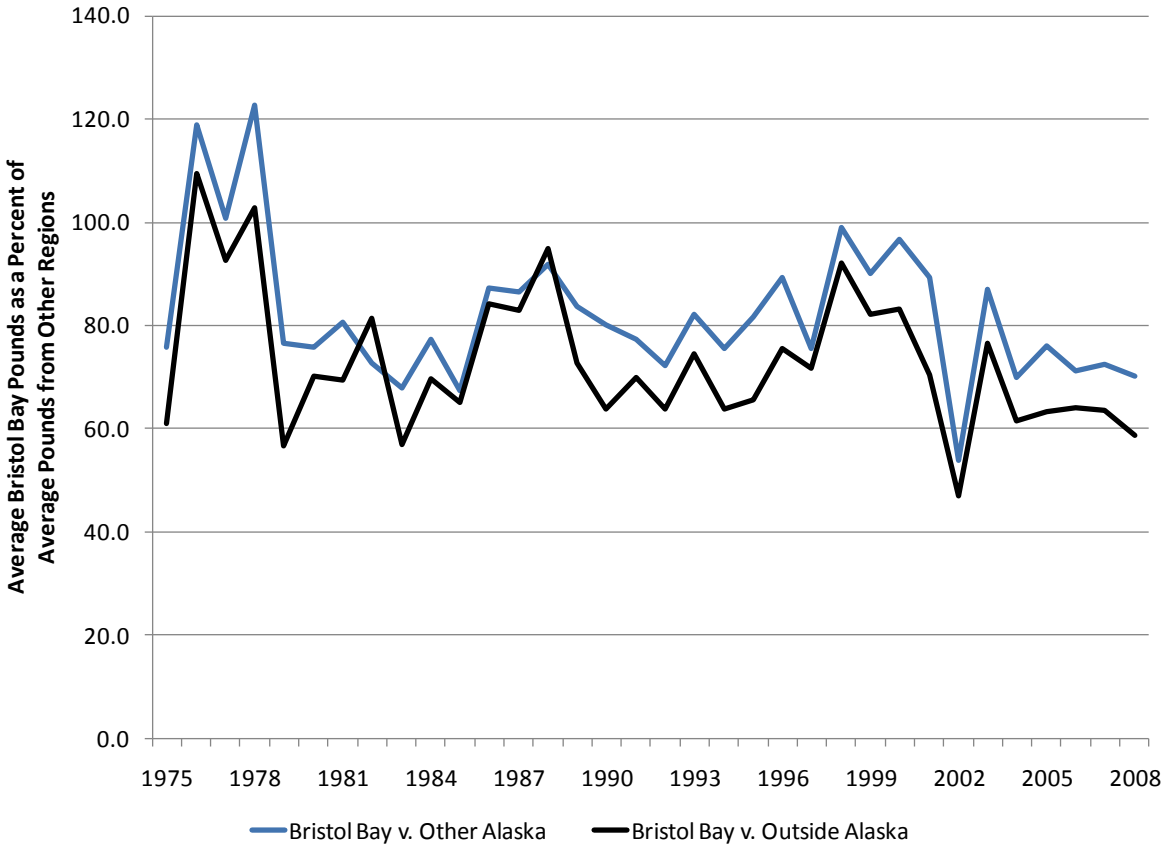
Figure ES-13. Average Pounds per Permit Fished in the Drift Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The figure below shows the average Bristol Bay drift gillnet permit holder harvest as a percentage of the harvest of both the average "Other Alaska" and "Outside Alaska" drift gillnet permit holder. The data show how the differential shrinks in years of lower abundance (e.g., 1998) and how the average Bristol Bay catch as a portion of other catches has shrunk in recent years. In recent years, the permit holders in the watershed have harvested only 60 to 70 percent of the average permit holder residing outside Alaska.

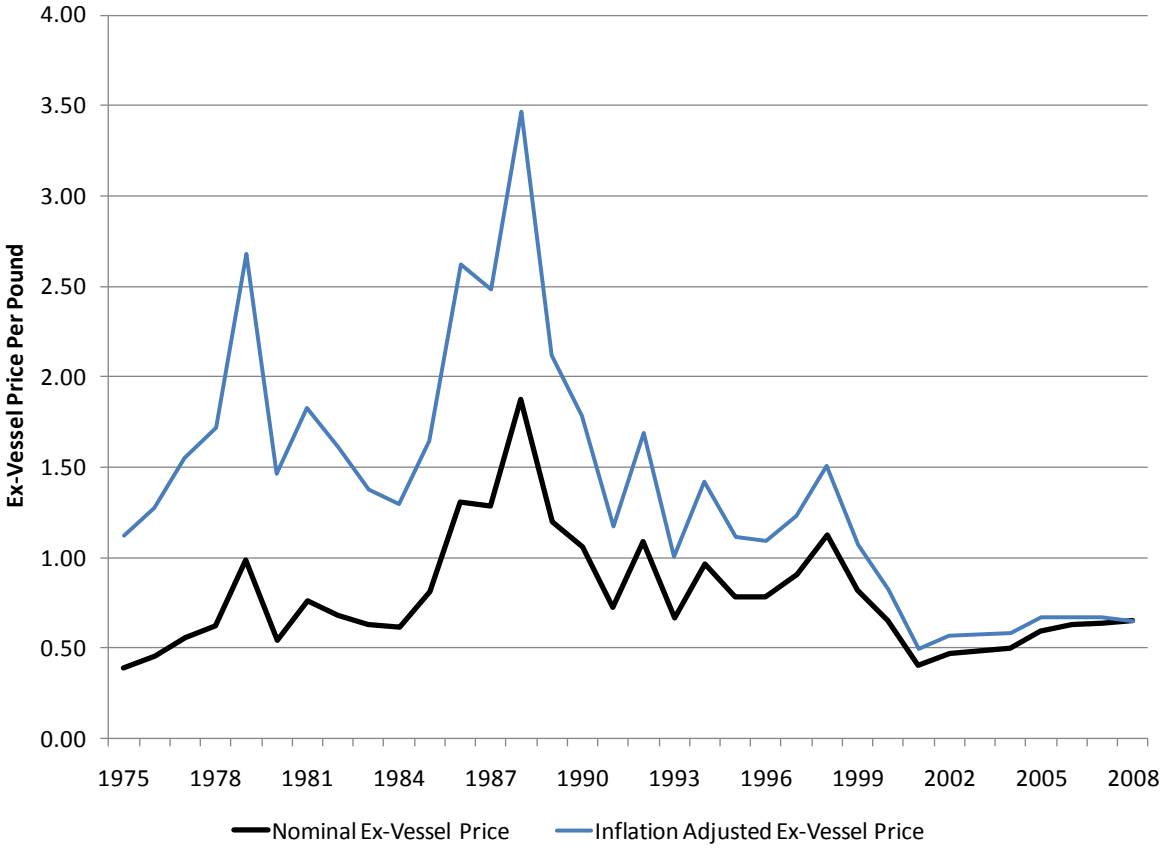
Figure ES-14. Average Lbs per Permit by Watershed Residents as a Percent of Average Lbs per Permit of Other Regions, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

This figure shows estimated ex-vessel revenue per pound of salmon landed in the Bristol Bay fishery. This is generally equivalent to the ex-vessel price of sockeye, but to the extent that other species are landed as part of the Bristol Bay fishery, they diverge from actual ex-vessel prices paid for sockeye. Both nominal and real prices are shown. (Real prices are adjusted for inflation based on 2008 dollars. Ex-vessel prices were at unprecedented levels from 1986 to 1988, then fell precipitously from 1989 to 1991. The price declines in the late 80s and early 90s corresponded to increasing volumes of farmed fish in the global market coupled with high volumes of harvests in capture fisheries. Prices fell again beginning in 1999 to record lows in 2001. Since then, prices have been relatively stable, increasing slightly through 2008.

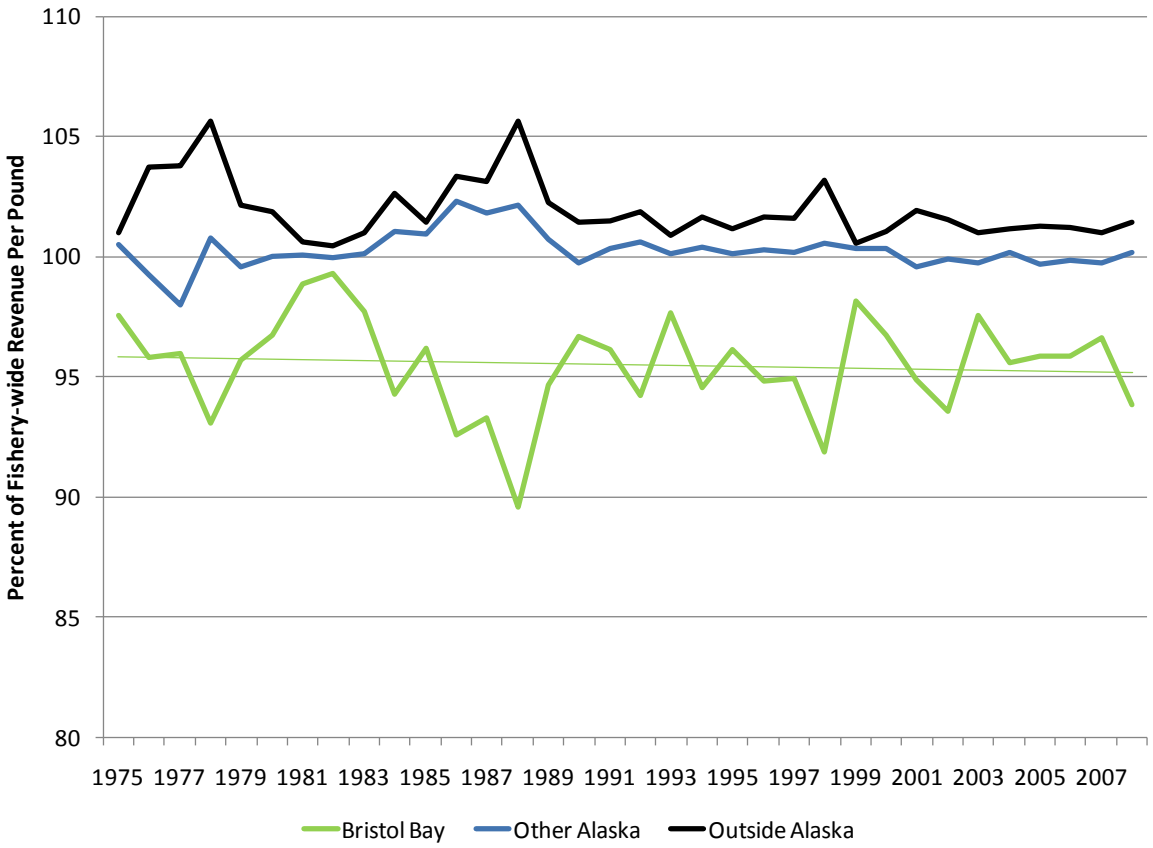
Figure ES-15. Imputed Nominal and Real (Adjusted for Inflation) Revenue per Pound Landed, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

This figure shows the average revenue per pound of salmon landed in the Bristol Bay drift gillnet fishery as a percent of the overall average revenue per pound. In general, residents of the watershed receive about 96 percent of the average revenue per pound. According to analysts at CFEC[1] (Iverson, 2009), the price differences shown here are due entirely to the fact that Bristol Bay residents are much more likely to fish the shoulder seasons, particularly later in the year, and thus are much more likely to deliver pinks, chums, and silvers as well as reds. Because permit holders from outside Alaska are much less likely to fish the shoulder seasons, a greater percentage of their landing are be sockeye and therefore the average revenue they receive per pound of salmon harvested is higher.

Figure ES-16. Revenue per Pound by Region as a Percent of Overall Revenue per Pound, 1975 – 2008

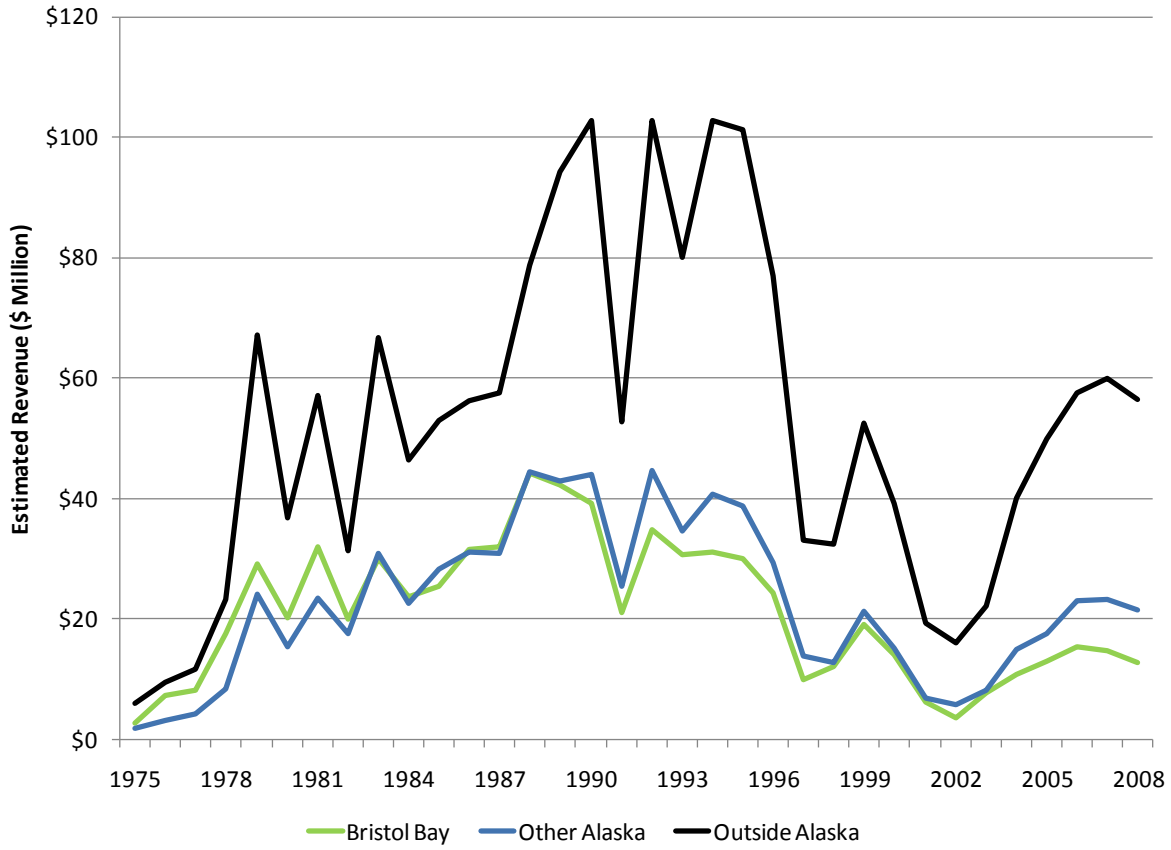


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

[1] According to Kurt Iverson of the CFEC (Iverson, 2009), CFEC uses a single price for all deliveries of of each species of salmon (Sockeye, King, etc) over the entire fishery area (Area T) by gear (drift gillnet or set gillnet) and delivery code (whole, whole/bled, H&G, etc). Because of this, data from CFEC does not pick up any price difference that might be paid by different processors or for different levels of quality (e.g. chilled or unchilled). CFEC prices do include bonuses paid for production, roe or for chilled fish, but these amounts are averaged out over the entire fishery.

Permit holders from outside Alaska have generated the largest share of revenues since 1975. By 1983 Alaska residents from outside the watershed were generating more revenues than watershed residents, in spite of the fact that 621 watershed residents fished while only 424 permits were fished by other Alaska residents. Gross revenues were highest from 1987 to 1995 with the exception of a single bad year in 1991, when both harvested pounds and ex-vessel prices declined sharply. Revenues in the fishery bottomed out in 2002 and have been increasing since then. However, revenues of watershed residents have been increasing at a slower rate than revenues of other Alaska residents and residents for outside Alaska. The fact that revenues in the watershed are not increasing as fast as others in due primarily to that fact that permits held by watershed residents continue to decline, and participation levels of permit holders outside the watershed are increasing.

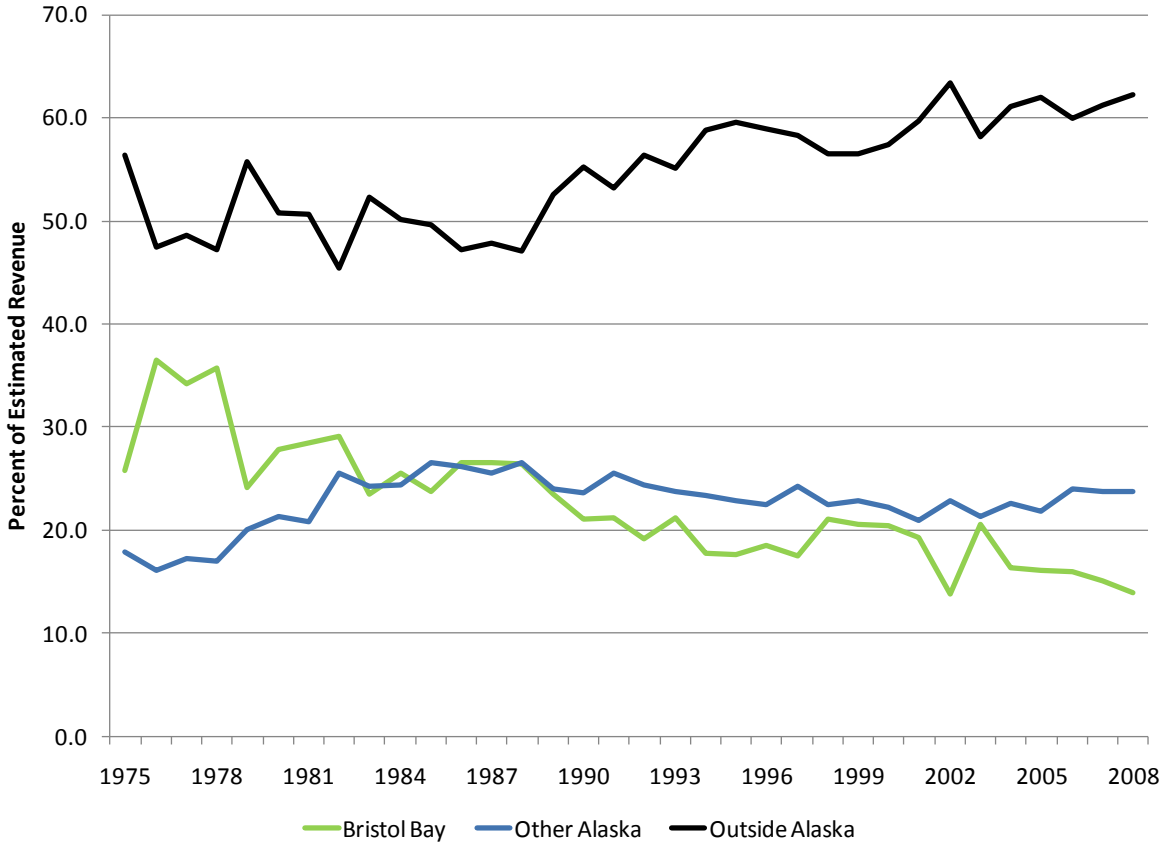
Figure ES-17. Ex-vessel Revenue in the Drift Gillnet Fishery by Region of Residence, 1975 – 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

This figure shows each residence group's revenue as a percent of total revenue in the drift gillnet fishery. The percentages closely track percentages of pounds landed by each residence group, except that the differences in average revenues per pound means that residents of Bristol Bays have received slightly lower revenues as a percent of total compared to their percentage of pounds, while residents from other areas have received slightly higher revenues as a percent total revenue, than their percentage of total pounds.

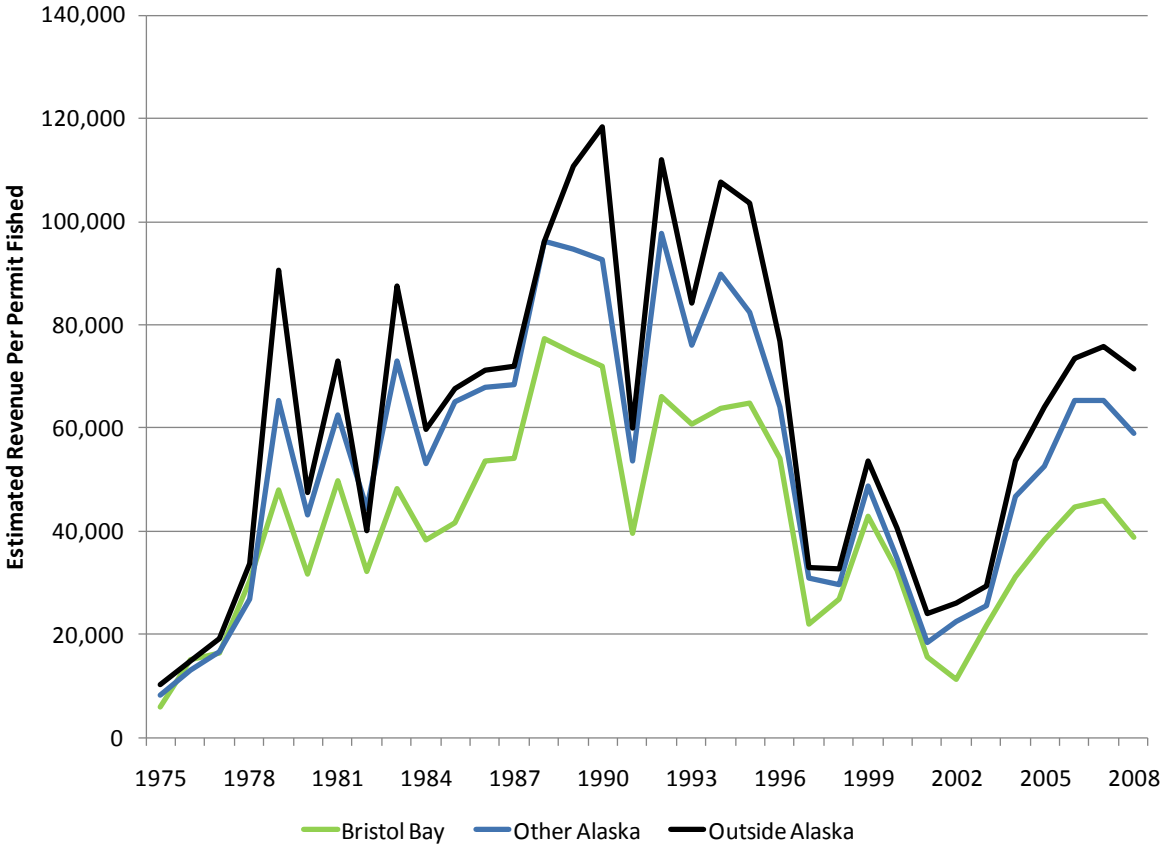
Figure ES-18. Percent of Total Revenue in the Drift Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

As one would expect, the average revenue figures for permit holders by region mimics the average harvest trends in pounds per permit by region. From 2002 to 2008, the average permit holder from the watershed has generated only 58 percent of the revenue generated by the average permit holder from Outside Alaska and only 69 percent of the revenue generated by the average Alaska permit holders living outside the watershed. We do not have data that can fully explain these differences, but they are primarily due to lower overall catches per permit and not due to lower ex-vessel prices.

Figure ES-19. Average Revenue per Permit Fished in the Drift Gillnet Fishery by Residence, 1975 - 2008

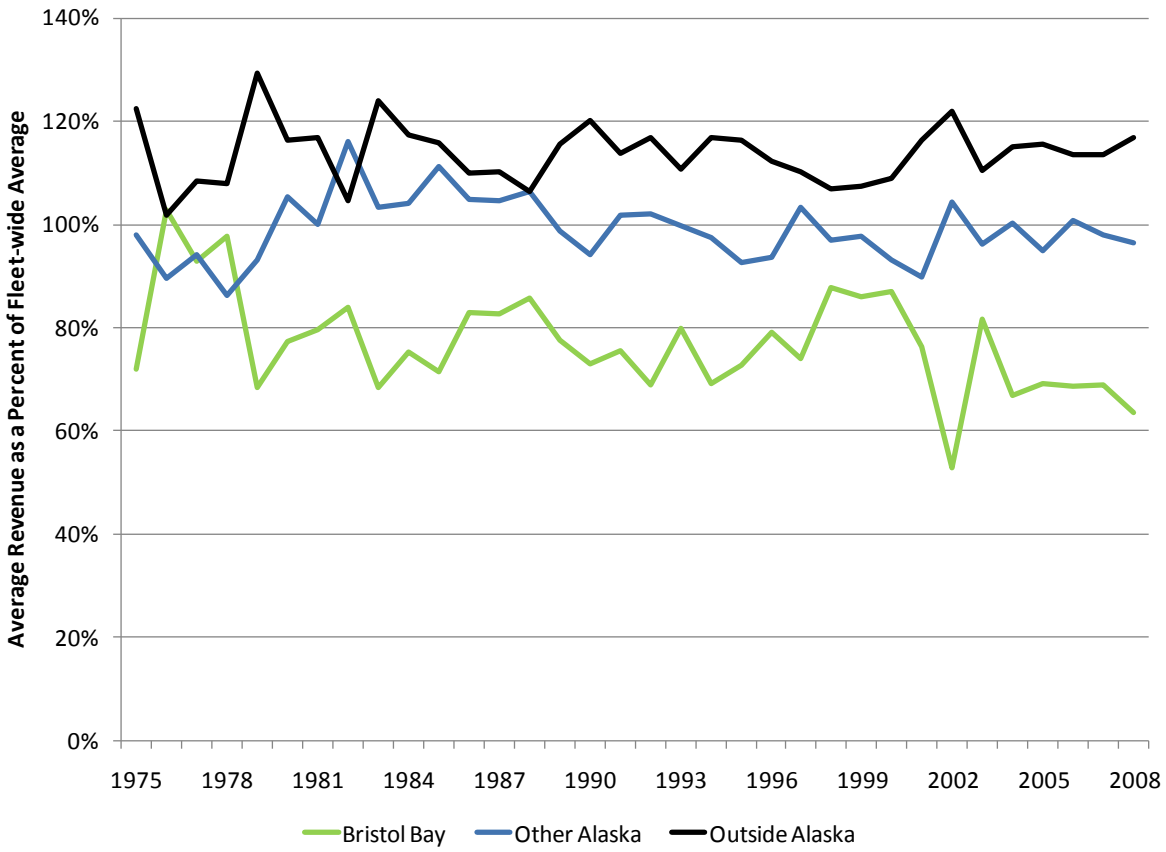


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The figure below displays the data discussed above in slightly different format.

- On average, a permit holder from outside of Alaska earns nearly 120 percent of the average revenue per permit for the fishery as a whole.
- On average, a permit holder from Alaska, but outside of the Bristol Bay region earns roughly the average revenue per permit for the fishery as a whole.
- On average, a permit holder from Bristol Bay region earns roughly 60 to 80 percent of the average revenue per permit for the fishery as a whole. From 2002 – 2008, the average permit holder from the watershed earned only 67 percent of the fishery-wide average.

Figure ES-20. Average Revenue by Residence as a Percent of Fishery-Wide Average Revenue, 1975 – 2008

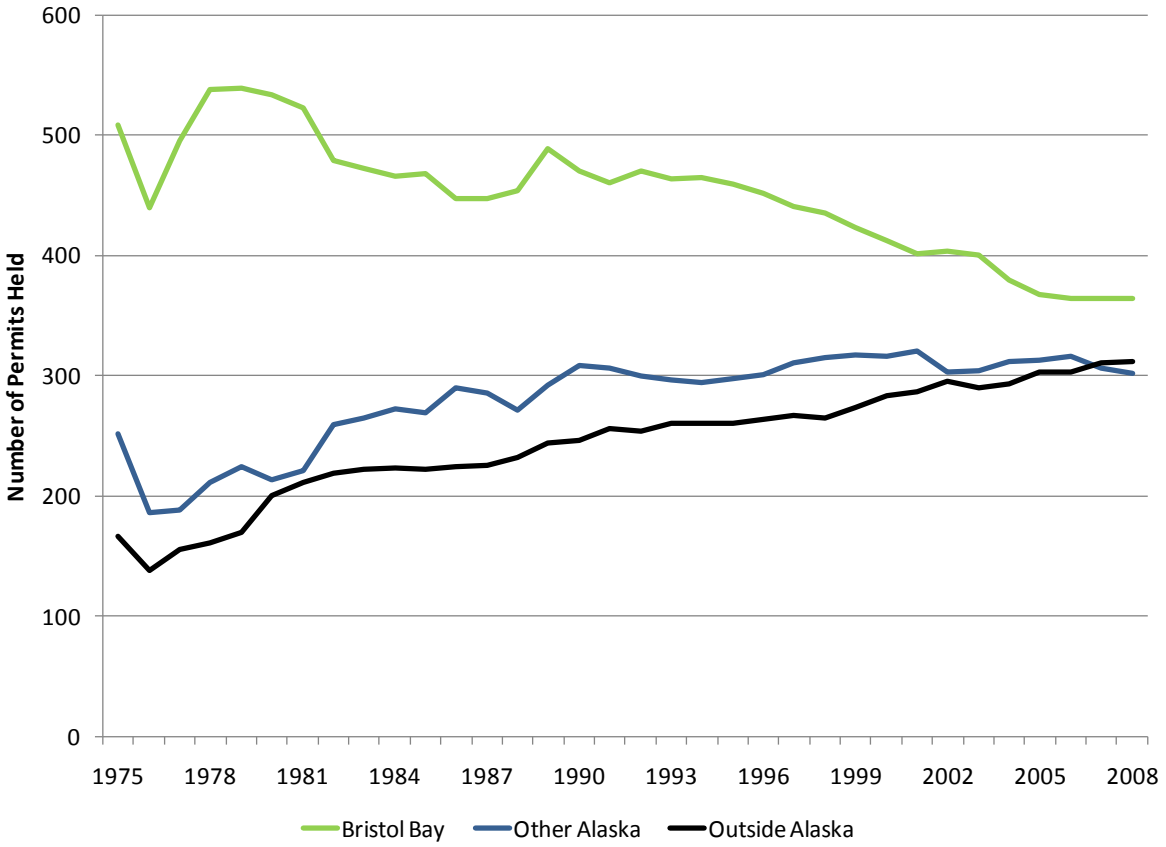


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The Set Gillnet Fishery

The out-migration of set gillnet permits from the Bristol Bay region is similar to the out-migration of drift gillnet permits with several important differences. First, the out-migration of set net permits was nearly zero in 2002 and 2003 then increased significantly during 2003 to 2004, and has been relatively flat from 2006 to 2008. Second, the destination of out-migrating permits has been roughly equally distributed between the "Other Alaska" and "Outside Alaska" groups. Third, Bristol Bay set net permit holders are still the largest of the three groups.

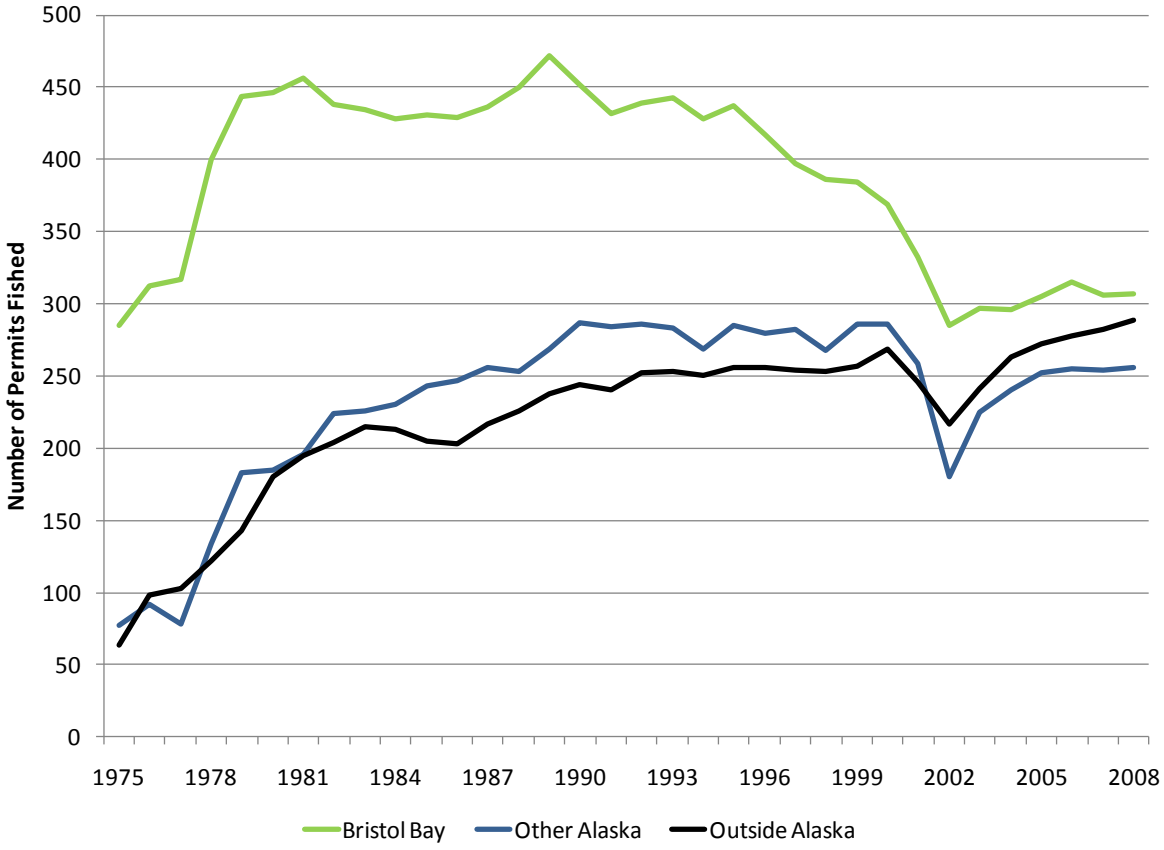
Figure ES-21. Number of Set Gillnet Permits Held By Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

As with drift gillnet permits, the decline in participation rates seen in 2000, 2001, and 2002 was caused by the prospect of low ex-vessel prices. Surprisingly, the declines for watershed residents and other Alaska residents were greater than declines for residents of other states. Participation of Other Alaska residents and permit holders from outside Alaska rebounded in 2003, but a similar rebound was not seen for residents of the watershed. This could be partially explained by the relatively sharp decline in resident ownership of permits seen in 2004 and 2005.

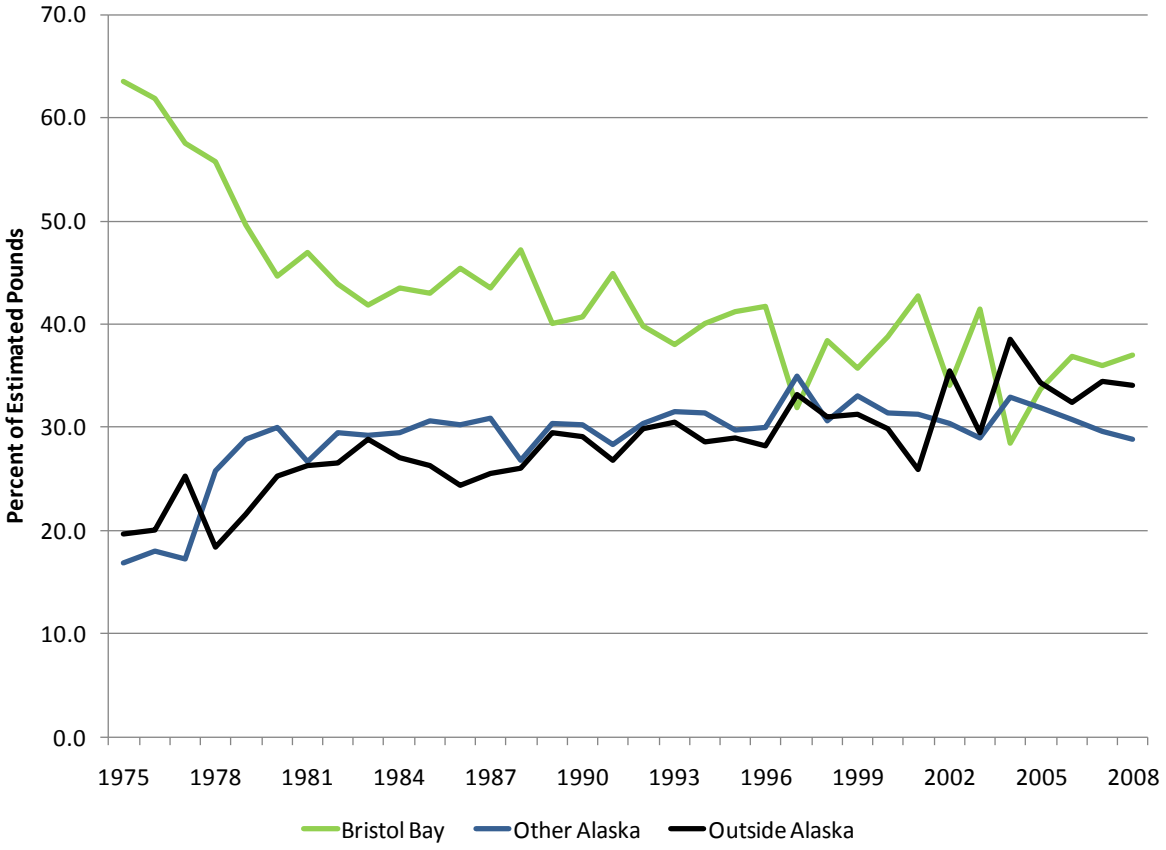
Figure ES-22. Number of Set Gillnet Permits Fished By Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The percentage of pounds harvested by residents of each region reflects ownership and participation rate data shown in the previous slides. In the long term, the portion caught by permit holders belonging to groups from outside of the Bristol Bay region is increasing while the portion harvested by permit holders from the Bay is decreasing. Since 1992 the average percentage harvested by residents of the watershed appears to have stabilized varying on either side of roughly 37 percent of the total.

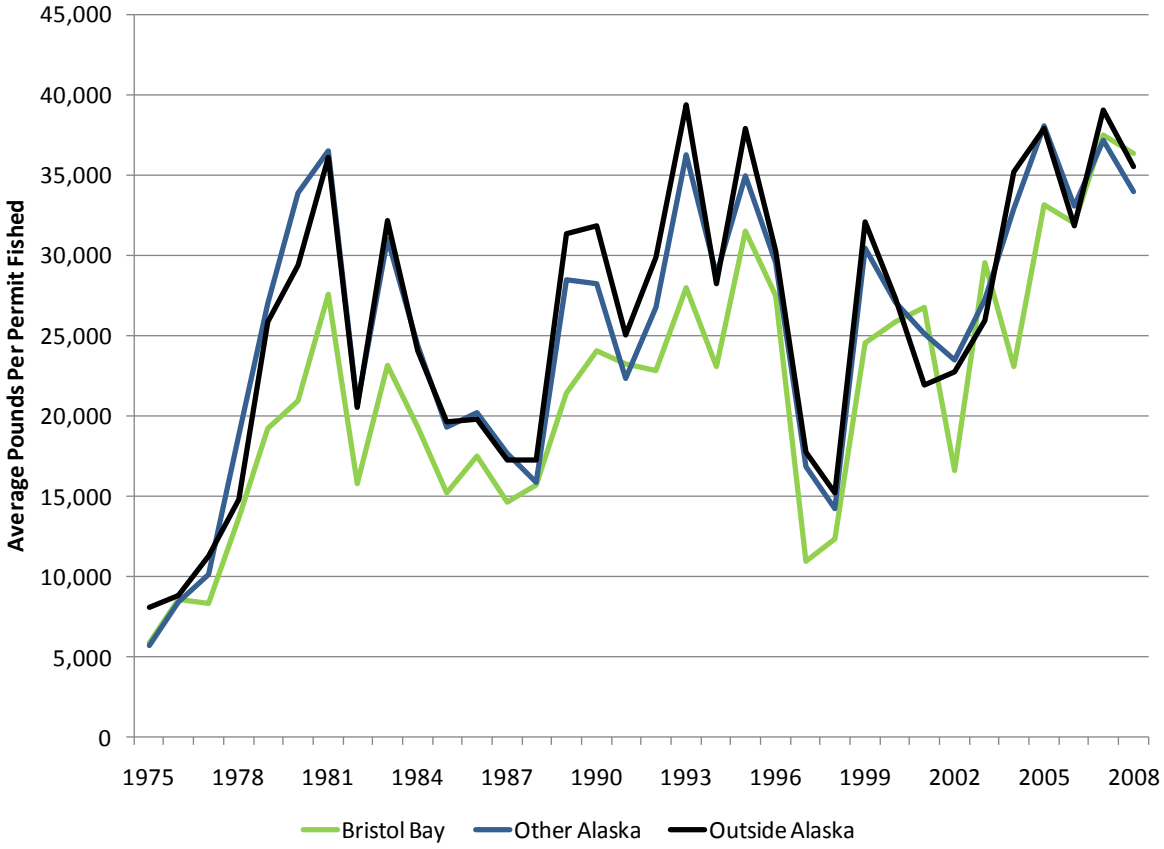
Figure ES-23. Percent of Total Pounds Harvested in the Set Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

Historically, Bristol Bay set gillnet permit holders have harvested slightly less per permit than permit holders who live in other regions. However, unlike drift gillnet permit holders, this gap has narrowed significantly in recent years and even disappeared in 2001, 2003, and 2008.

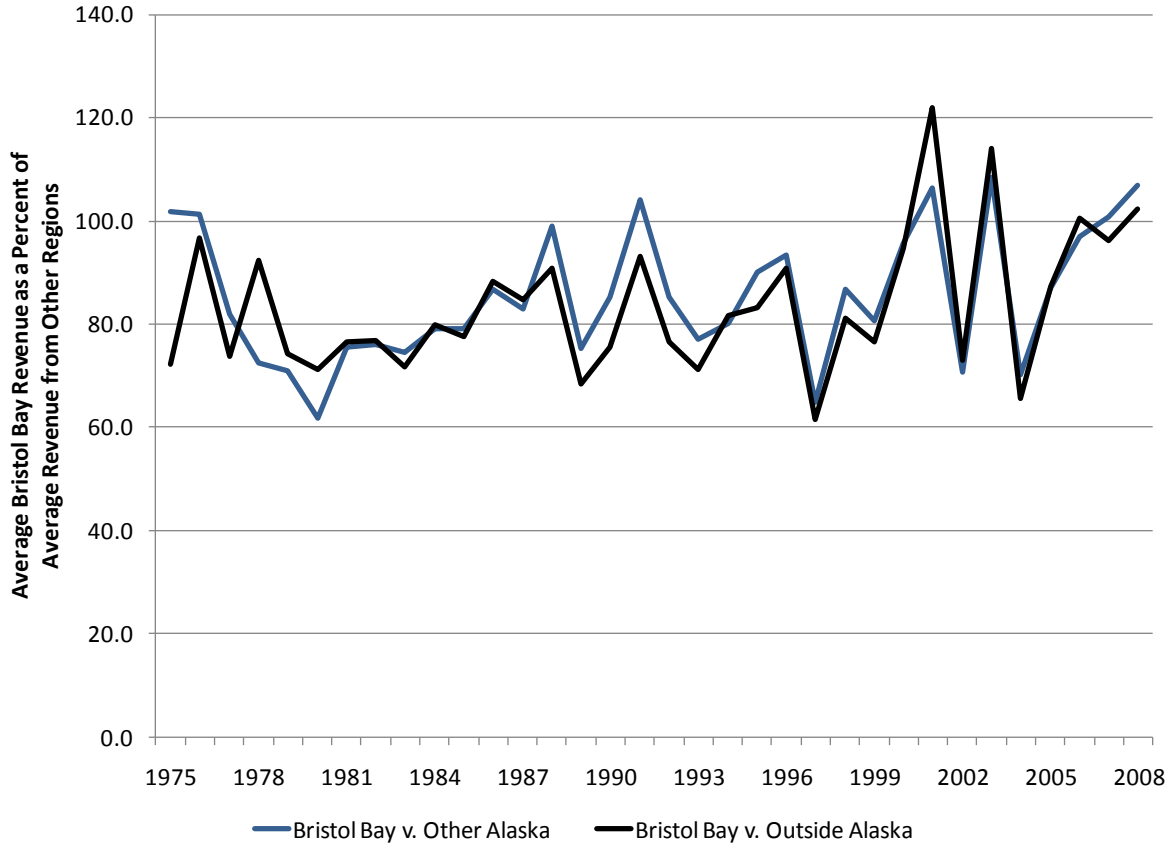
Figure ES-24. Average Pounds per Permit Fished in the Set Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

As noted above, the gap in average pounds per set gillnet holder as a percentage of the average catch by permit holders from other regions has narrowed in recent years. In the early 1980s the gap was as high was 30 to 40 percent, but now Bristol Bay set net permit holders are as successful or more successful than permit holders in other groups in certain years. In the figure below, any time one of the lines crosses 100 percent, average harvests by Bristol Bay Permit holder are greater than averages for the other region—this relative performance improvement contrasts starkly with the increasing gap seen in the drift gillnet fishery. We believe a reason for this is that the set gillnet fishery is less technologically dependent than the drift gillnet fishery, and any advantage permit holders from outside the region might derive from increased access to capital (i.e., loans) would not translate into the same performance gains in the set gillnet fishery as it would in the drift gillnet fishery.

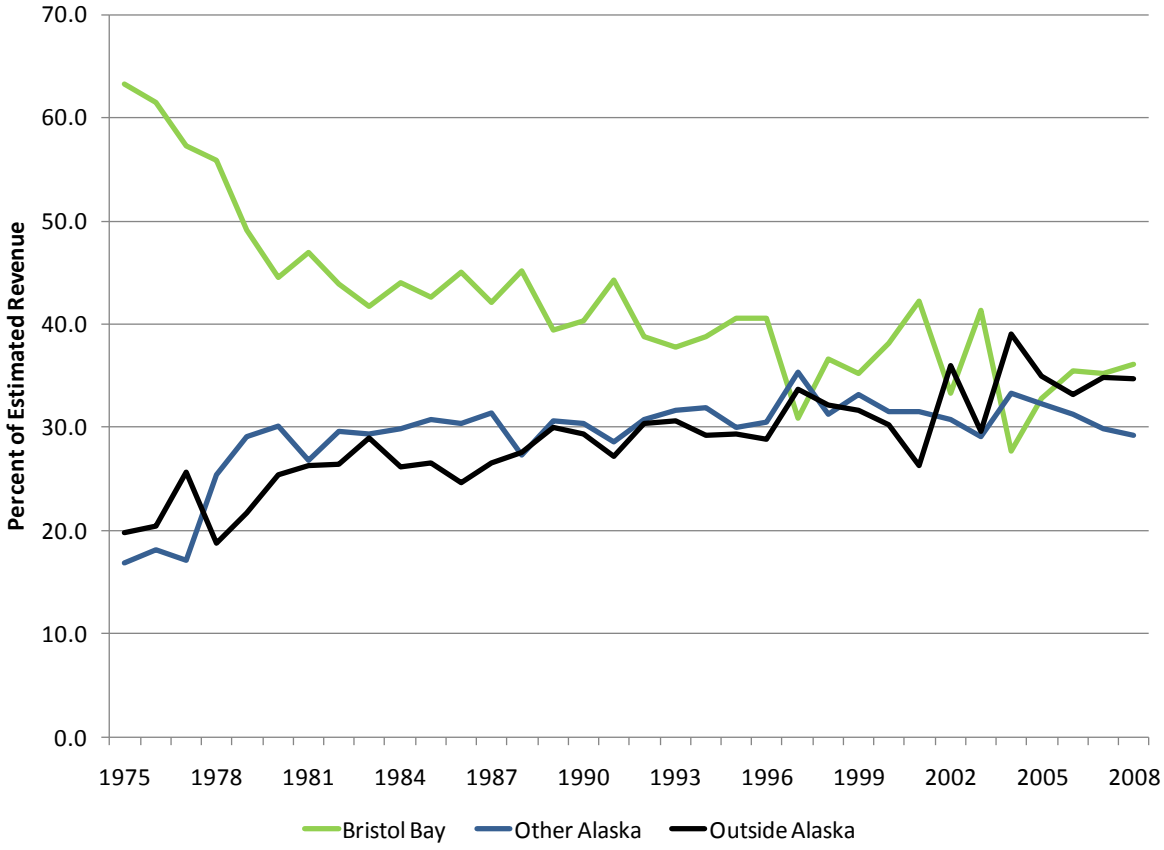
Figure ES-25. Average Lbs / Permit by Watershed Residents as a Percent of Average Lbs per Permit of Other Regions, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The percentage of set gillnet revenue associated with residents of each region reflects ownership, average catch, and participation rate data. While watershed residents receive slightly less per landed salmon, the revenue per pound differential is less of a factor than with the drift fishery. In general, the average proportion of total revenue going to each of the three regions shown has remained relatively stable since 1997.

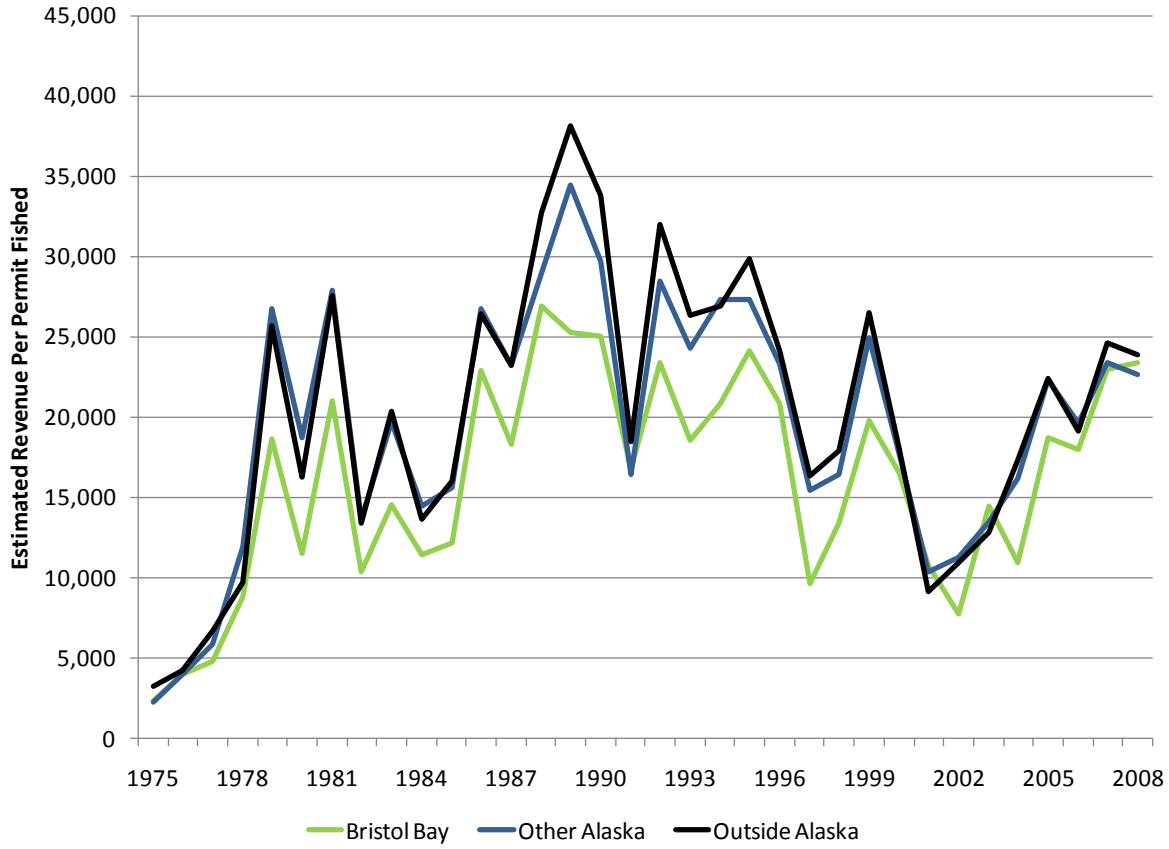
Figure ES-26. Percent of Total Revenue in the Set Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

Historically, Bristol Bay set gillnet permit holders have earned slightly less revenue per permit fished, but the group has narrowed or eliminated that performance gap in recent years.

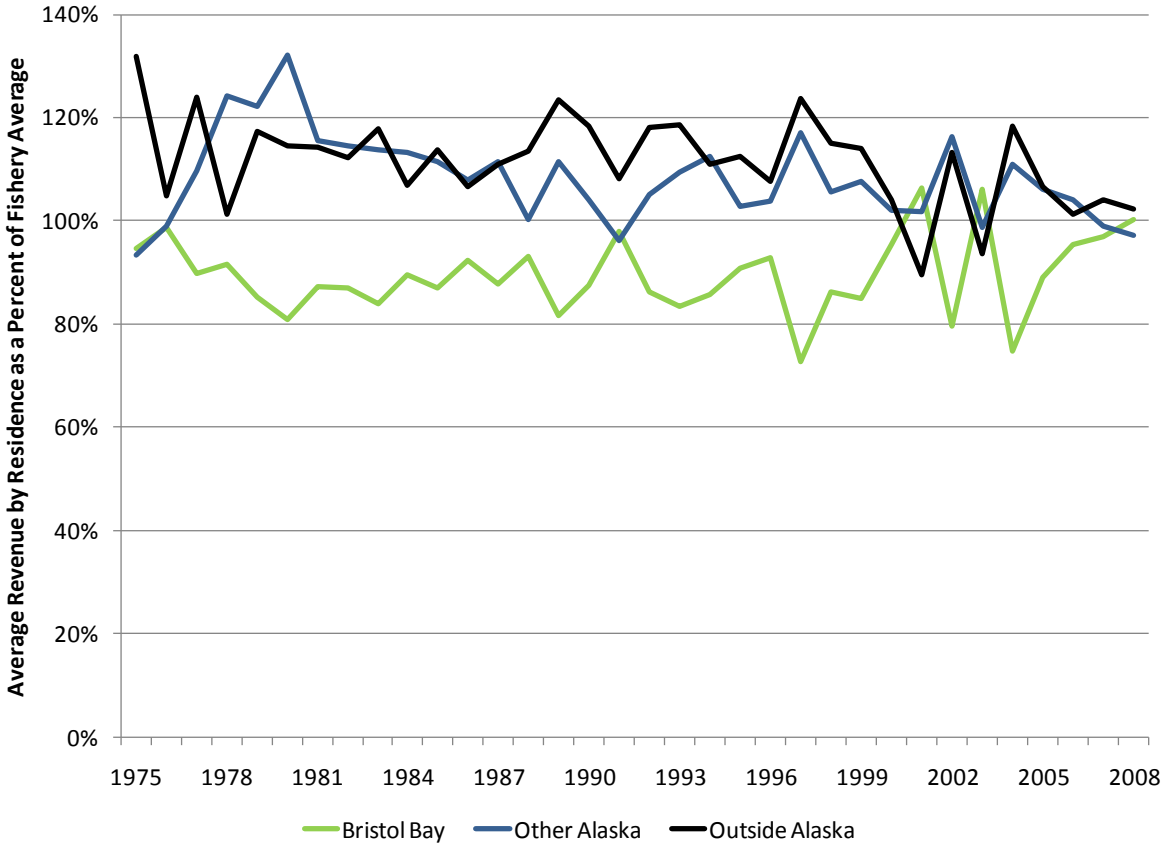
Figure ES-27. Average Revenue per Permit Fished in the Set Gillnet Fishery by Residence, 1975 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The increasing relative performance of Bristol Bay set gillnet permit holders has resulted in a narrowing of the revenue gap as a portion of the average permit holder. In the past, permit holders from outside the Bristol Bay Region were likely to generate above-average revenues while local permit holders generated below-average revenues. In recent years, that gap has shown signs of disappearing but there are still years where a revenue gap exists.

Figure ES-28. Average Set Gillnet Revenues by Residence as a Percent of Fishery-Wide Average, 1975 - 2008

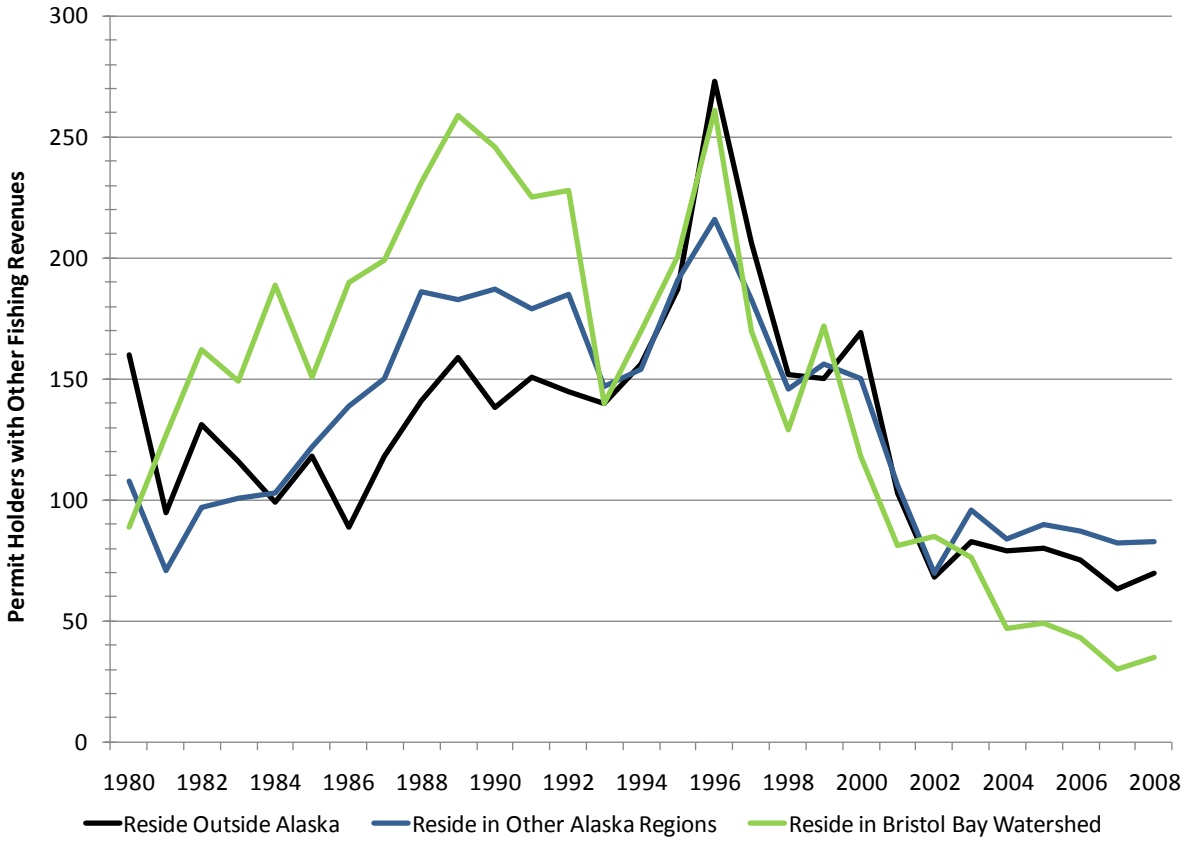


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

Other Fishery Revenue and Employment

The study obtained data from CFEC which show the number of Drift or Set Gillnet permit holders by region with revenue in other Alaska fisheries. The data show a decline in participation in other fisheries among all groups beginning in 1996. However, the decline among non-Bristol Bay groups appears to have stabilized since 2001, while the number has continued to decline for permit holders from the Bristol Bay region.

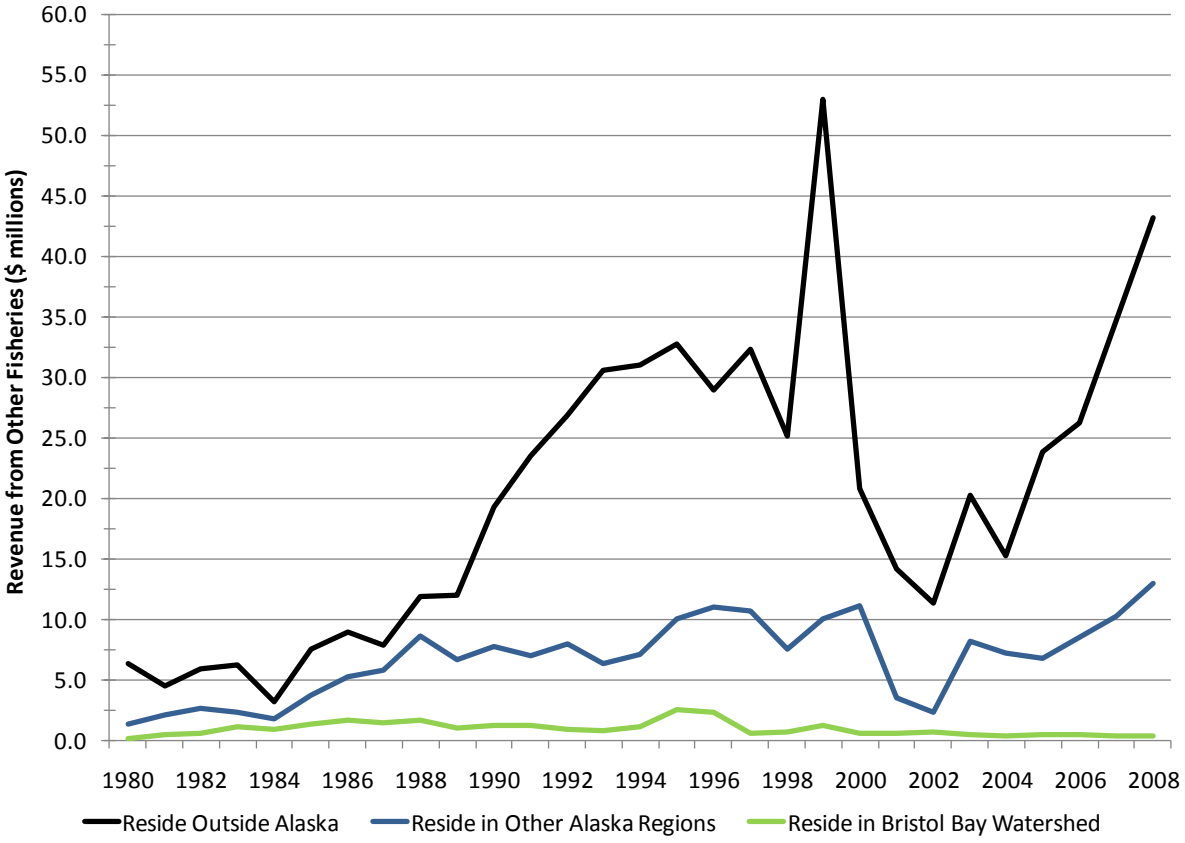
Figure ES-29. Bristol Bay Salmon Permit Holders with Revenue in Other Fisheries by Residence, 1980 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 2009).

Revenue earned by Area T permit holders that participate in other Alaska fisheries is highly skewed toward permit holders that live outside the watershed, particularly since around 1988. Many of the non-watershed residents appear to have diversified into groundfish, crab and halibut fisheries in the Bering Sea and Gulf of Alaska, while residents of the watershed appear to have remained in more localized fisheries. The change is most dramatic for residents from outside Alaska.

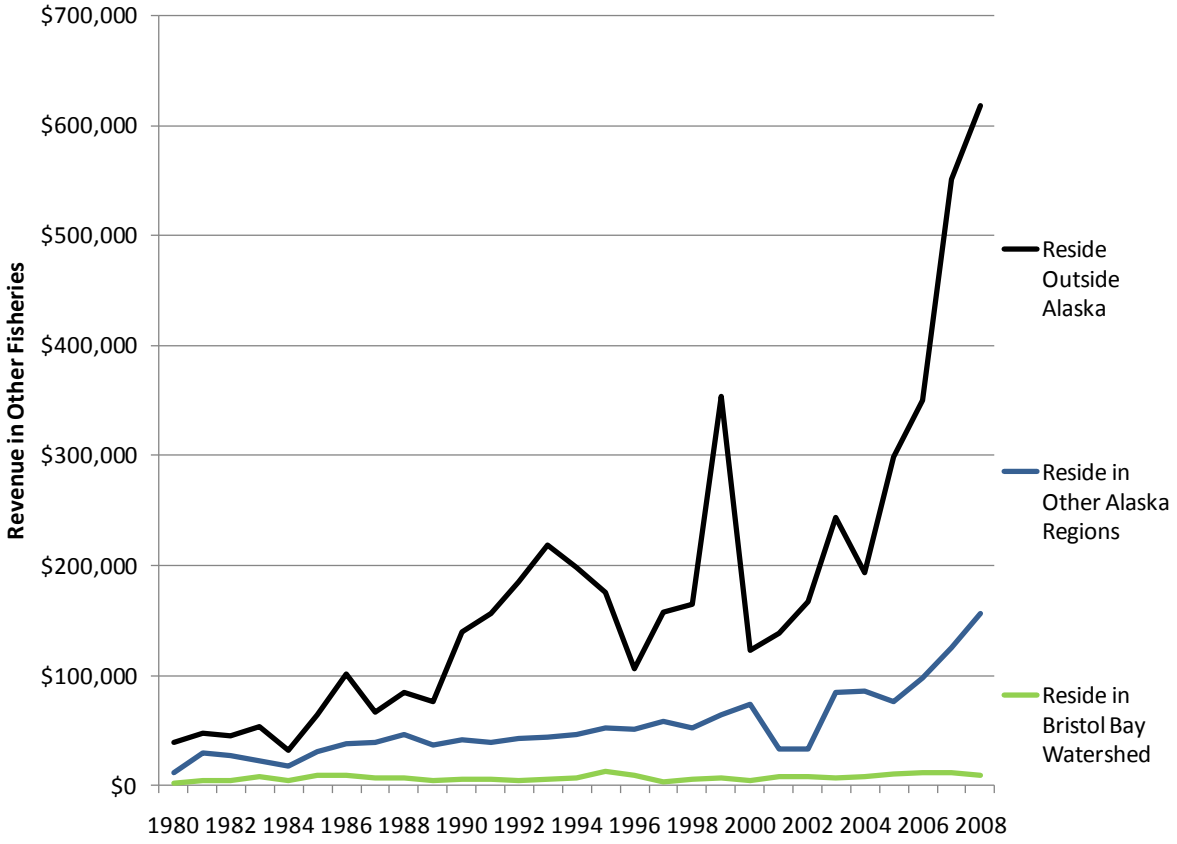
Figure ES-30. Revenue of Bristol Bay Salmon Permit Holders in Other Fisheries by Residence, 1980 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 2009).

This figure combines the data from the previous two figures to show that average amount of revenue that Bristol Bay permit holders who were active in other fisheries earned. In this decade, the average earnings in other fisheries for Bristol Bay residents was $8,500; during the same period, Bristol Bay permit holder residing in of other parts of Alaska earned an average of $85,000, while non-Alaska permit holders generated an average of over $225,000.

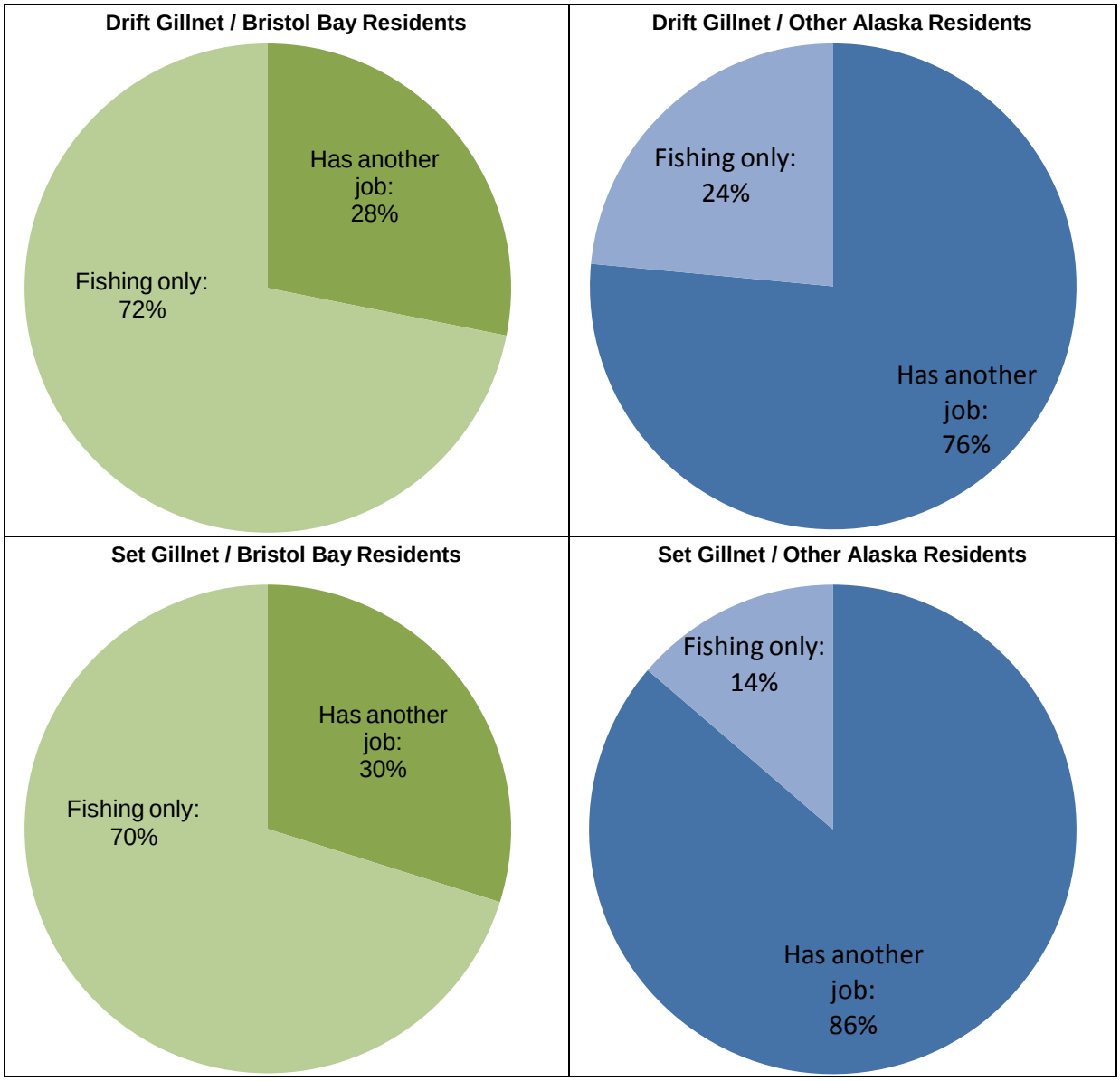
Figure ES-31. Average Revenue of Bristol Bay Permit Holders in Other Fisheries by Residence, 1980 - 2008



Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 2009).

This figure provides a snapshot from 2006 of other wage and salary employment of Bristol Bay drift and set gillnet permit holders that reside in Alaska. Similar data for residents of other states were not available. The data were compiled by the Alaska Department of Labor and Workforce Development (ADOLWD) using names, and birth dates, and places of residence from lists of permit holders obtained from CFEC. The data show that 28 percent (97) of the 398 drift gillnet permit holders residing in the watershed were found in ADOLWD files that list wage and salary employment. In the set gillnet fishery 30 percent (94) of the 315 local permit holder were found to have had another job. The contrast between residents of the the watershed and other residents of Alaska is significant. Of the 353 drift permit holders residing in other parts of Alaska, 76 percent (270) were found to have other wage and salary jobs. Similarly 86 percent (220) of the 255 non-watershed residents of Alaska had other jobs in 2006.

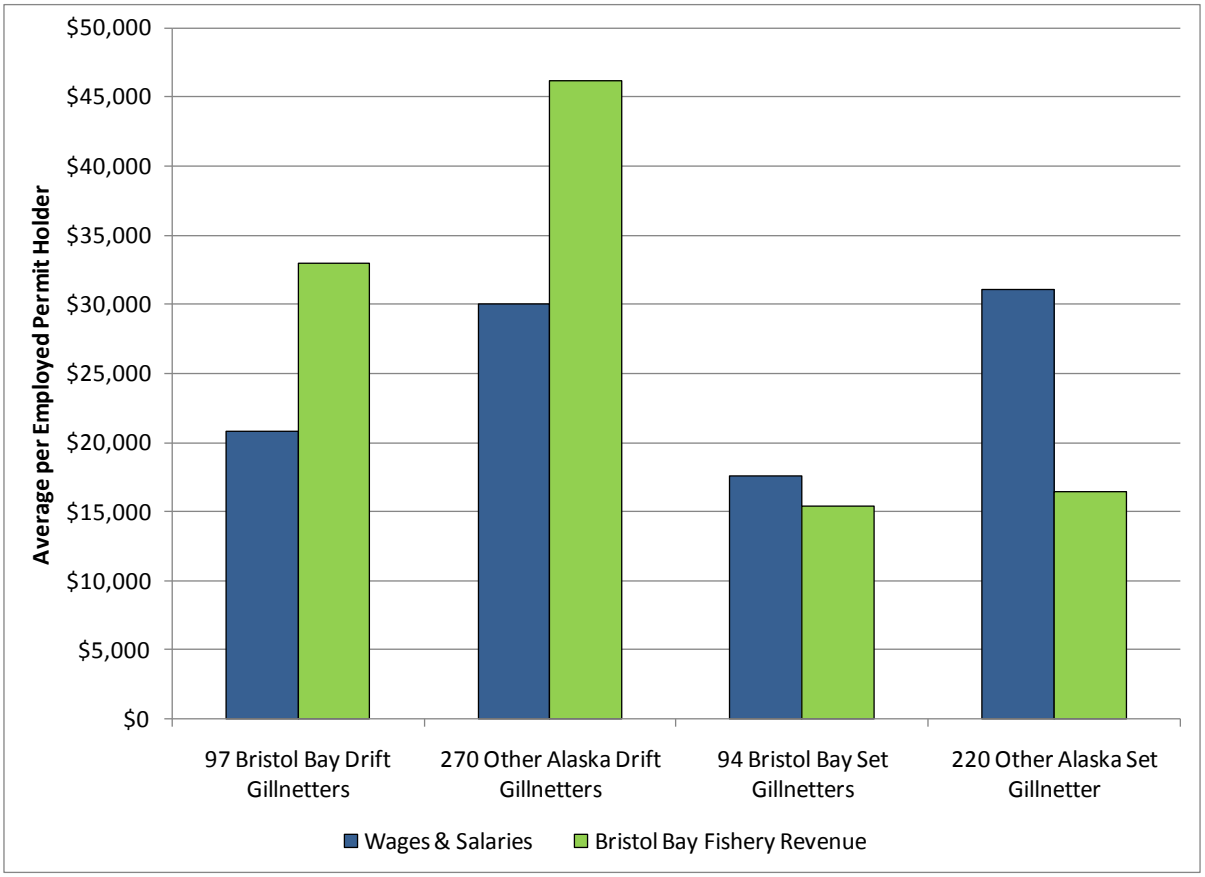
Figure ES-32. Wage and Salary Employment of Drift and Set Gillnetter Residing in Alaska, 2006



Source: Figure developed by Northern Economics based on data from ADOLWD (ADOLWD, 2009).

In general, gillnetters with other jobs had gross fishery revenues that were about on-third higher than their wages and salaries. On average, the 97 resident gillnetters that had other wage and salary jobs in 2006 earned a little more than $20,000 in wages and salaries and had gross fishery revenues of $33,000. The 270 non-resident Alaskan gillnetters averaged $30,000 in wages and salaries, and on average grossed $46,000 in the fishery. Setnetters from both areas earned more in their wage and salary jobs than they grossed in their fisheries.

Figure ES-33. Income and Revenues of Alaska Resident Permit Holders in Bristol Bay Fisheries with Other Wage/Salary Employment, 2006



Source: Figure developed by Northern Economics based on data from ADOLWD (ADOLWD, 2009).

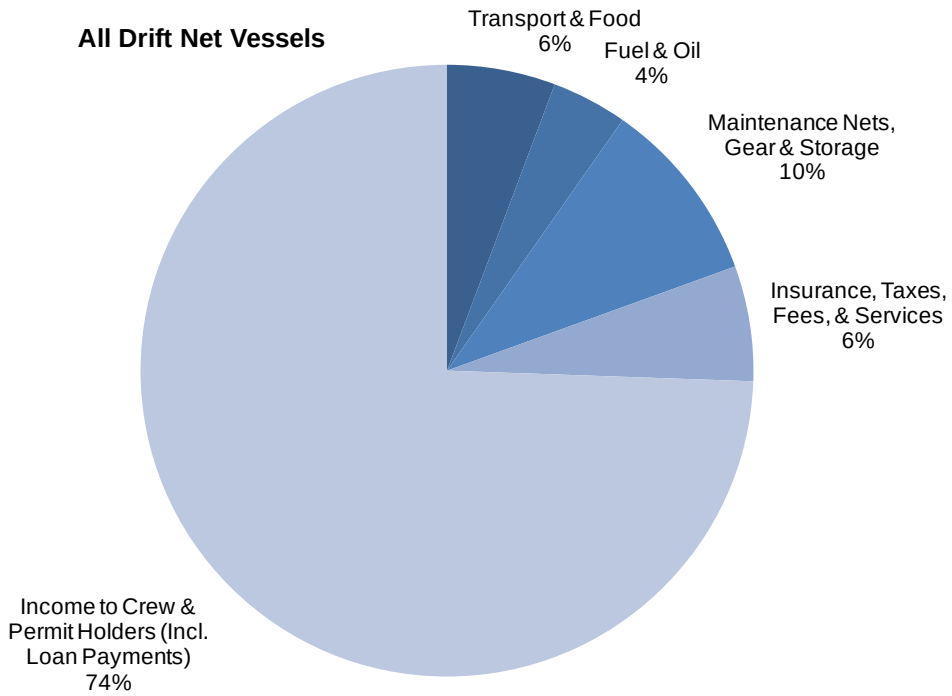
Operating Costs

In this section, we describe operating costs in the drift and set gillnet fisheries. While a more detailed analysis of operating costs was deleted from the scope of work, it was necessary to develop estimated operating costs in order to estimate the economic contribution and multiplier effects of fish harvesting to the region's economy. Our estimates of operating costs relied on a survey conducted by the CFEC during their optimal numbers study and later augmented by Northern Economics during the 2003 Bristol Bay Salmon Fishery Restructuring Study and our Staltonstal-Kennedy projects in 2004. Both these projects were supported by the Bristol Bay Economics Development Corporation (BBEDC).

We updated the cost estimates from 2003 by applying indexes that take into account changes in the cost of production due to inflation. We developed our own fuel price index based on data from the State's Power Cost Equalization (PCE) program. All other operating costs from 2003 were adjusted based on the US producer price index (PPI) for seafood processing businesses.

The figure below provides a breakdown of estimated operating costs and income to crew and permit holders in the drift gillnet fishery for 2008. Incomes to crew members and permit holders accounted for 74 percent of gross revenue with crew shares accounting for 19 percent. Surprisingly, fuel was only 4 percent of gross revenues (15 percent of overall non-crew costs) even though our index for fuel nearly doubled from 2003 to 2008. In 2003, the year of the CFEC survey, fuel was 9 percent of overall non-crew costs. It should be noted that loan payments for permits and vessels and all other interest costs were not explicitly estimated, but are assumed to be paid from the amount estimated as income to permit holders. We estimated that the permits in the Bristol Bay fishery had a total of just over $16,000 in the operating costs shown in the figure not including payments to crew.

Figure ES-34. Breakdown of Drift Gillnet Operating Costs and Incomes to Crew and Permit Holders for 2008

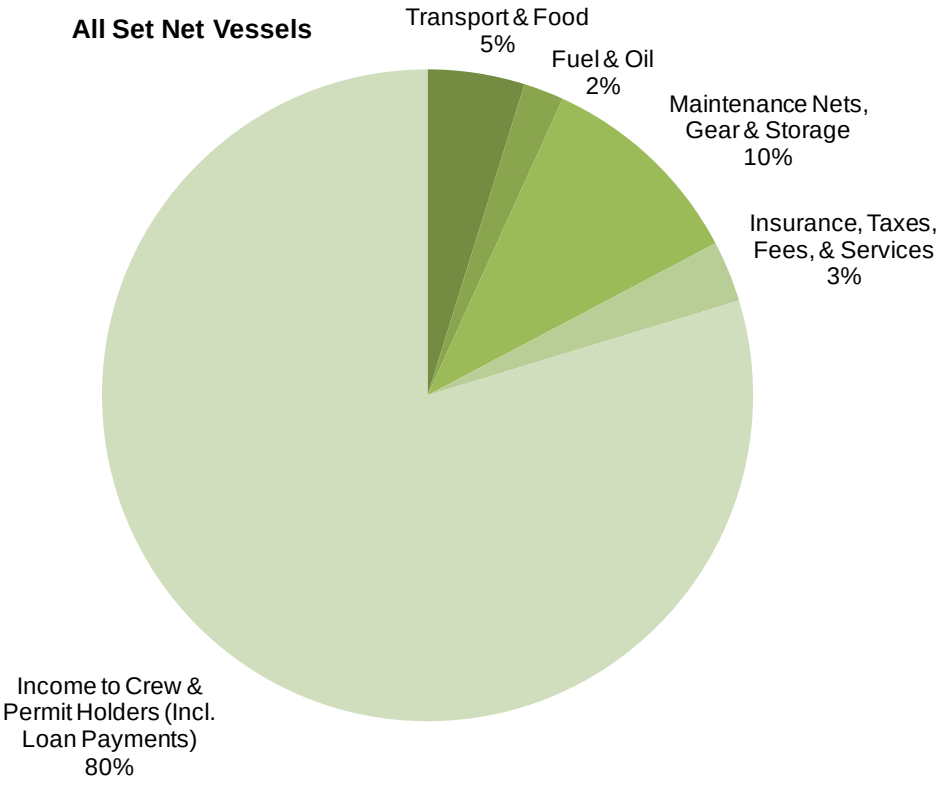


Source: Figure and data developed by Northern Economics based on data originally from CFEC (CFEC, 2002) as well as information from AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 1980 - 2008).

This figure shows a breakdown of set gillnet operating costs. We used the same basic methodology to estimate costs for the set net fishery, but because the CFEC did not conduct a survey of the set gillnet fishery, we relied much more heavily on data from the Restructuring Study as the basis for cost information. As with the drift fishery, costs have been adjusted using indexes for fuel (based on PCE costs in the region) and the US producer price index for seafood processing.

The set net fishery is less costly to operate than the drift fishery. We estimated that in 2008 the average set net operation spent just under $5,000 in non-crew costs, or roughly 20 percent of gross revenue. The largest portions of these costs are for gear, maintenance and equipment storage.

Figure ES-35. Breakdown of Set Gillnet Operating Costs and Incomes to Crew and Permit Holders for 2008



Source: Figure and data developed by Northern Economics based on data originally from earlier work by Northen Economics in (Northern Economic, Inc, 2003), as well as information from AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 1980 - 2008).

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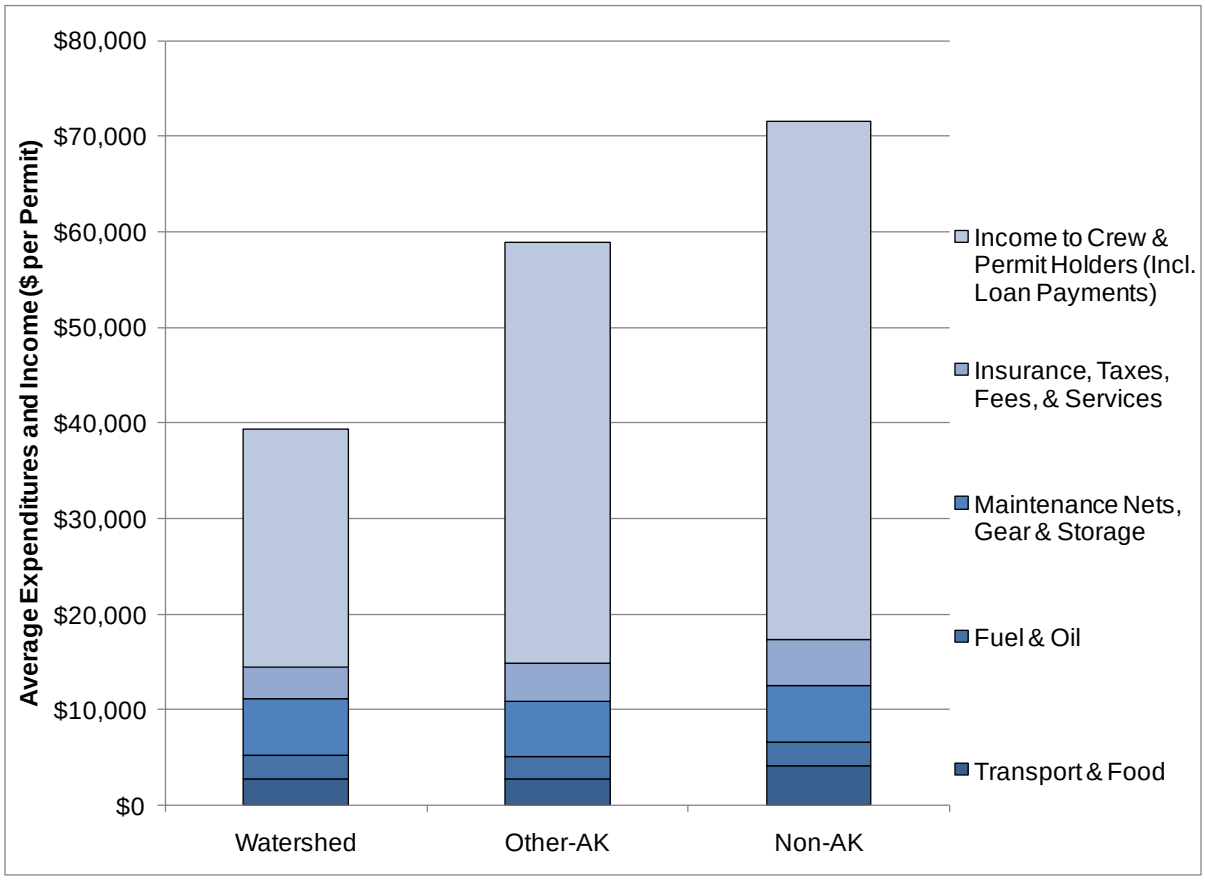
In the process of estimating the economic contribution (multiplier effects) of fish harvesting in the region, we need to break down operating costs by the permit holder's region of residence. Again, this was not a key component of the study, but because we developed the information, we thought it would be worthwhile to provide this information to BBEDC. In the figure below, the total height of the bar represents the average gross revenue for permits within each region in 2008. In general, estimated average operating costs (excluding crew costs) are relatively close across the three regions, ranging from $14,500 for permit holders from the watershed to $17,300 for permit holders from outside Alaska. Operating costs excluding crew costs as a percent of gross revenue are estimated to be significantly higher for watershed residents (37 percent) compared to non-Alaska permit holders (24 percent).

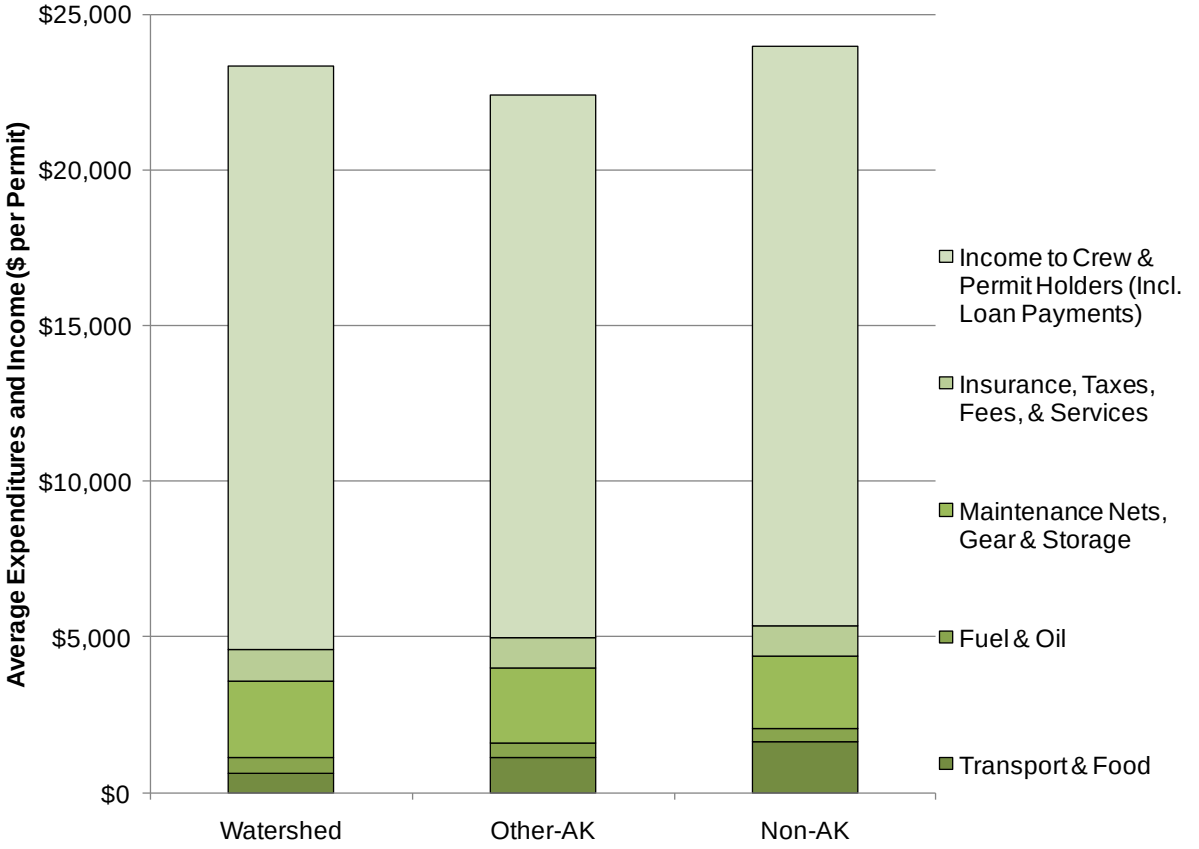
Figure ES-36. Estimated Average Drift Gillnet Fishery Costs and Income per Permit by Region, 2008



Source: Figure and data developed by Northern Economics based on data originally from CFEC (CFEC, 2002) as well as information from AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 1980 - 2008).

Overall, the differences by region in estimated set net operating costs are not significant. Operating costs range from $4,600 for watershed resident to $5,300 for non-Alaska residents.

Figure ES-37. Estimated Average Set Gillnet Fishery Costs and Income per Permit by Region, 2008



Source: Figure and data developed by Northern Economics based on data originally from earlier work by Northen Economics in (Northern Economic, Inc, 2003), as well as information from AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 1980 - 2008).

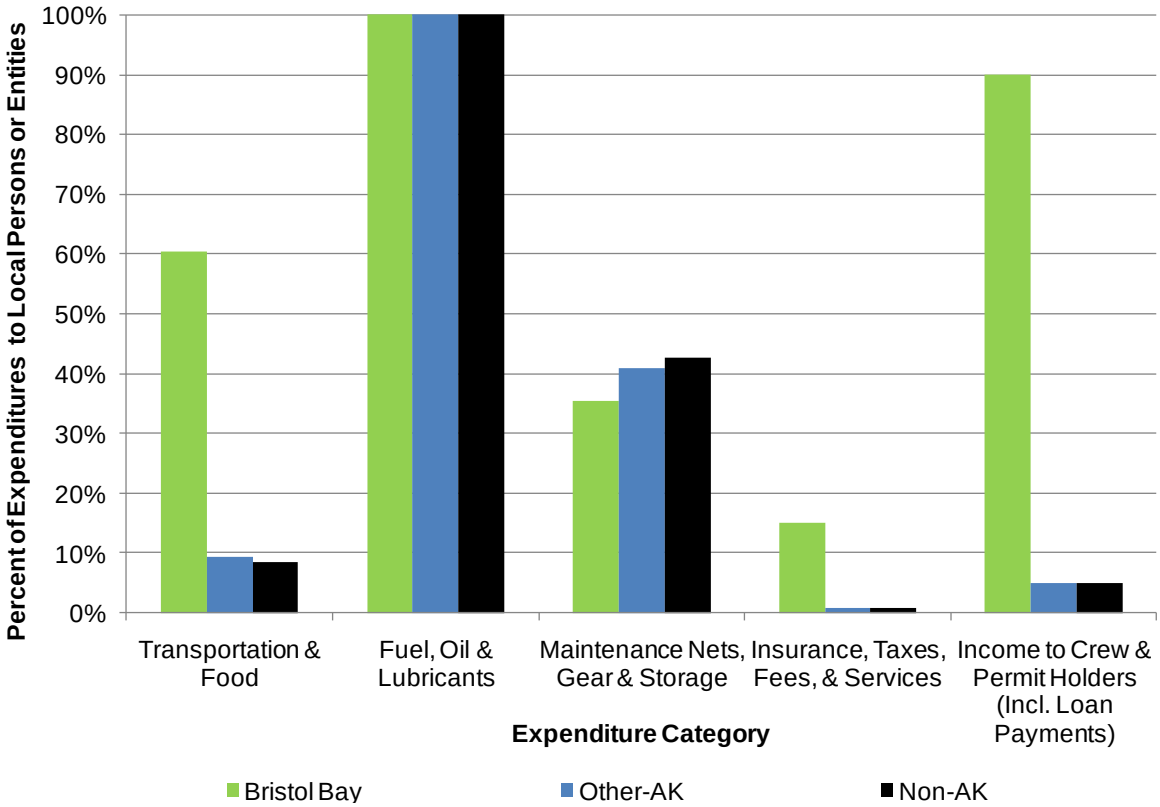
Multiplier Effects

In this section we estimate the economic contribution (multiplier effects) from salmon harvests in Bristol Bay. It should be noted that salmon processing in the region also creates significant levels of economic activity, but that the economic contributions of the processing sector are not included in this study. We have, however, included the economic contributions of fish taxes.

Economic contributions are measured using an input-output model called IMPLAN. The model starts with the total ex-vessel revenue for harvesters and assumes that all revenues are spent on operating costs, or crew payments and income to the permit holders. Local expenditures resulting from purchases of input used in the fishing operations, through household expenditures of local crew and permit holders and through expenditure of tax revenues by local government ripple through the local economy and create additional economic activity or multiplier effects. In the Bristol Bay Region, the multiplier effects are relatively small because very few of the goods or services are produced locally.

The figure below shows our assumptions regarding local expenditures as a percent of total expenditures by category for permit holders in both set and drift gillnet fisheries by region. For example, we assume that 60 percent of transportation and food costs of permit holders residing in the Bristol Bay region are purchased locally, but less than 10 percent of transportation and food costs of permit holders from other regions are made locally. We also assume that while 100 percent of fuel purchases are made within the region, the economic impact is quite small consisting only of the mark-up over the costs of goods sold. Finally, we assume that after deducting 10 percent for federal income taxes, the remainders of payments to local crew and revenues to local permit holders are spent by households within the region.

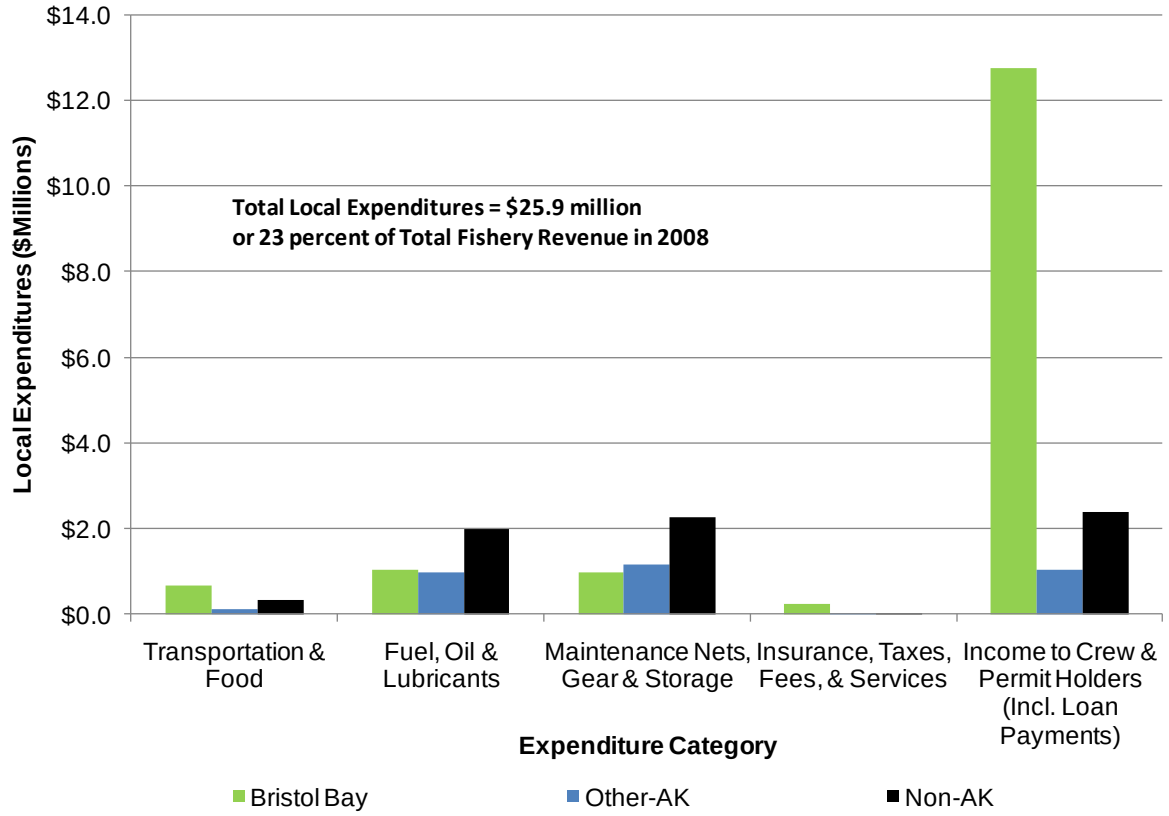
Figure ES-38. Local Expenditure Percentage in each Cost Category by Permit Holder Region in 2008



Source: Figure developed by Northern Economics from discussions with industry and professional experience.

This figure shows the total amount of local spending generated by the harvest of Bristol Bay salmon in the drift and set gillnet fisheries. The largest single contribution is clearly the income generated by local permit holders, which accounts for 49 percent of the $25.9 million spent in local economy by fish harvesters. Of the $110.6 million total revenue generated in 2008 Bristol Bay salmon fisheries, only 23 percent is estimated to be spent locally. It should be reiterated that the local expenditure coefficients were developed by Northern Economics based primarily on our knowledge of the fisheries and the local economy.

Figure ES-39. Total Local Expenditures from Harvesting Bristol Bay Salmon, by Permit Holder Region in 2008

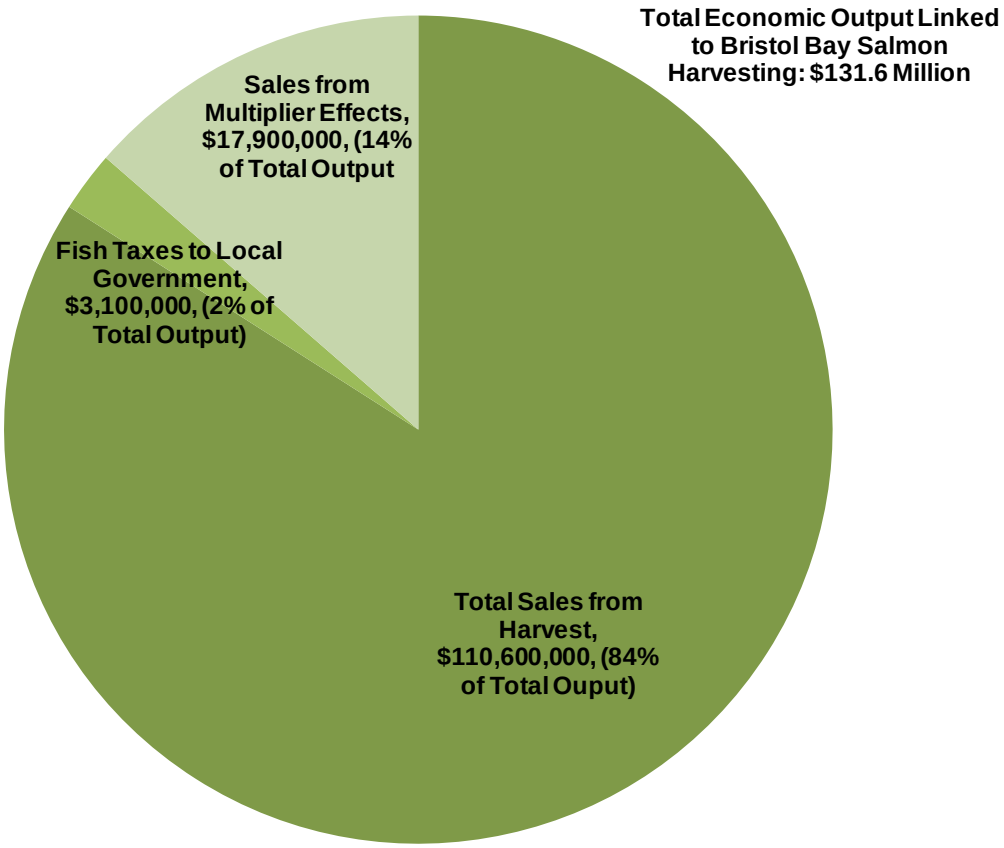


Source: Figure developed by Northern Economics based on discussions with industry, professional experience and on data originally from earlier work by Northen Economics in (Northern Economic, Inc, 2003) as well as information from AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 2002) and (CFEC, 1980 - 2008).

The total economic output that can be directly linked to the harvesting of Bristol Bay Salmon is the sum of all of the sales of harvested salmon (total ex-vessel revenue), as well as all of the sales to harversters that were made by suppliers operating in the region and all of fish taxes generated for local governments or passed through from the state, plus all of the multiplier effects on regional sales resulting from: 1) the local expenditures for harvesting inputs; 2) expenditures by local governments of fish taxes; and 3) household income generated by local crews and permit holders.

We estimated that local governments received $3.1 million from fish taxes based on the most recent information available from ADCCED. We then ran the sum of local expenditures (as estimated earlier) and fish taxes through IMPLAN to generate the multiplier effect. We estimate that $17.9 million is generated in the local economy through the multiplier effect. This brings the total economic contribution from the harvesting of Bristol Bay salmon to $131.6 million. It should be reiterated that the value estimated here does not include the economic contributions from the salmon processing industry.

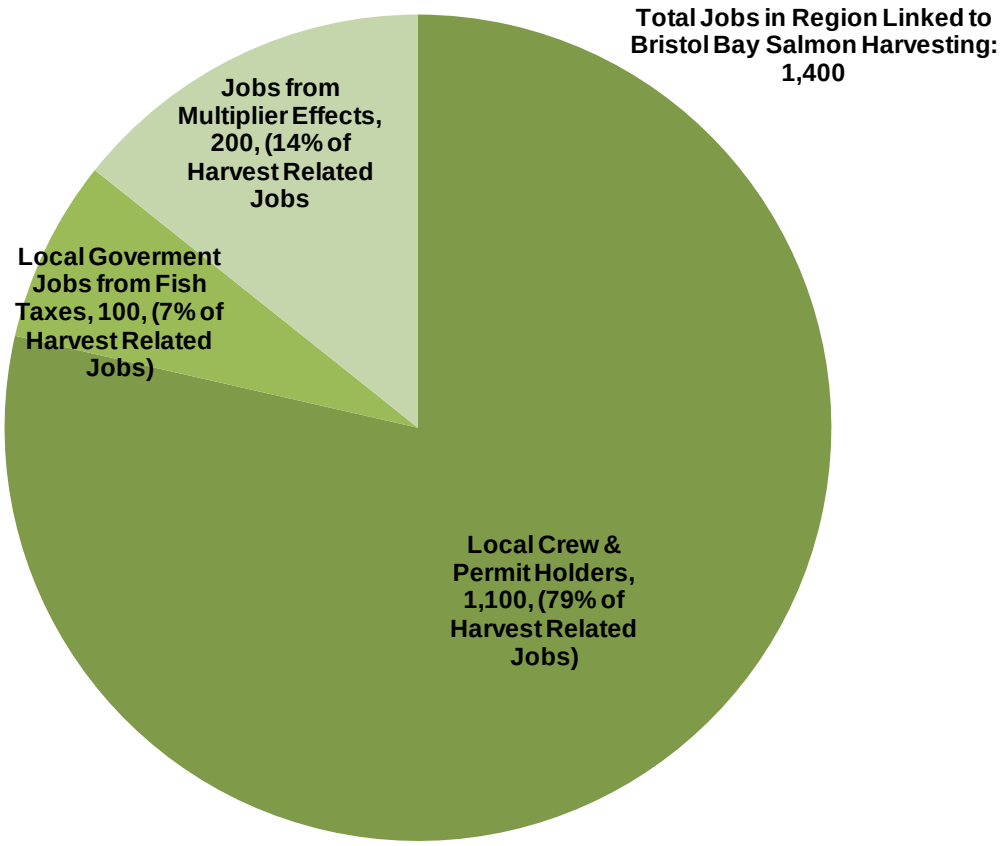
Figure ES-40. Estimated Total Regional Economic Contribution from Bristol Bay Salmon Harvesting, 2008



Source: Figure developed by Northern Economics based on discussions with industry, professional experience and on data originally from earlier work by Northen Economics in (Northern Economic, Inc, 2003) as well as data and information from (IMPLAN, 2008), AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 2002) and (CFEC, 1980 - 2008).

The salmon fishery not only produces direct harvesting jobs (we estimate 1,100 local crew members and permit holders are employed), but the fishery also produces additional jobs in local government through fish taxes and in the region through the multiplier effect. Using IMPLAN we estimated the harvesting of salmon creates approximately 100 jobs in local governments and an additional 200 jobs in the region. Again, it should be noted that we have not included fish processing jobs or other indirect jobs created from the processing of salmon. We should also note that we have not included an estimate for direct crew members jobs created in the set net fishery—set net crew members do not need a crew license, and most often set net crew members are assumed to be members of the permit holder's family.

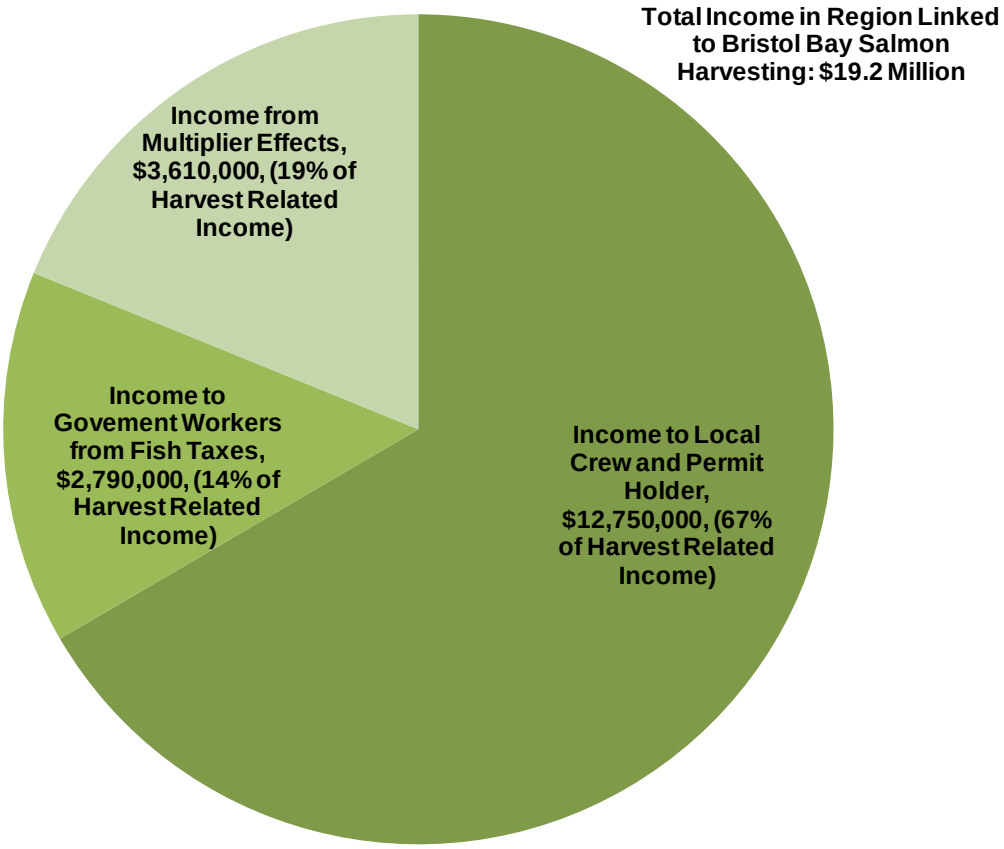
Figure ES-41. Estimated Total Regional Employment from Bristol Bay Salmon Harvesting, 2008



Source: Figure developed by Northern Economics based on discussions with industry, professional experience and on data originally from earlier work by Northen Economics in (Northern Economic, Inc, 2003) as well as data and information from (IMPLAN, 2008), AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 2002) and (CFEC, 1980 - 2008).

We estimated that local permit holders and crew members in the Bristol Bay drift and set gillnet fisheries earned $12.75 million in income. We assume that households spend this income on day-to-day expenses as well as making loan payments on boats permits and equipment. A significant portion of fish taxes goes directly to incomes for government workers ($2.8 million) In addition, the household spending of local permit holders and crew members and local government workers combines with local expenditures on fishery operations to create $3.6 million in additional income for persons working in local businesses. Overall we estimate that $19.2 million in income is generated in the region from salmon harvesting.

Figure ES-42. Estimated Total Regional Income from Bristol Bay Salmon Harvesting, 2008



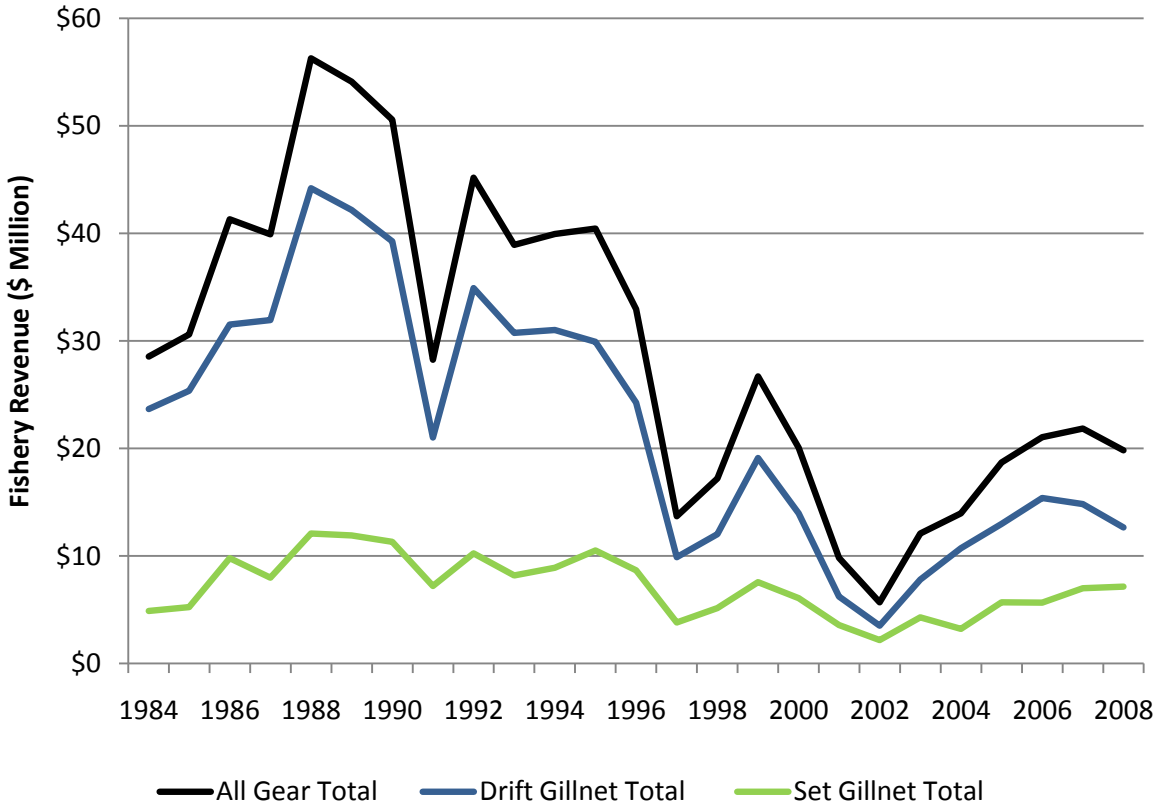
Source: Figure developed by Northern Economics based on discussions with industry, professional experience and on data originally from earlier work by Northen Economics in (Northern Economic, Inc, 2003) as well as data and information from (IMPLAN, 2008), AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 2002) and (CFEC, 1980 - 2008).

Per Capita Revenue

Our bottom line is developed by combining gross fishery revenues from both the drift and set gillnet fisheries and after adjusting for inflation developing an estimate of the per capita revenue derived from local harvests in the Bristol Bay salmon fishery.

This figure combines gross revenues of watershed residents for both the drift and set gillnet fisheries. The drift fishery has been much more volatile than the set net fishery. Overall there has been a markedly downward trend in total revenue from the 1980's and early 1990's.

Figure ES-43. Total Revenue from Harvesting of Permit Holders from the Region, 1984 – 2008

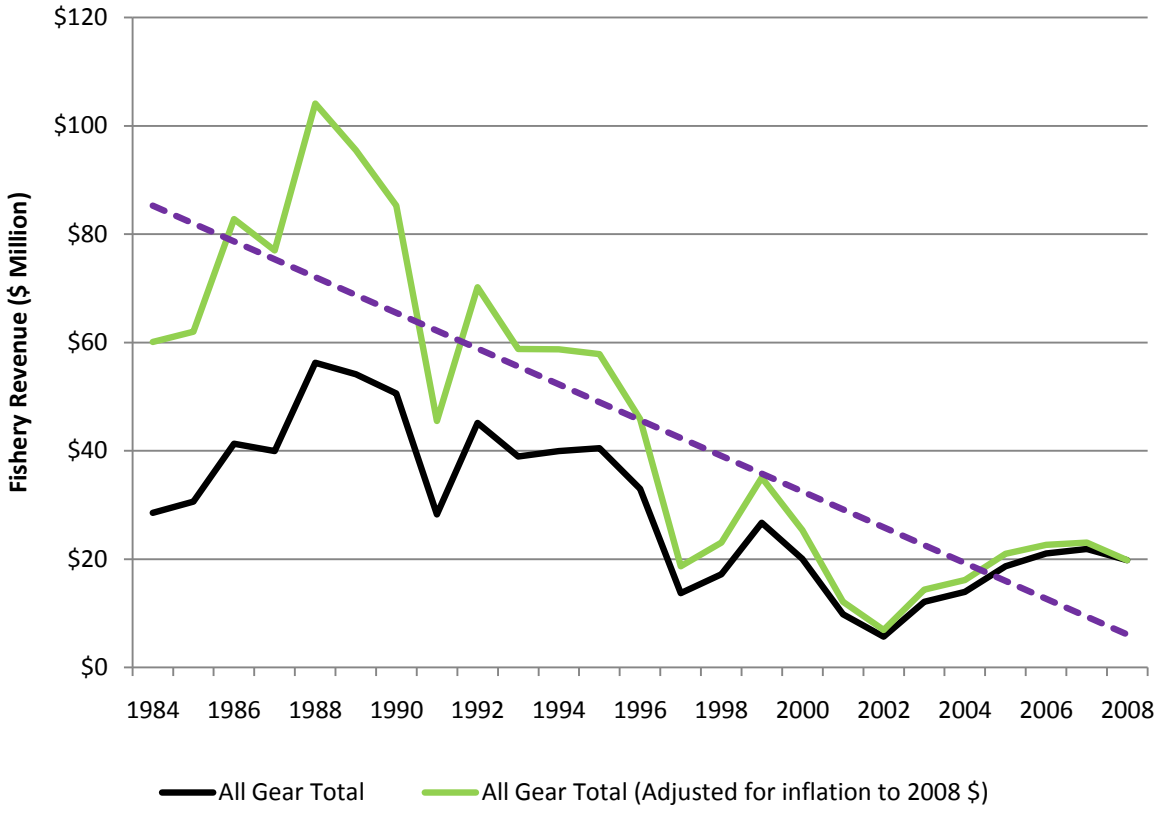


Sources: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008).

Here we adjust the combined set and drift revenues of all watershed residents for inflation. The inflation adjustment shifts revenues from previous years upward because a dollar in earlier years would buy more goods than it does now. After adjusting for inflation the downward trend in revenues from the watershed (as shown in the dashed blue line) is very apparent.

Sensitivity testing on some of the factors contributing to this decline indicates that approximately 30 percent of the decline is due to the out-migration of permits, and another 60 percent is due to the fact that ex-vessel prices have not kept up with inflation. The remaining 10 percent of the decline is not explained by the variables that we examined.

Figure ES-44. Inflation Adjusted Total Revenue from Harvesting of Watershed Permit Holders, 1984 – 2008



Sources: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and the US Bureau of Labor Statistics (US BLS, 1980 - 2008).

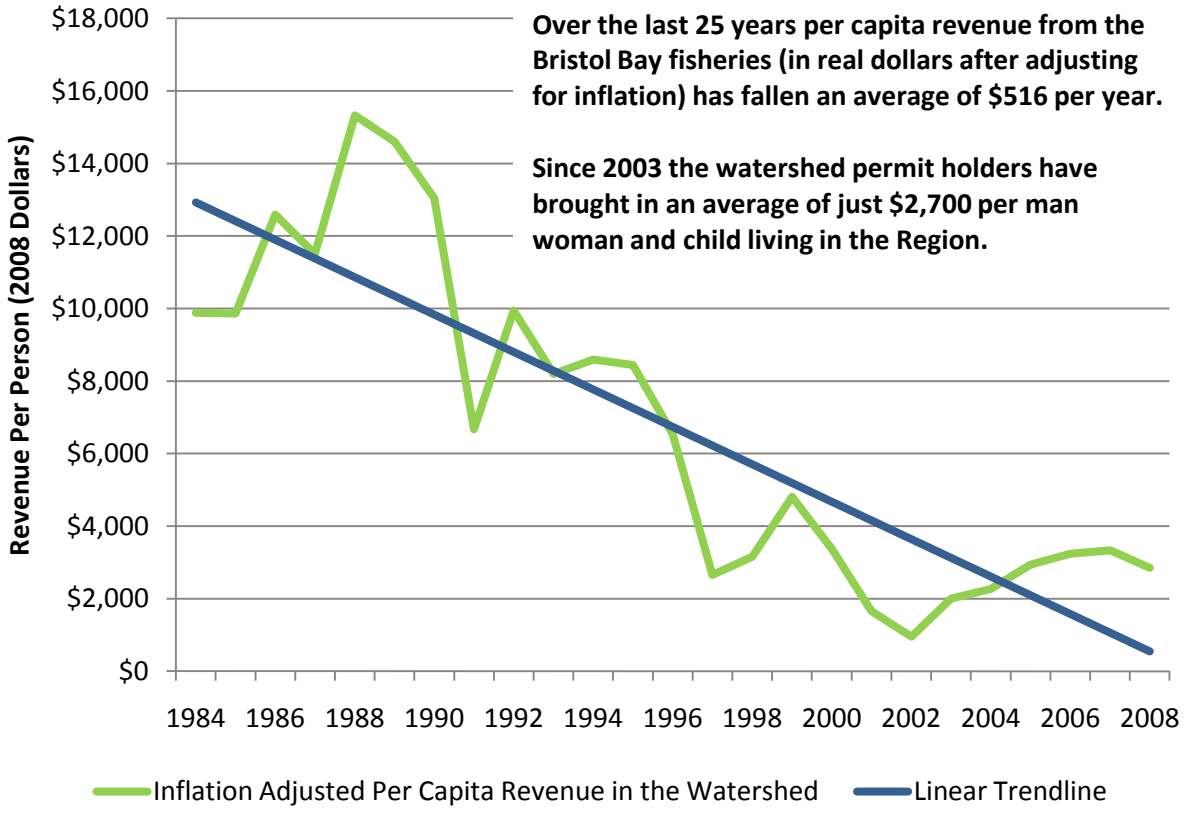
We conclude with the following statements and a final figure.

- The decline in value derived from the fishery by watershed residents has had a significant impact on the region's economy.
- The decline however does necessarily diminish the fishery's overall importance to residents.

The final figure shows the inflation adjusted per capita revenue from the Bristol Bay drift and set gillnet fisheries of permit holders residing in the Watershed. Since 1984, per capita revenues in the fishery have varied significantly with fishery-wide changes in run sizes and prices. But over the last 25 years per capita revenue from the Bristol Bay fisheries (in real dollars after adjusting for inflation) has fallen an average of $516 per year.

In the 1980's per capita revenue was over $10,000. However, since 2003 watershed permit holders have brought in an average of just $2,700 per man, woman, and child living in the Region.

Figure ES-45. Resident Bristol Bay Fishery Revenue per Capita, 1984 – 2008 (Adjusted for Inflation)



Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008), Commercial Fisheries Entry Commission (CFEC, 1980 - 2008), and the US Bureau of Labor Statistics (US BLS, 1980 - 2008).