1 Introduction and Overview

This main document 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

SUBMITTED BY CHRIS NAPOLI

The main document follows the some basic outline as in executive summary, but provides much greater detail with respect to sub-regions and communities within the larger Bristol Bay Region. Note that all of the figures included in the executive summary are also included in the main body of the document.

It should also be noted that in the main body of the document we discuss sub-regions of the Dillingham Census Area (DCA) and the Lake and Peninsula Borough (LPB). The Bristol Bay Borough is not subdivided.

The DCA is broken down into three sub-regions:

- **Dillingham Area** consisting of Dillingham, Aleknagik, Portage Creek, and Clark's Point
- **Togiak/Manokotak** consisting of Togiak, Twin Hills and Manokotak
- **Upper Nushagak** consisting of New Stuyahok, Koliganek, and Ekwok

The LPB is divided into three sub-regions:

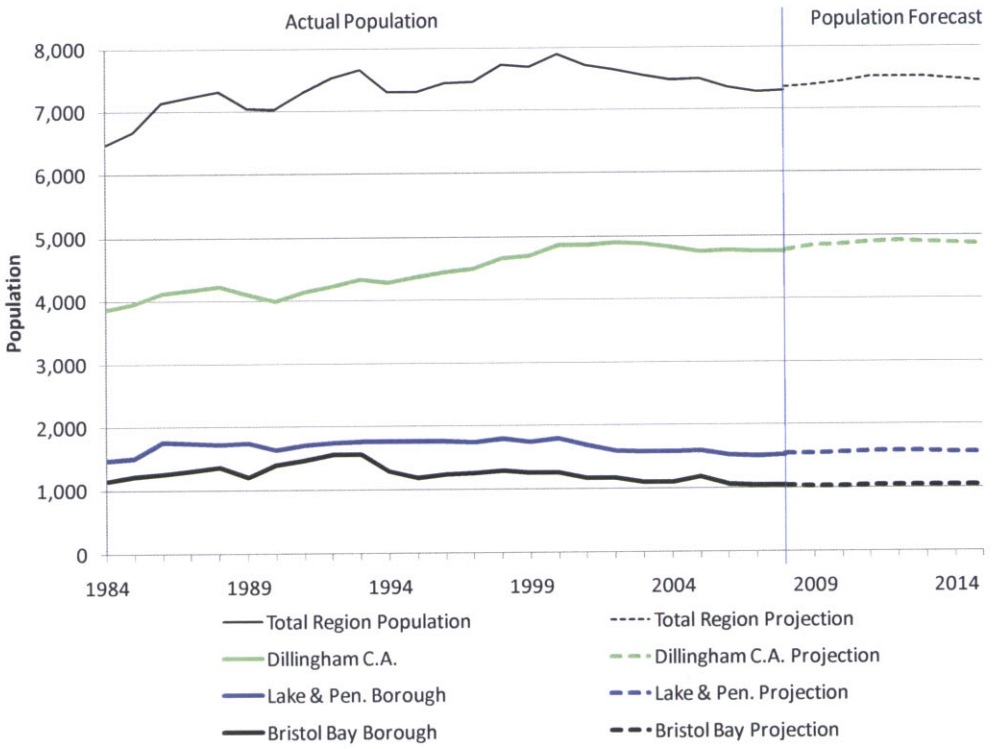
- **Lake Region** consisting of Newhalen, Nondalton, Kokhanok, Port Alsworth, Iliamna, Pedro Bay, Levelock, and Igiugig
- **Chignik Region** consisting of Perryville, Chignik Lake, Chignik City, Chignik Lagoon, Ivanof Bay
- **South Bay Region** consisting of Port Heiden, Pilot Point, Egegik and Ugashik

2 Population

In this section, we examine population trends in the Bristol Bay Region and provide forecasts of population out through 2015. The basis of our population forecasts is work conducted by Dr. Scott Goldsmith of the Unviserty of Alaska Anchorage's (UAA) Institute of Social and Economic Research (ISER). Dr. Goldsmith's forecasts were made for the Southwest Alaska Region, which includes Bristol Bay as well as the Kodiak Island Borough, the Aleutians East Borough, and the Aleutians West Census Area. Northern Economics took the large area forecast and broke it down to regions and communities using a series of ratios and trends within each Census Area, Borough, and community to ensure that all of the lower level forecasts sum up to forecasts for higher levels.

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.

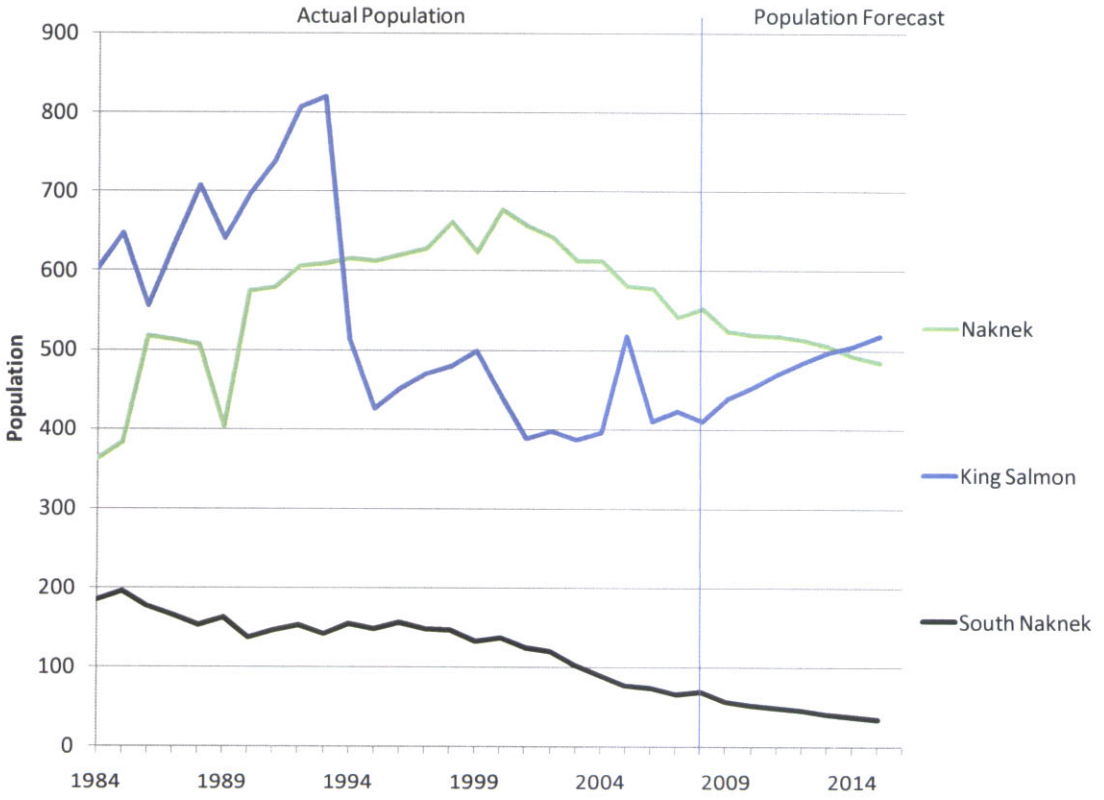
Figure 1. Population of the Bristol Bay Region 1984 – 2008 and Projections to 2014



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).

As shown in Figure 1, the population of the Bristol Bay Borough is slowly declining continuing a trend which began with the closing of the King Salmon Air Station in the mid-1990s.The closing of the base started the long aggregate decline in the BBB's population base. For the community of South Naknek, the decline in population began as early as 1984 and continues to this day (see Figure 2). The community of Naknek continued to grow until the end of the century (possibly as a result of in-migration from South Naknek), but has declined in size since then. Since the closing of the Air Station, the community of King Salmon has fluctuated between 400 and 500 residents.King Salmon is the only one of the three without a long-term declining population trend.

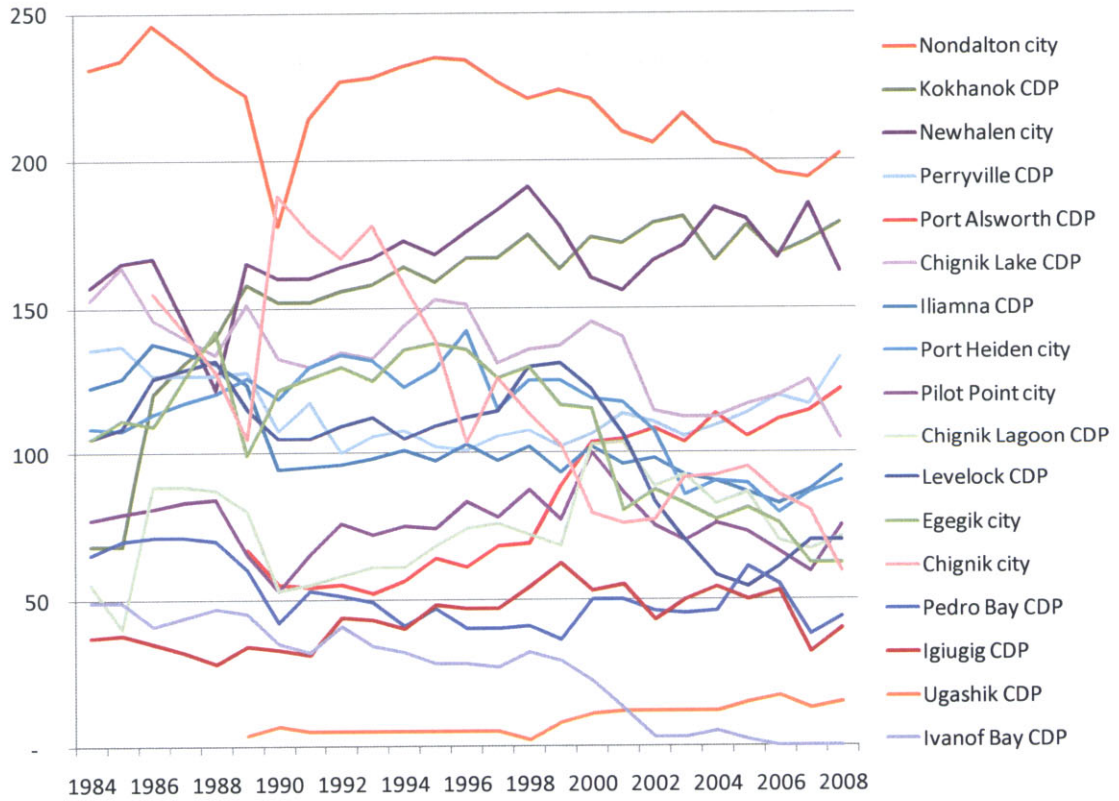
Figure 2. Populations of Communities in the Bristol Bay Borough 1980 – 2008 and Projections through 2014



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).

Figure 3 shows the populations of the 17 individual communities or Census Designated Places (CDPs) that the Lake and Peninsula Borough comprises. Each community shows a unique pattern. Some of the communities with long-term population increases include Kokhanok and Port Alsworth, while long-term declines are noticeable in Nondalton, Chignik City, Egegik, and Ivanof Bay. As noted in Figure 1, the long-term aggregate trend is for decreasing population.

Figure 3. Populations of Individual Communities in the Lake and Peninsula Borough 1984 – 2008



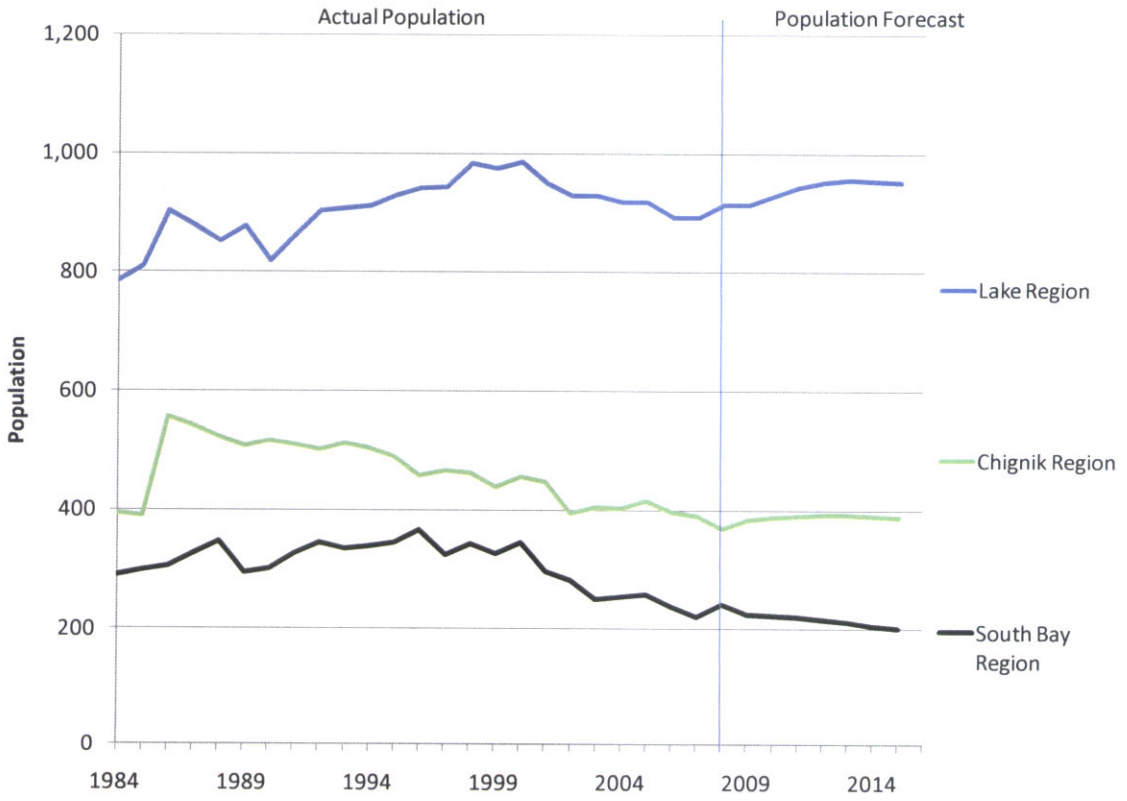
Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008).

When the LPB is divided into three sub-regions, the data show that the population in the Lake Region is stable while populations in the Chignik Region and the South Bay Region are falling. The regions comprise the following communities:

- **Lake Region:** Newhalen, Nondalton, Kokhanok, Port Alsworth, Iliamna, Pedro Bay, Levelock, and Igiugig
- **Chignik Region:** Perryville, Chignik Lake, Chignik City, Chignik Lagoon, Ivanof Bay
- **South Bay Region:** Port Heiden, Pilot Point, Egegik and Ugashik

The following figures show trends for individual communities in each region.

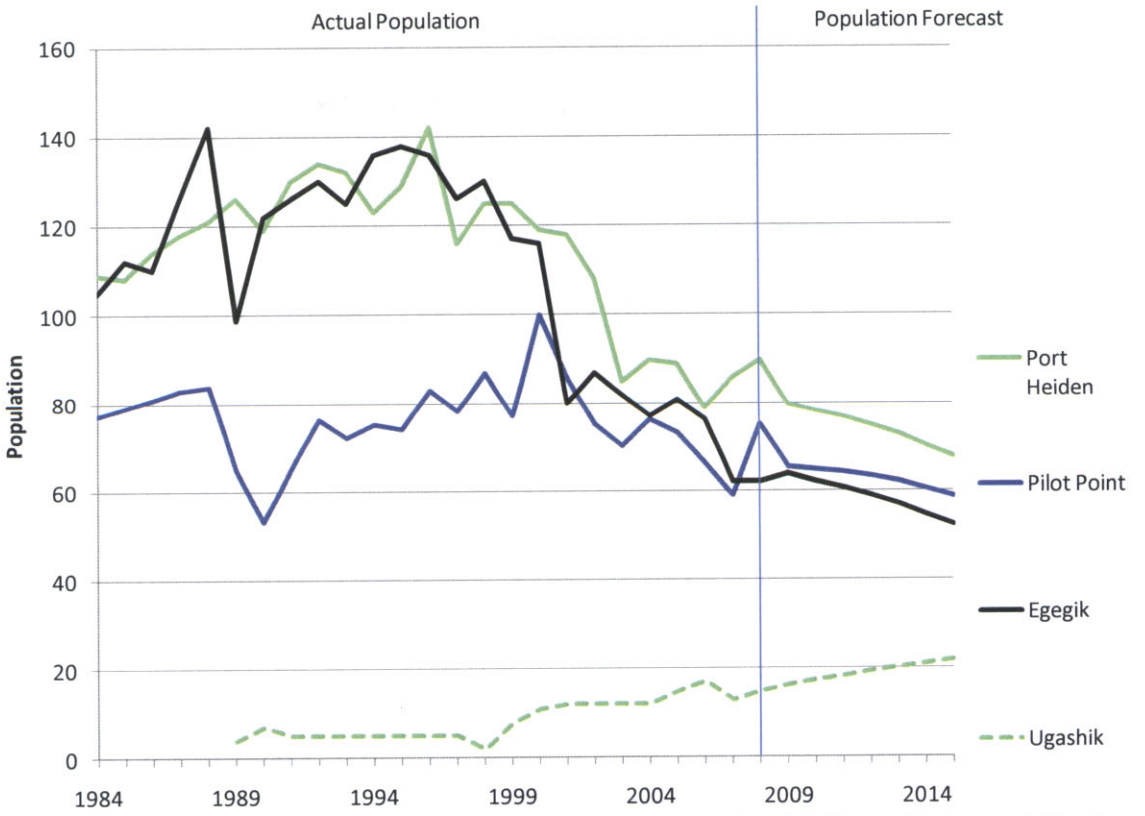
Figure 4. Lake & Peninsula Sub-Regions—Actual Population & Forecasts 1984 – 2014



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).

Three of the four communities within the South Bristol Bay Region of the LPB experienced significant population declines starting in the mid to late-1990s.Port Heiden, Pilot Point, and Egegik have all experienced substantial population decreases, with Port Heiden's and Pilot Point's populations falling by nearly 50 percent. Conversely, the community of Ugashik has experienced slowly increasing population levels, but it still a community of fewer than 20 residents.

Figure 5. Lake & Peninsula Communities in South Bristol Bay Region—Actual Population & Forecasts 1984 – 2014

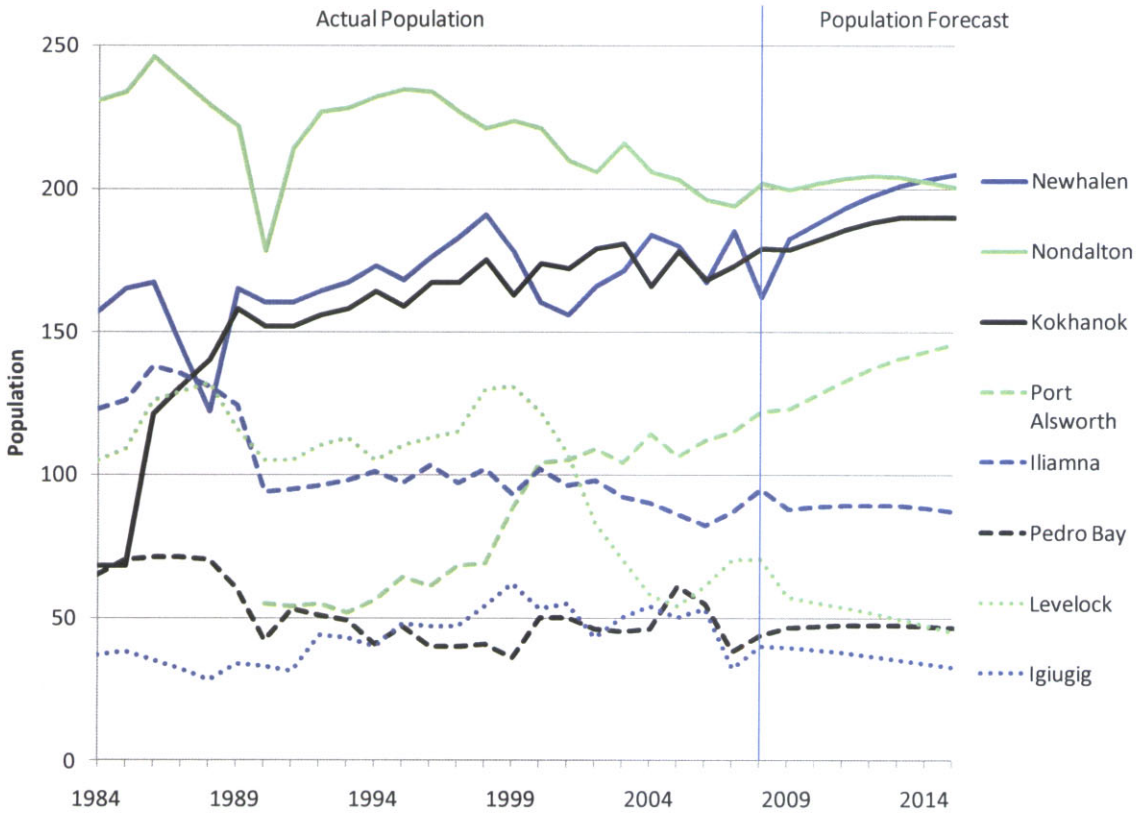


Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008) and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

The eight communities in the Lake Region of the LPB show a number of different trends:

- Nondalton, Levelock, and to a lesser degree Iliamna show declining population numbers.
- Newhalen, Kokhanok, and Port Alsworth exhibit long-term increasing trends.
- Population counts in Pedro Bay and Igiugig are generally stable.

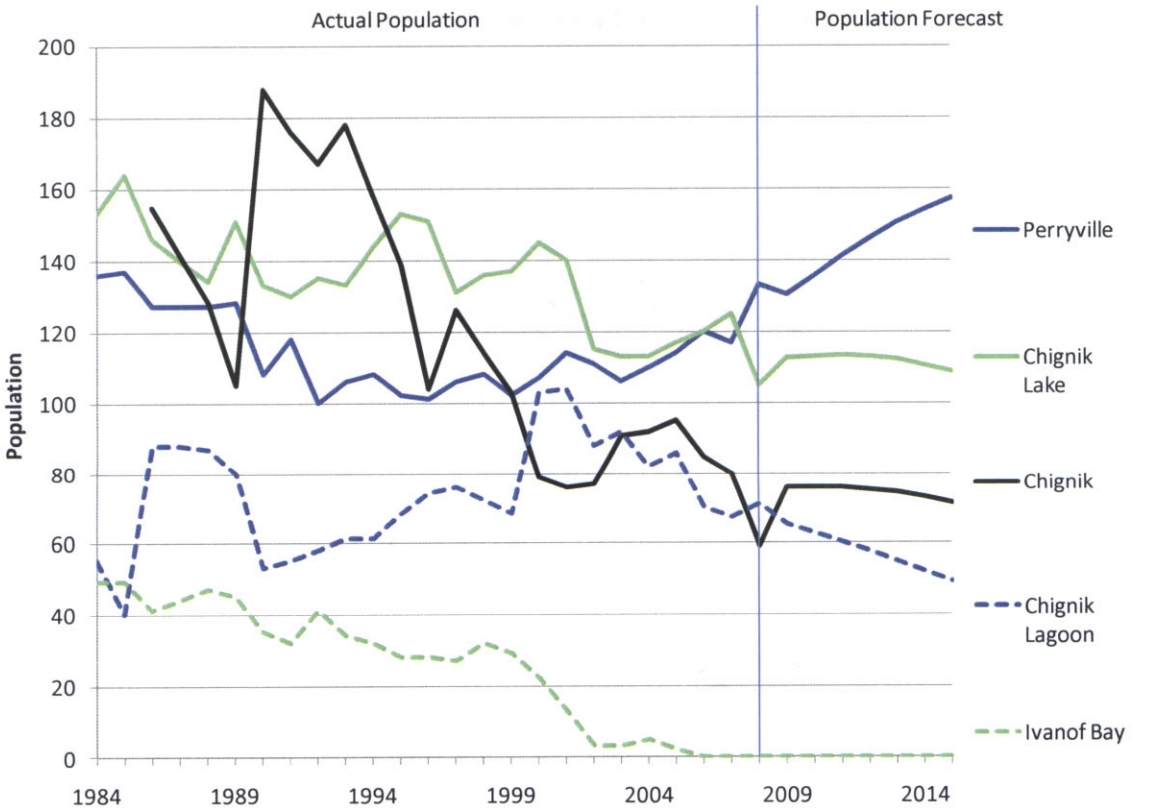
Figure 6. Lake & Peninsula Communities in the Lake Region—Actual Population & Forecasts 1984 – 2014



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).

With the exception of Perryville, the five communities in the Chignik region have all experienced long-term or medium term population declines. Of the remaining four communities, populations for all but Chignik Lagoon are smaller now than they were in 1984. The population of Perryville is roughly 10 percent higher than it was in 1984 and roughly 40 percent higher than it was in 1994.

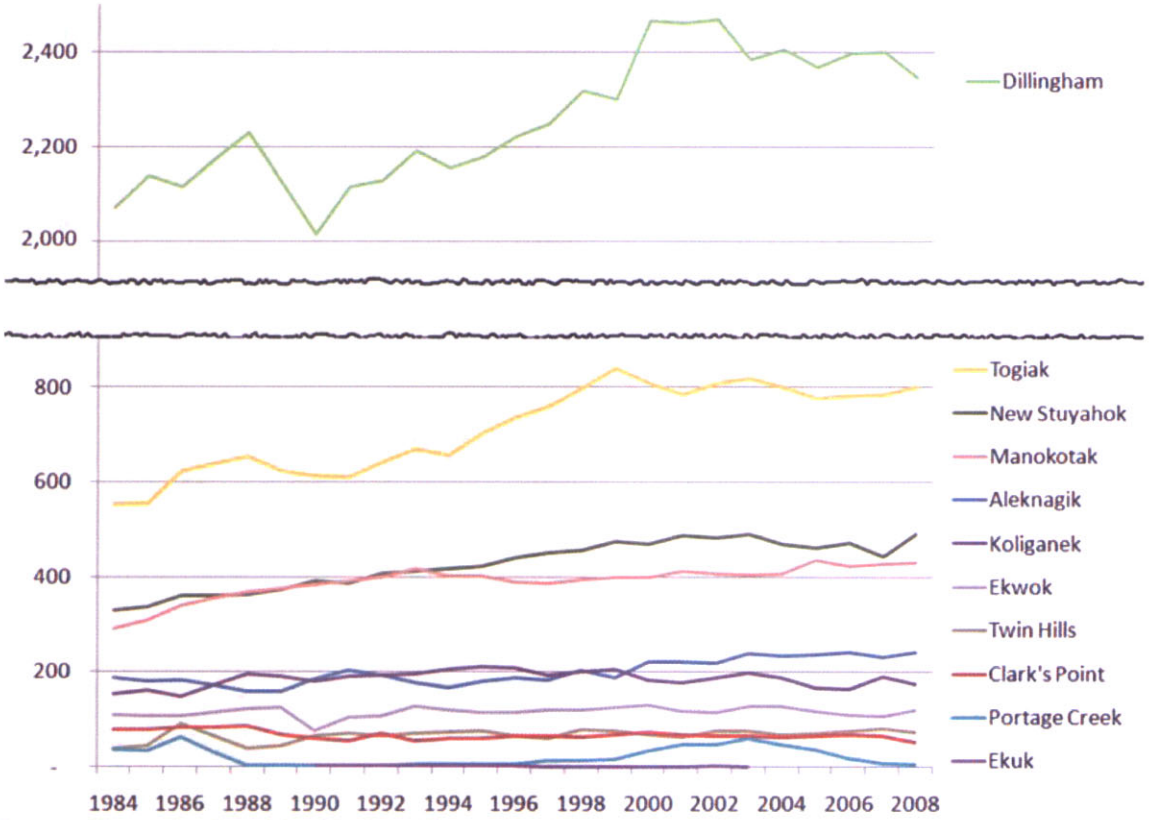
Figure 7. Lake & Peninsula Communities in the Chignik Region—Actual Population & Forecasts 1984 – 2014



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).

Populations in the DCA are dominated by Dillingham itself. The next largest of the ten remaining communities in the area is roughly one-third the size of Dillingham.The most interesting thing about the populations of the communities in the DCA are how stable they are compared to other communities in different sub-regions of Bristol Bay.With the possible exception of Portage Creek and Ekuk, it's difficult to find a community with a long-term declining population trend. The following figures show trends for individual communities in each region in the DCA.

Figure 8. Populations by Community in the Dillingham Census Area, 1984 - 2008



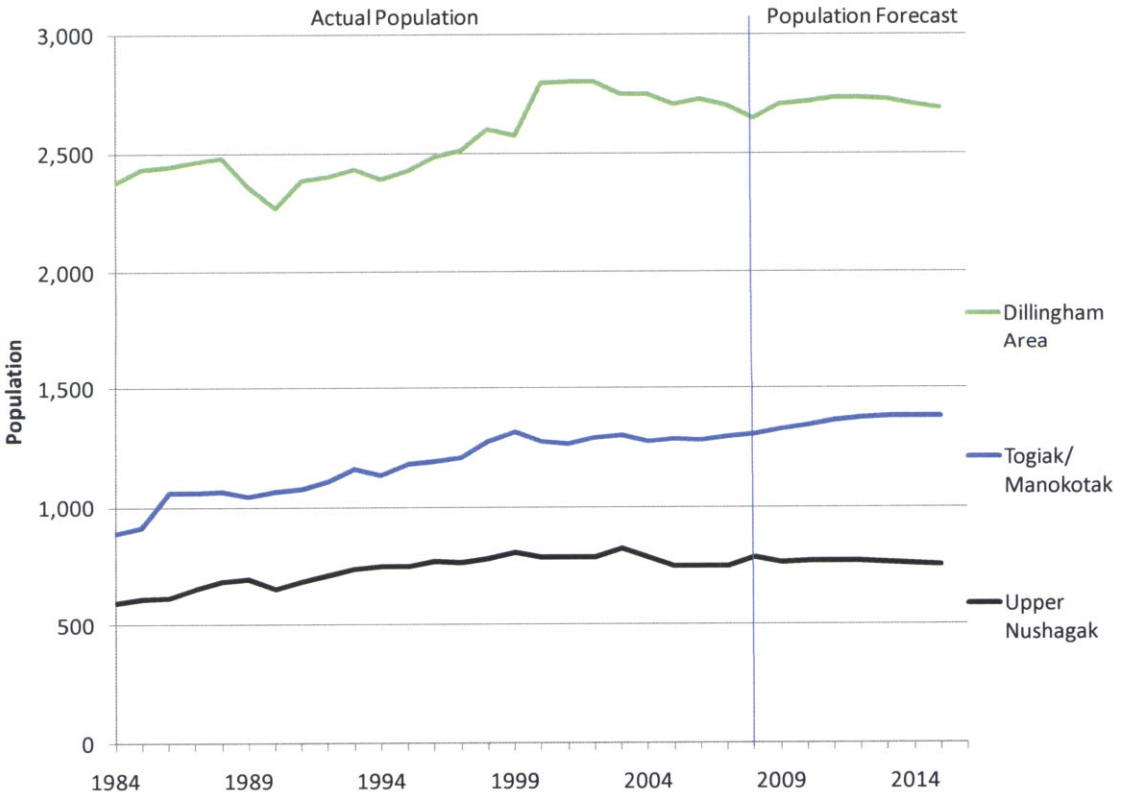
Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008).

The DCA is broken down into three sub-region as follows:

- Dillingham Area consisting of Dillingham, Aleknagik, Portage Creek, and Clark's Point
- Togiak/Manokotak consisting of Togiak, Twin Hills and Manokotak
- Upper Nushagak consisting of New Stuyahok, Koliganek, and Ekwok

All of the sub-regions in the DCA show population growth trends or, in the case of the Upper Nushagak, population stability.

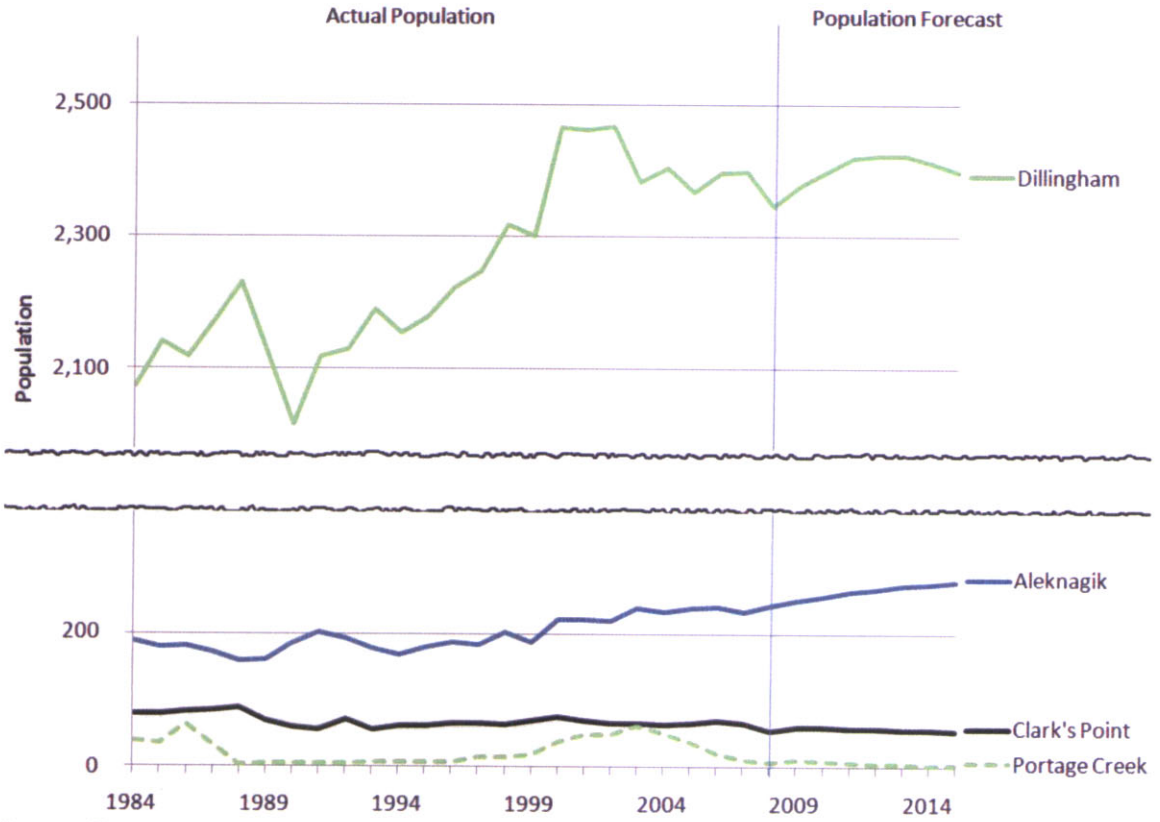
Figure 9. Dillingham Census Area Sub-Regions—Actual Population & Forecasts 1984 – 2014



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).

In the Dillingham Sub-Region, the community of Aleknagik has shown slow, but steady growth over the last decade while Clark's Point and has shown a slight decline and Portage Creek's population has fluctuated.

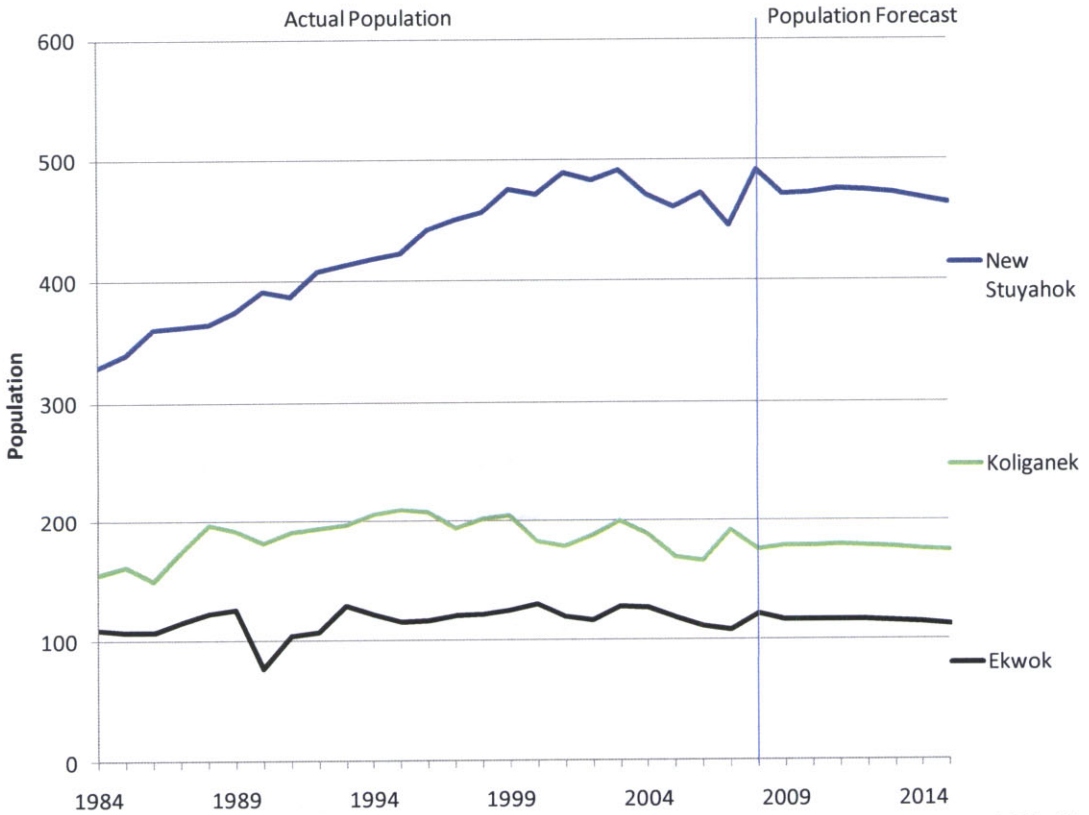
Figure 10. Dillingham Sub-Region—Actual Population & Forecasts 1984 – 2014



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).

In the Upper Nushagak Sub-Region, New Stuyahok's population has recently leveled out after a period of sustained growth while Koliganek and Ekwok have population trends that are largely flat with slight recent declines.

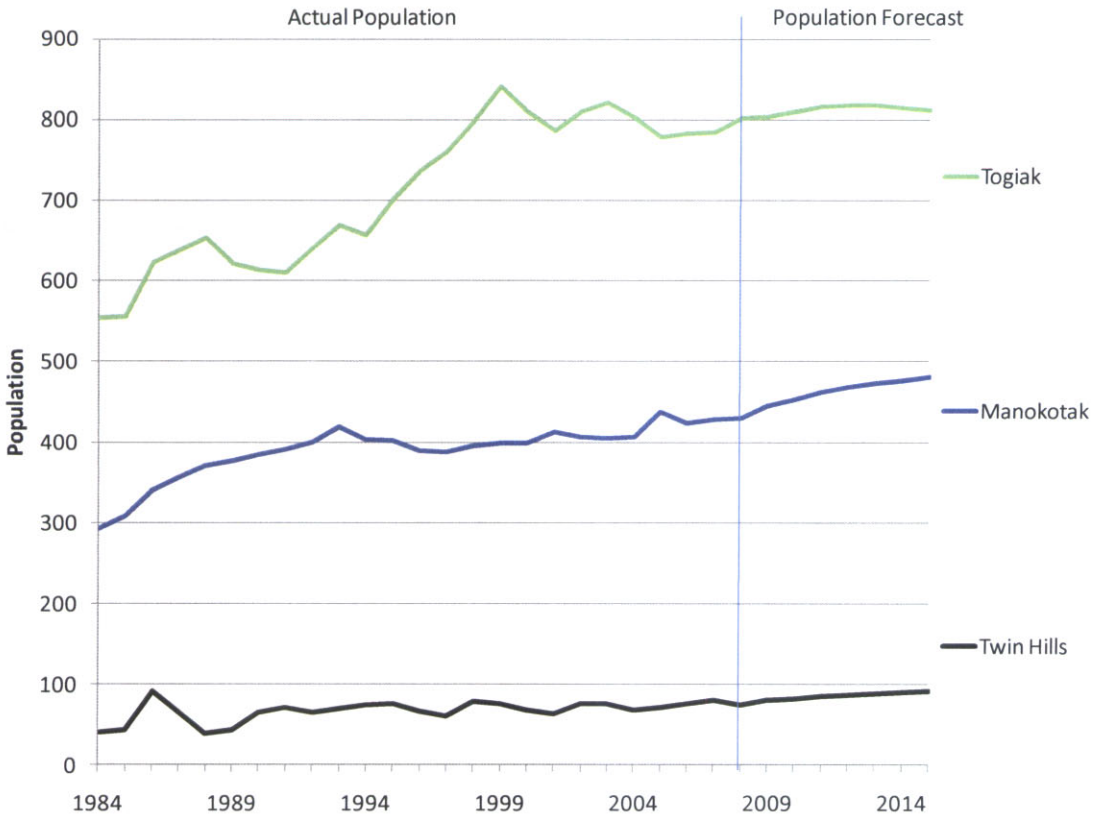
Figure 11. Upper Nushagak Sub-Region—Actual Population & Forecasts 1984 – 2014



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).

Togiak, Manokotak, and Twin Hills all exhibit long-term growth trends which have moderated somewhat in recent years.

Figure 12. Togiak/Manokotak Sub-Region—Actual Population & Forecasts 1984 – 2014



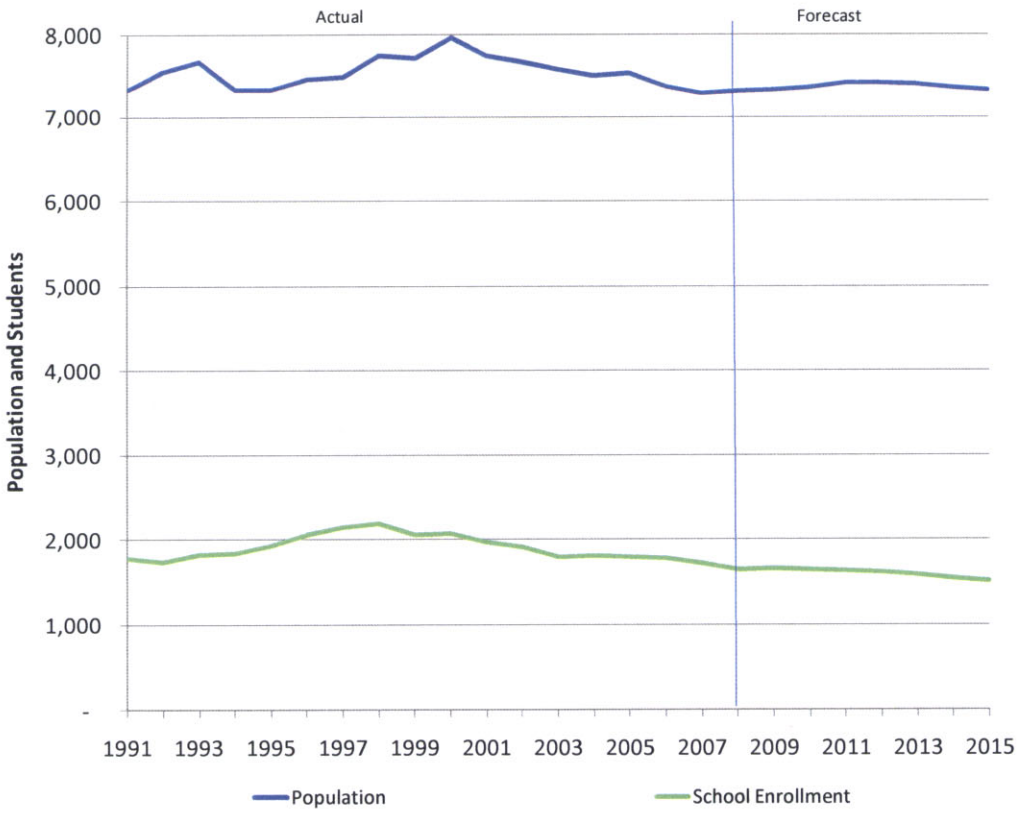
Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008) and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

3 School Enrollments in the Bristol Bay Region

This section examines historical school enrollments in the Bristol Bay region and forecasts future enrollments. The primary source of data is the State of Alaska, Department of Education and Early Development, which publishes school enrollment statistics. Annual school enrollment data for individual schools are provided for the school years 1995-1996 up to 2008-2009. Enrollment forecasts are based on the population forecasts generated in the previous section and historical ratios of enrollments to population on a community-by-community basis.

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.

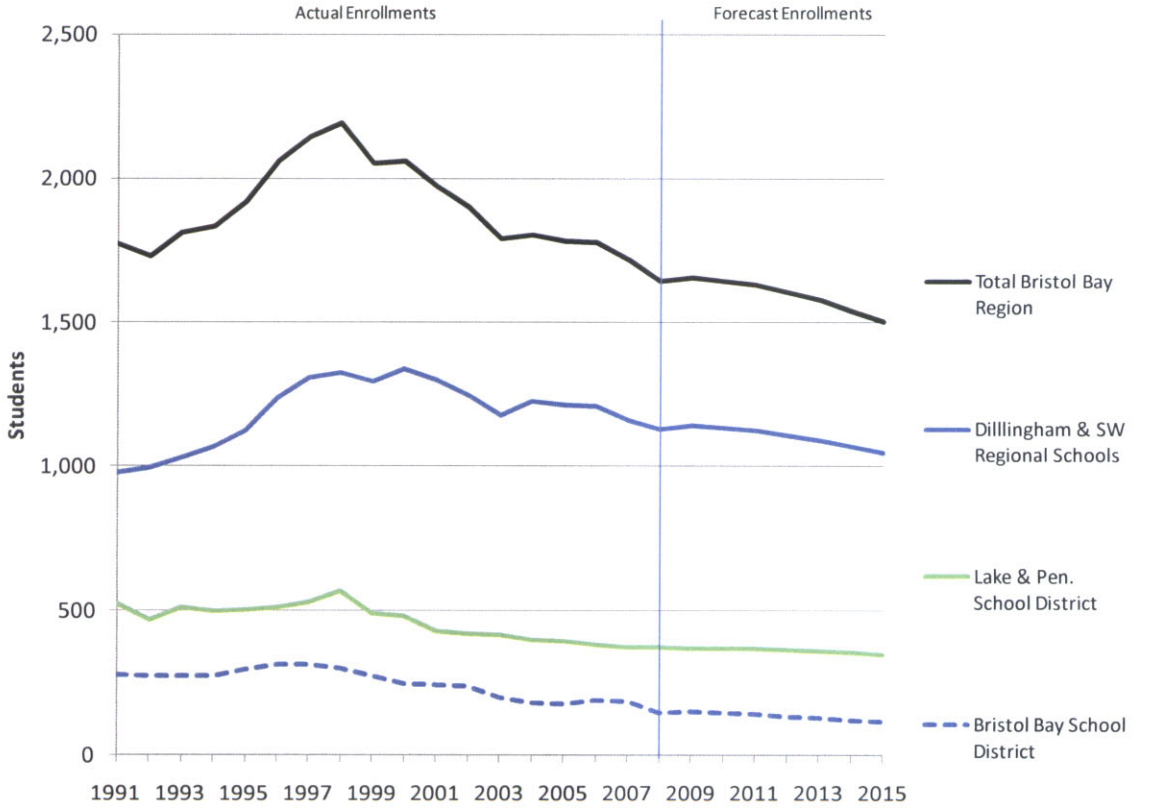
Figure 13. Actual and Forecast Population & School Enrollments in the Bristol Bay Region, 1991 - 2015



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.

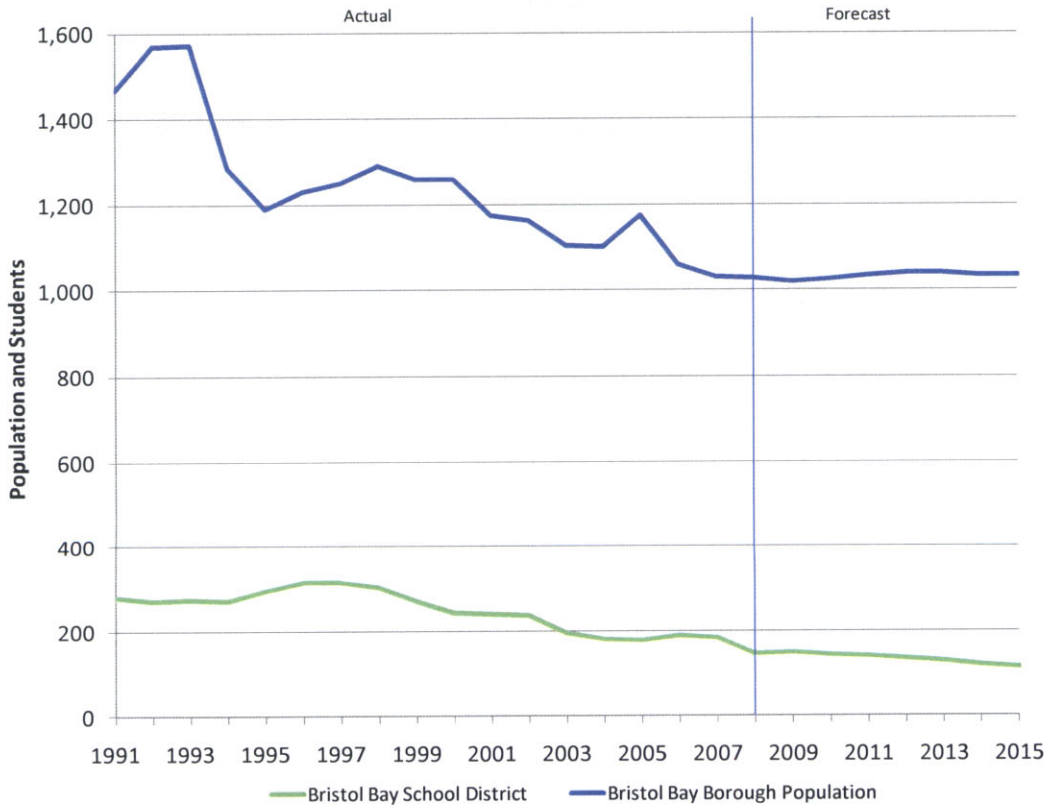
Figure 14. School Enrollments & Forecasts for the Bristol Bay Region by Borough & Census Area, 1991 – 2015



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).

Figure 15 shows how declining school enrollment in the Bristol Bay Borough follows long-term declines in population numbers.

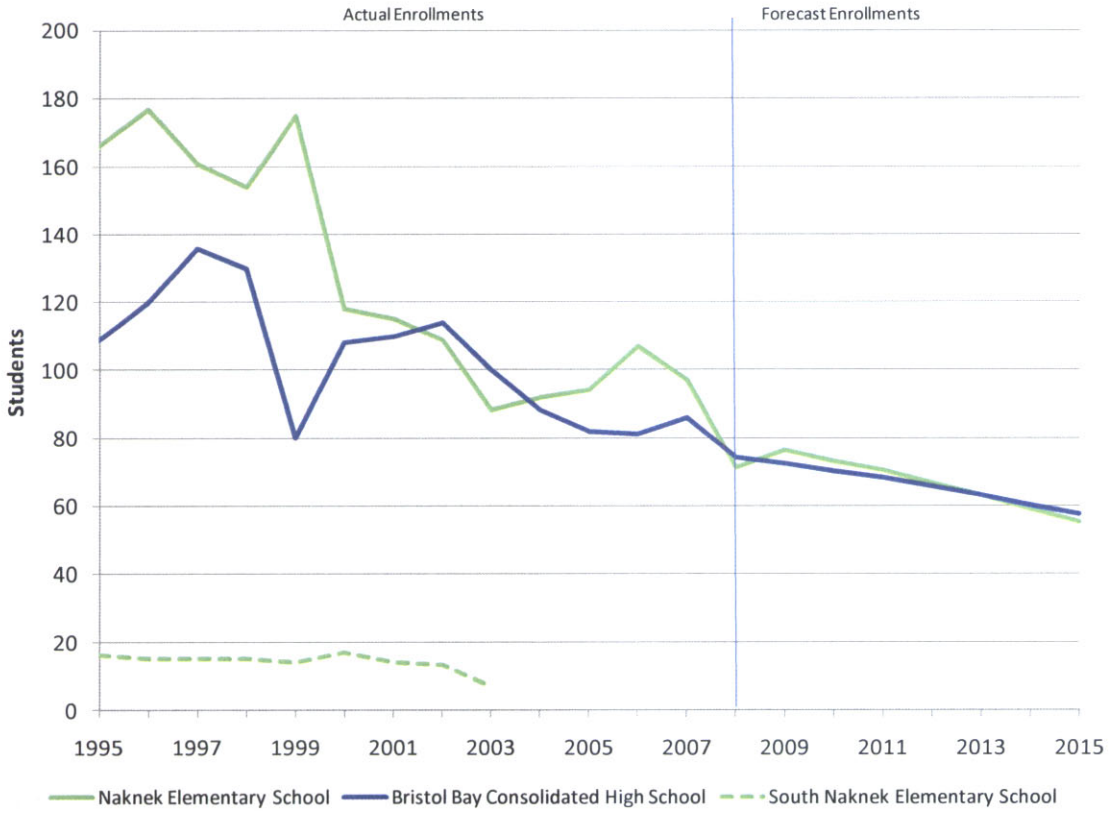
Figure 15. Actual and Forecast Population and School Enrollments in the Bristol Bay Borough, 1991 - 2015



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 Naknek Elementary School lost nearly 50 percent of its enrollment between 1995 and 2008, while enrollment at the Bristol Bay Consolidated High School has fallen by roughly 30 percent. The figure also shows the closing of the South Naknek Elementary School and the subsequent short-term enrollment increase at the Naknek Elementary School.

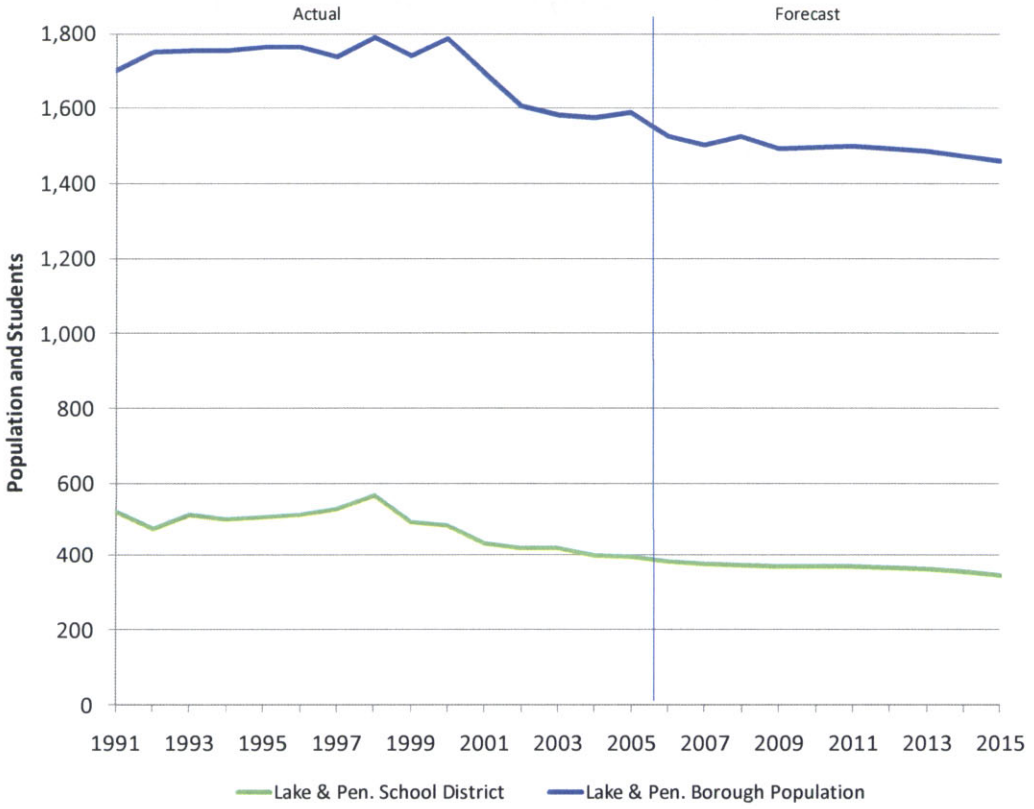
Figure 16. Actual and Forecast Enrollments by School in Bristol Bay School District, 1995 – 2015



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).

As with the BBB, school enrollments in the LPB have roughly tracked trends in overall population. Both population and school enrollment are forecast to continuing declining, albeit at a slower rate than seen from 2000 to 2008 (see Figure 17).

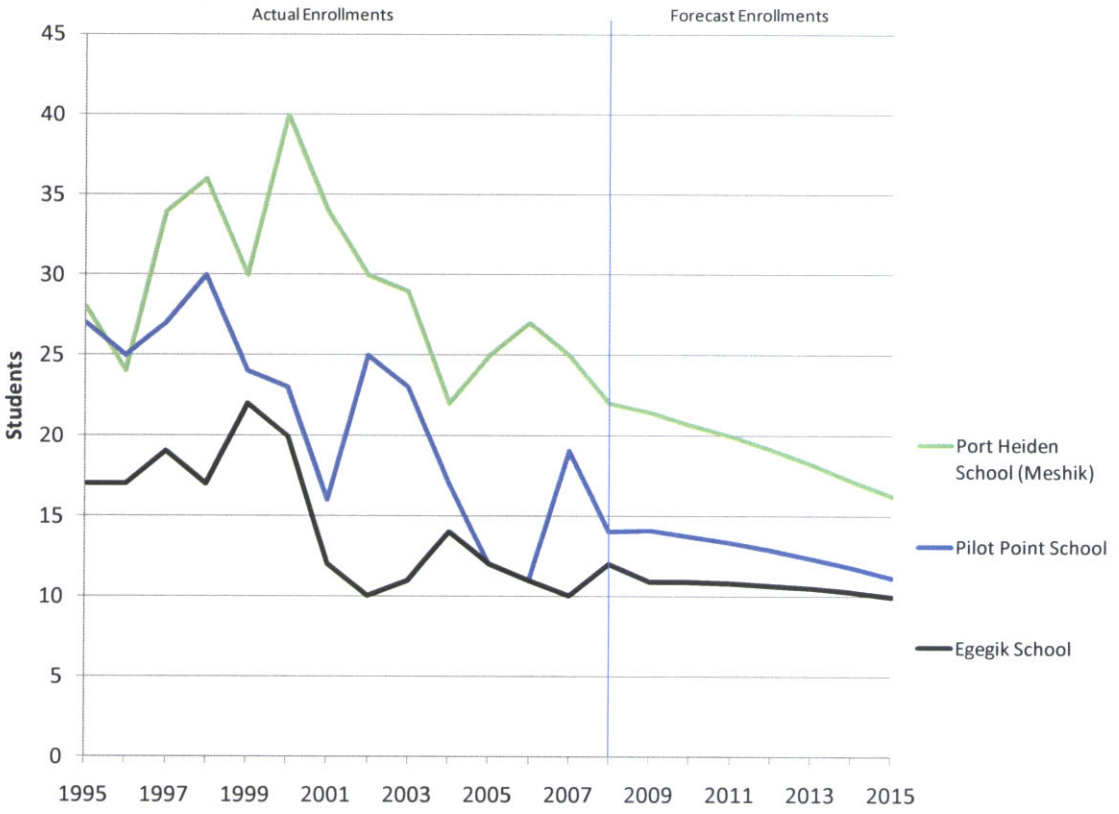
Figure 17. Actual and Forecast Population and School Enrollments in the Lake & Pen. Borough, 1991 - 2015



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).

Enrollments at the Port Heiden School, Pilot Point School, and Egegik School in the South Bristol Bay sub-region all follow the same long-term pattern, but with differing year-to-year variations. The difference in year-to-year variations may be caused by certain age groups leaving the schools or by transfers between schools.

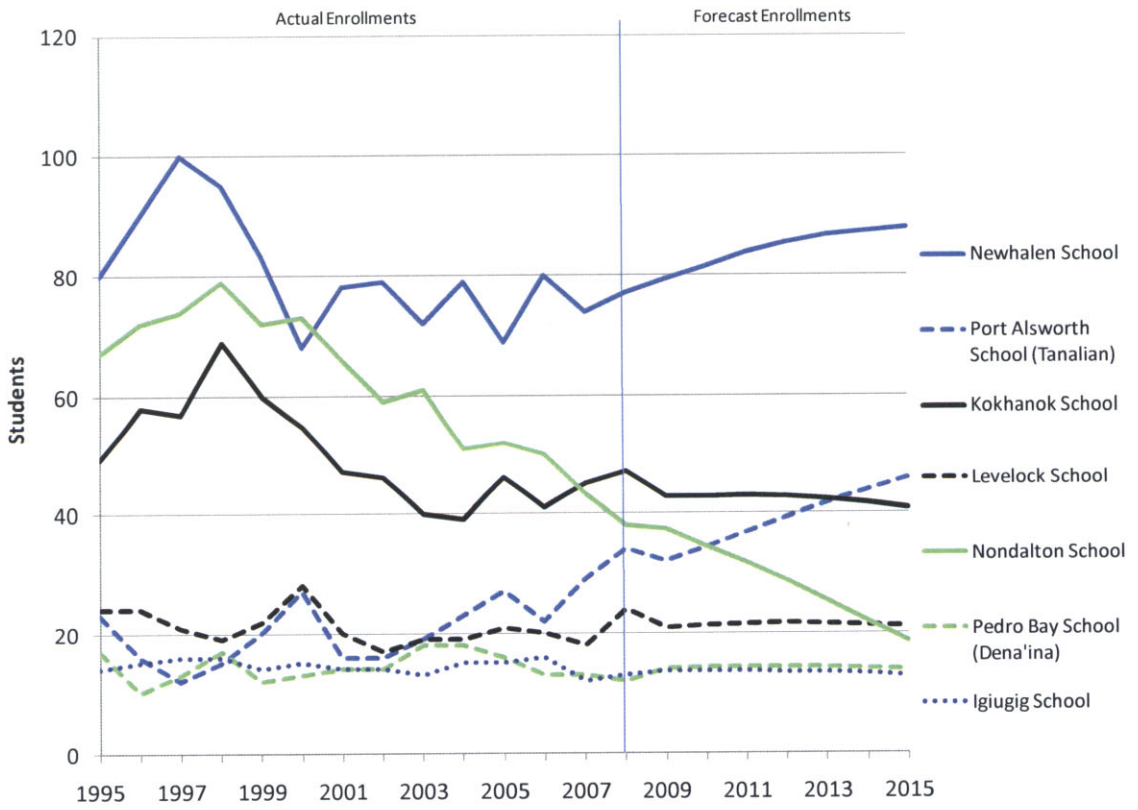
Figure 18. Actual and Forecast Enrollments in the South Bristol Bay Area, 1995 – 2015



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).

Enrollment at many of the schools in the Lake Area sub-region of the LPB have stabilized since declining in the late 1990s, and some schools are showing increasing enrollment, which follows population trend patterns in the area. In particular, the Port Alsworth School has shown increased growth in recent years. On the other hand, the Nondalton School has experienced a long-term declining enrollment trend (see Figure 19).

Figure 19. Actual and Forecast Enrollments in the Lake Area, 1995 – 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).

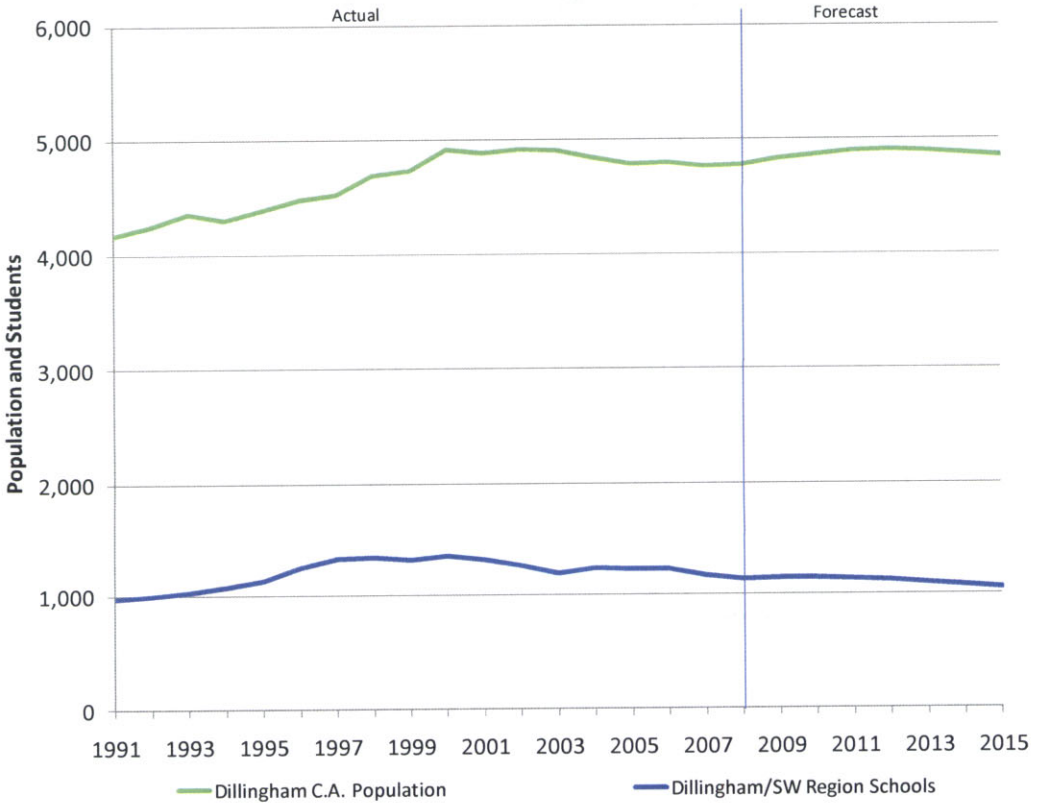
Enrollments in the Chignik Area of the LPB are universally lower. However, the Perryville School has seen the smallest declines, which match its comparatively stronger population trends. Enrollment at the Chignik Bay School has stabilized in recent years, but still remains just barely above ten students—the State of Alaska minimum to receive funding.

Figure 20. Actual and Forecast Enrollments in the Chignik Area, 1995 – 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).

Enrollments in the school districts contained in the Dillingham Census Area have declined since their peaks in the late-1990s, but are stable compared to other school districts in the project area. We expect generally stable enrollment levels in the future.

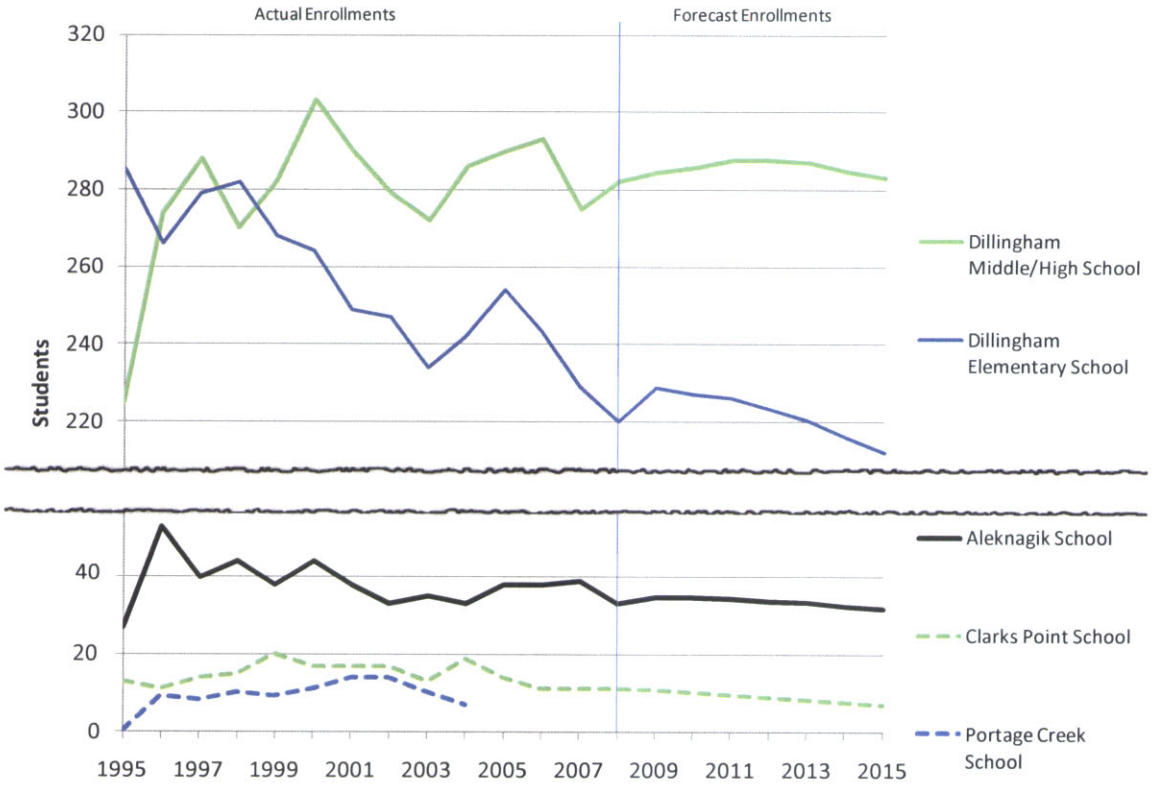
Figure 21. Actual and Forecast Population and School Enrollments in Dillingham Census Area, 1991 - 2015



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).

The overall stability of the Dillingham School District belies the fact that enrollment in the Dillingham Elementary School has declined roughly 25 percent between 1995 and 2008. In comparison, the enrollment at the middle and high school level is roughly constant as is enrollment at the area's smaller schools such as the Aleknagik School and the Clarks Point School. The Portage Creek School no longer exists as it fell below the minimum number of students to receive state funding.

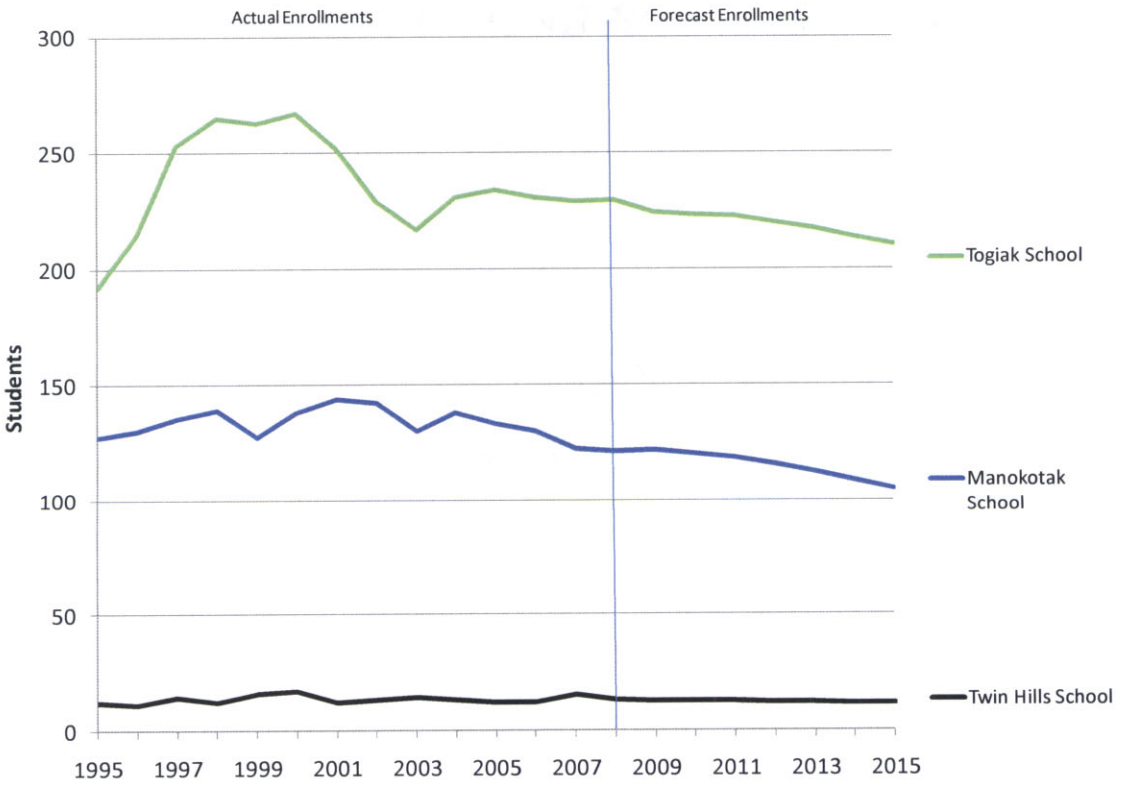
Figure 22. Actual and Forecast Enrollments in the Dillingham Area, 1995 – 2015



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).

In the Togiak and Manokotak Area, enrollment is stable at the Togiak and Twin Hill Schools, but is declining at the Manokotak School. This latter trend is somewhat surprising given the stability of the population in Manokotak itself, and is likely related to an aging population.

Figure 23. Actual and Forecast Enrollments in the Togiak/Manokotak Area, 1995 – 2015

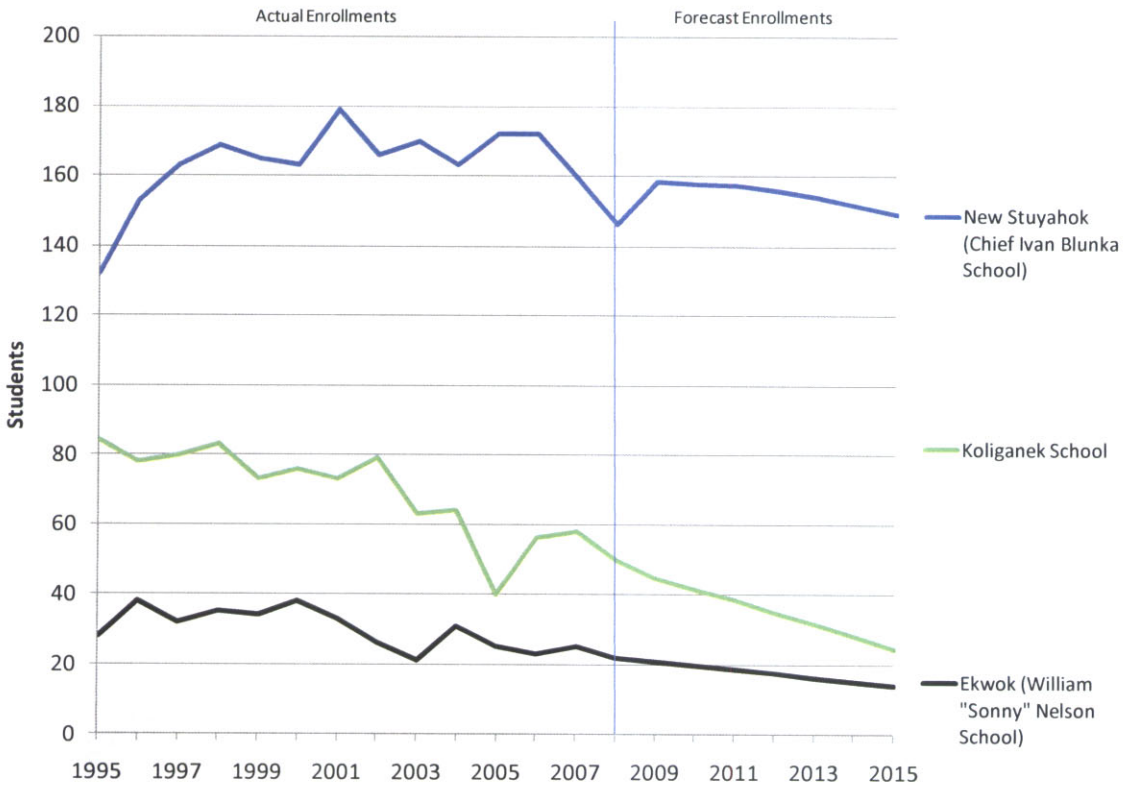


Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008), AK Dept. of Educatioin and Early Development (ADEED, 1991 - 2008), and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

In the Upper Nushagak area of the DCA:

- Enrollment is relatively steady in New Stuyahok despite a recent multi-year dip.
- Enrollment has declined in Koliganek, but has partially recovered in recent years.
- Enrollment in Ekwok shows year-to-year variations but a long-term declining trend.

Figure 24. Actual and Forecast Enrollments in the Upper Nushagak Area, 1995 – 2015



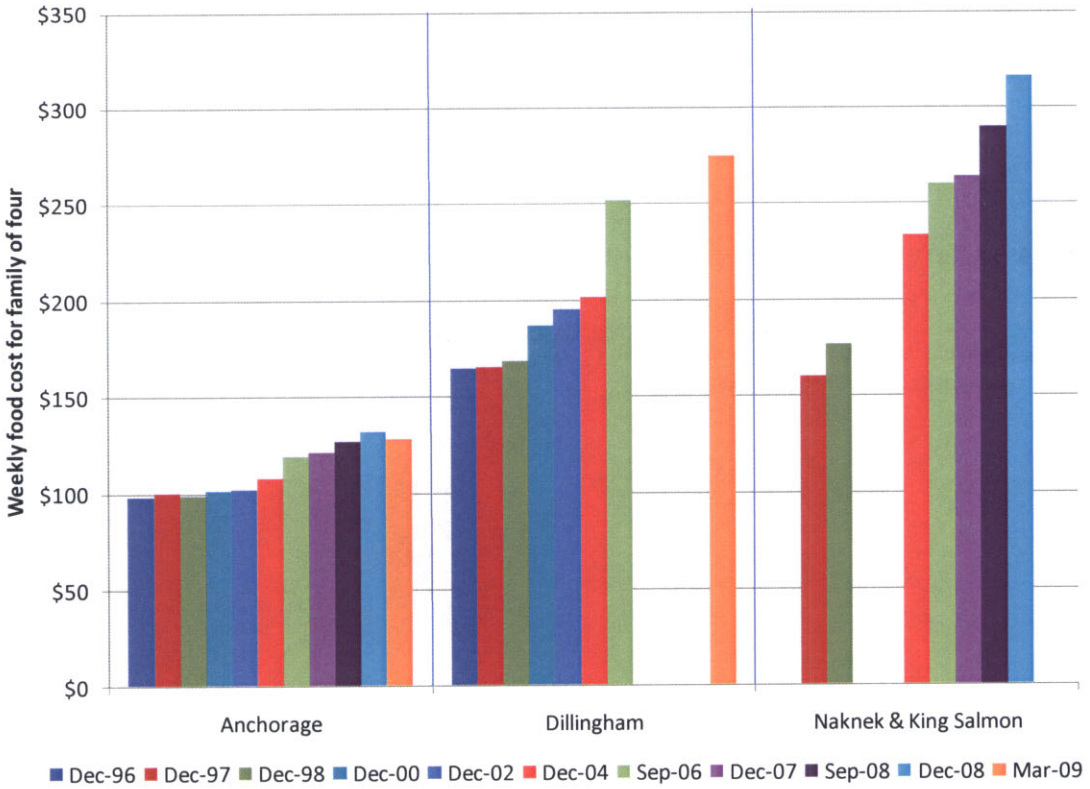
Source: Figure developed by Northern Economics based on data from AK Dept of Labor and Workforce Development (ADOLWD, 1990 - 2008), AK Dept. of Educatioin and Early Development (ADEED, 1991 - 2008), and Dr. Scott Goldsmith of ISER (Goldsmith, 2009).

4 The Cost of Living in the Bristol Bay Region

This section examines the cost of living in the Bristol Bay Region and makes comparisons to the cost of living in Anchorage. In general, data regarding the cost of living in rural area of Alaska is sporadic and difficult to use and interpret. 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 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 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.

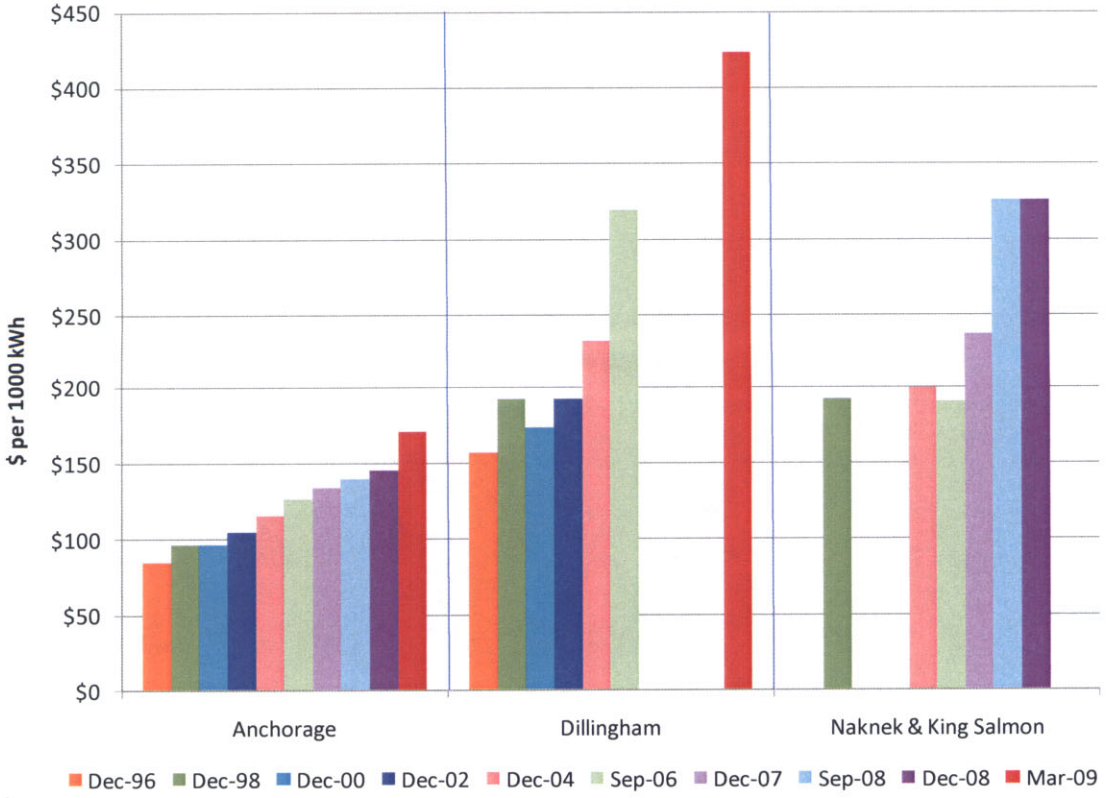
Figure 25. Comparison of Family Food Costs in Anchorage Dillingham and Naknek/King Salmon, 1996 - 2009



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.

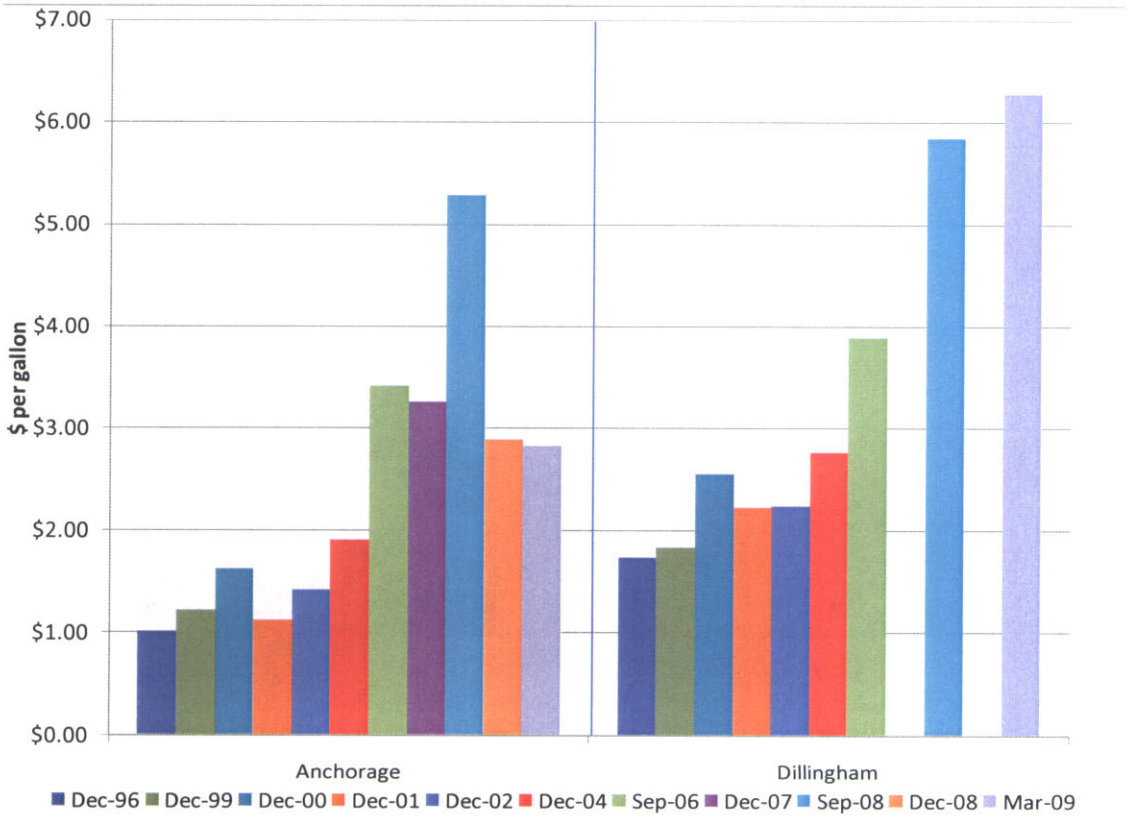
Figure 26. Comparison of Electricity Costs in Anchorage Dillingham and Naknek/King Salmon, 1996 - 2009



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

This figure compares the costs of home heating fuel in Anchorage and Dillingham. In general, home heating fuel prices in Dillingham have historically been roughly $0.70 higher than in Anchorage. This difference is undoubtedly due to the additional costs of transporting fuel to Dillingham. The difference was about the same even with the large spike in fuel prices in September 2008. However, since then prices in Anchorage have come back down, while the price of heating fuel in Dillingham remained high in March 2009 and was over $3.00 greater than Anchorage prices. The difference is most likely due to fuel delivery schedules, and the inability of Dillingham to quickly take advantage of major price swings.

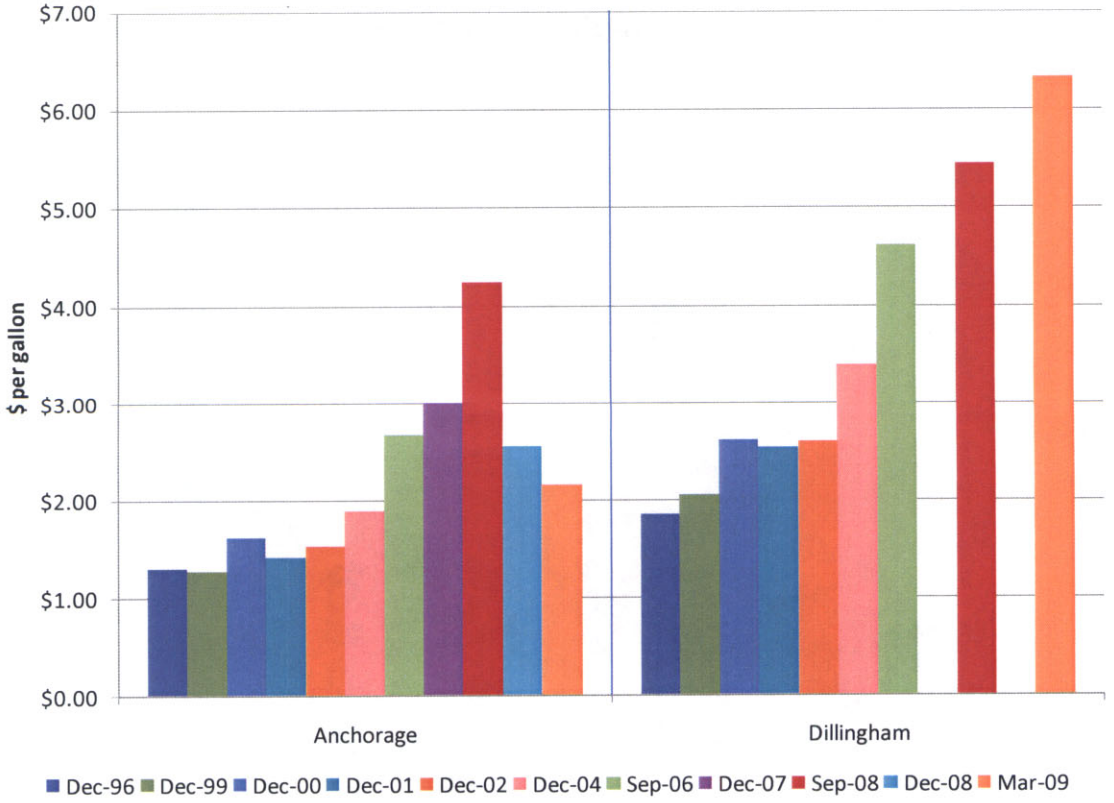
Figure 27.Comparison of Home Heating Fuel Prices in Anchorage and Dillingham 1996 - 2009



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 and home heating fuel, the cost of gasoline has risen more quickly in Dillingham than it has in Anchorage (see Figure 28 and Figure 27). More important, the price of fuel has stayed up from prior levels, while the price of fuel in Anchorage has come back down to prior levels. This increase results from the fact that fuel must be barged to Dillingham and the community is reachable only by airplane during the winter. Thus, the prevailing fuel price when the last barge arrives often sets the price until the following spring.

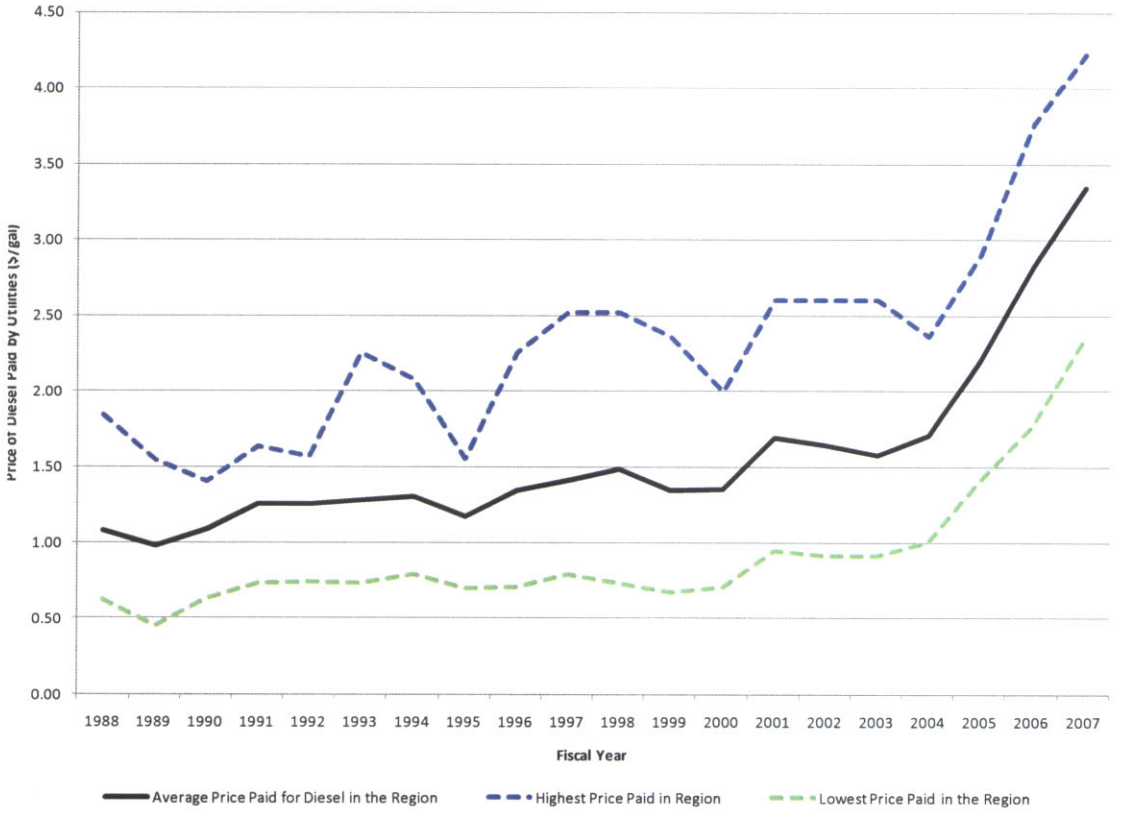
Figure 28. Comparison of Gasoline Prices in Anchorage and Dillingham 1996 - 2009



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.

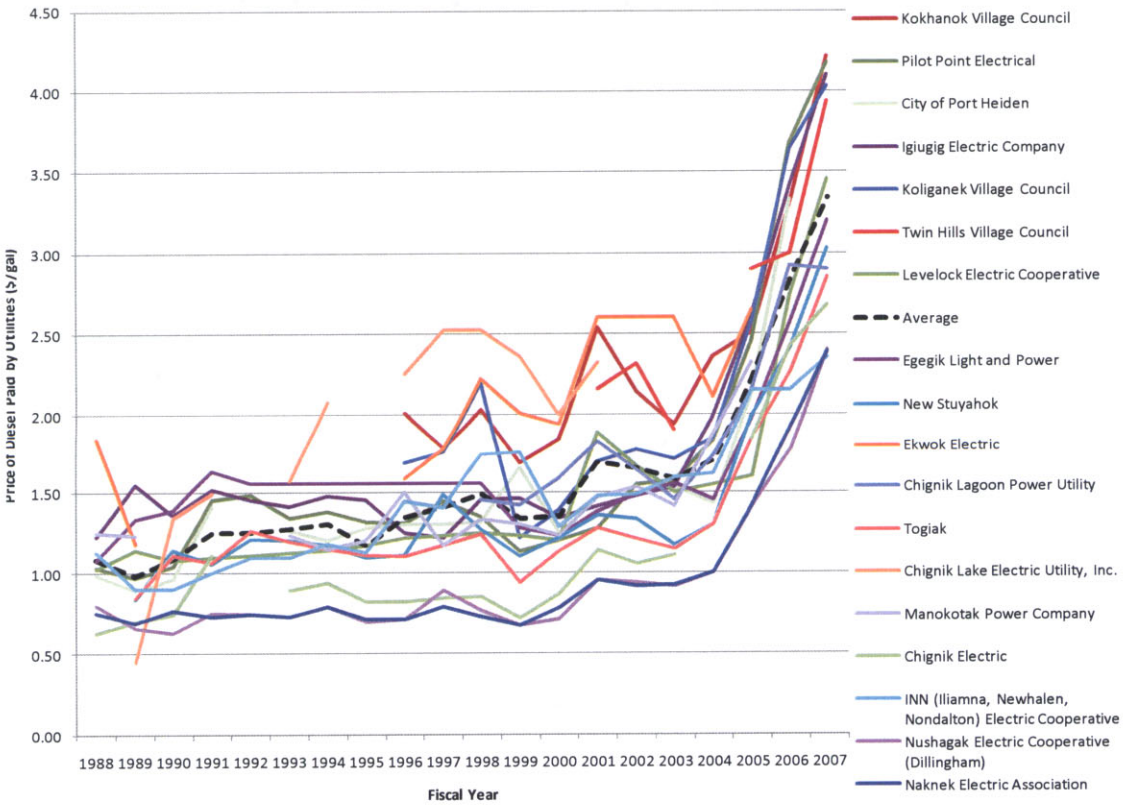
Figure 29. Average, Highest and Lowest Prices Paid by Utilities for Diesel 1988 - 2007



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

Figure 30 shows the prices paid for diesel fuel by regional utilities at a community level. The figure is intended to give a better feel for the range and variability in fuel costs by community. The data show the cost difference between larger communities such as Naknek and Dillingham and smaller communities such as Kokhanok, Pilot Point, and Port Heiden. These data suggest that size and not geographic location may be the most important determining factor in the price paid by utilities.

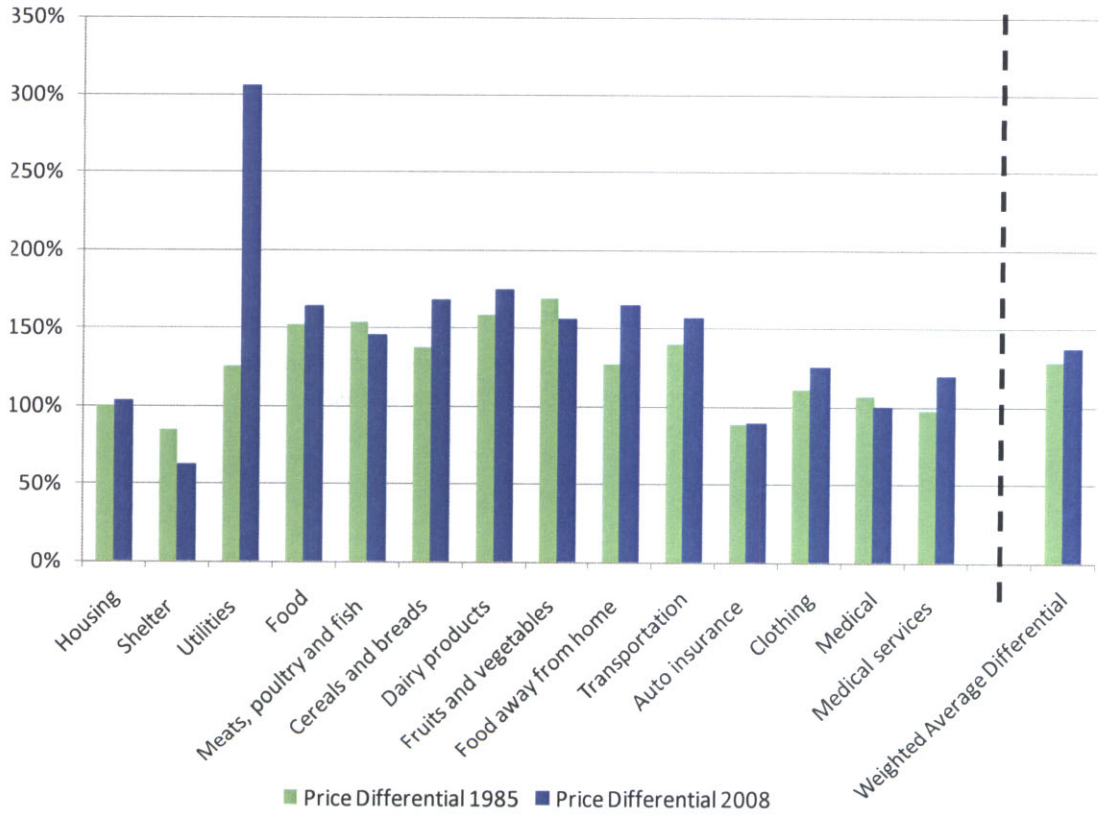
Figure 30. Prices Paid for Diesel Fuel by Specific Utilities, 1988 - 2007



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

Figure 31 shows cost of living comparisons from two AK Dept. of Administration studies on cost of living differentials in various regions. The two Alaka Geographic Differential Studies were both developed by the McDowell Group, the former in 1985 and the latter 2008 and 2009. Because they used similar methodologies comparison of living costs over time between Dilllingham[2] and Anchorage arepossible. In all categories except shelter and auto insurance the cost of living is higher in Dillingham than it is in Anchorage and in most categories the cost differential between Anchorage and Dillingham has increased from 19985 to 2008. This increasing gap may reflect that Anchorage has become a relatively less expensive place to live as its transportation links with the rest of the world have strengthened, but that rural Alaska has not fully participated in these gains.

Figure 31. Dept. of Defense Cost of Living Differentials in Dillingham as a Percent of Anchorage, 1985, 2008



Source: Figure developed by Northern Economics based on data from 1985 and 2008 Alaska Geographic Differential Study (McDowell Group, 1985), (McDowell Group, 2009).

[2] In the 1985 study, Dillinghame was combine with data from other communities in the Bristol Bay (Naknek, King Salmon and Iliamna) but the vast majority of the data reflect information for Dillingham, In the 2008 study results for Dillingham were reported separate from other communities.

5 Comparison of Vessel Capitalization by Residence

This study analyzed vessel characteristics to determine if vessels associated with individuals who lived in Bristol Bay communities are significantly different from vessels operated by individuals from other Alaska communities outside of Bristol Bay and vessels operated by individuals residing outside of Alaska.[3]

The data show that vessels operated by Bristol Bay residents (hereafter Bristol Bay resident vessels) are older, smaller, and shorter than vessels operated by individuals who reside outside of Bristol Bay communities. In addition, Bristol Bay vessels have lower horsepower ratings, less fuel capacity, and a lower penetration rate for refrigeration capabilities. Table 1 shows average (mean) vessel characteristics by regional group in five-year increments starting in 1983. The shading in the table denotes whether the means for Bristol Bay resident vessels and non-resident vessels are statistically significantly different from each other. Specifically:

- Shaded cells indicate areas where the mean for Bristol Bay resident vessels *underperform* their non-resident counterparts.
    - Darker shading indicates that the mean for Bristol Bay resident vessels is statistically significantly different at the 5 percent level (95 percent confidence).
    - Lighter shading indicates that the mean for Bristol Bay resident vessels is statistically significantly different at the 10 percent level (90 percent confidence).
- Outlined cells indicate where Bristol Bay resident vessel *outperformed* some non-resident vessels groups (e.g., newer-than-average vessels in 1983 and 1988).

[3] The analysts removed vessels from Togiak and Twin Hills from this analysis. These vessels tend to be much shorter in length than the average Bristol Bay vessel (26 feet vs 31.3 feet) and tend to only fish the super-exclusive Togiak fishery. We removed these vessels so that they would not drive the analysis. After the removal of the Togiak and Twin Hills vessels, the distribution of remaining vessels with LOA's at 26 feet or less were in proportion to the number of owners in three regional groups.

Table 1. Average Vessel Characteristics by Regional Group and Year

Group	1983	1988	1993	1998	2003	2008
Age of Vessel						
Bristol Bay	9.5	11.2	14.3	18.0	21.9	26.0
Alaska Outside of Bristol Bay	8.5	10.6	13.5	16.8	21.0	24.1
Outside of Alaska	11.0	12.0	12.7	15.6	20.0	24.0
Horsepower						
Bristol Bay	239.0	278.5	282.1	294.1	286.6	337.0
Alaska Outside of Bristol Bay	243.3	271.1	315.1	345.0	350.2	372.9
Outside of Alaska	251.7	285.7	335.3	367.9	371.9	382.0
Displacement (Gross Tons)						
Bristol Bay	10.1	11.6	11.8	12.3	11.9	12.0
Alaska Outside of Bristol Bay	11.6	12.9	13.4	13.4	13.7	14.5
Outside of Alaska	11.7	12.3	13.3	13.9	14.1	14.2
Fuel Capacity						
Bristol Bay	239.0	287.5	282.1	294.1	286.6	299.1
Alaska Outside of Bristol Bay	306.0	334.4	364.2	357.4	357.0	359.6
Outside of Alaska	283.4	311.3	347.9	352.2	349.6	363.7
Refrigeration Capabilities (% With)						
Bristol Bay	0.5%	0.5%	2.3%	4.5%	5.5%	7.7%
Alaska Outside of Bristol Bay	1.3%	2.3%	7.5%	13.7%	15.3%	20.8%
Outside of Alaska	0.5%	2.0%	8.1%	15.5%	17.8%	22.2%
Length						
Bristol Bay	30.6	31.4	31.2	31.4	31.3	31.3
Alaska Outside of Bristol Bay	31.0	31.4	31.6	31.6	31.5	31.6
Outside of Alaska	31.2	31.4	31.6	31.6	31.6	31.6

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

The characteristics of Bristol Bay resident vessels underperform their non-resident counterparts in every category the analysis measured, and in every case these differences are statically significant at the five percent level (95 percent confidence). In other words, the analysis is 95 percent confident that the true mean for participating Bristol Bay resident vessels is different from the true mean for non-resident vessels.

In some cases, a statistically significant difference in performance characteristics may not mean an actual difference in performance on the fishing grounds. On-the-grounds performance depends on many factors such as a skipper's skill and luck in a given year. However, the consistent nature of the results and the level of difference between resident and non-resident vessels, suggest that the average Bristol Bay resident vessel may be at a disadvantage on the grounds. For example, Bristol Bay resident vessels are 65 percent less likely to be equipped with a refrigeration system. Thus, without an external source of ice, Bristol Bay resident vessels are 65 percent less likely to be able to take advantage of a cooling bonus. Table 2 shows the percentage difference between the average Bristol Bay resident

vessel and the average vessel from outside Alaska while Table 3 shows the absolute difference.[4] These comparisons allow us to see:

1. When the difference between vessel groups began;
2. How this difference as changed over time;
3. Whether Bristol Bay resident vessels are gaining or losing ground.

The data show Bristol Bay resident vessels lost a substantial amount of ground between 1983 and 1993. Since 1993, the resident fleet has made up ground in some areas, but lost ground in other areas.

Table 2. Average Bristol Bay Vessel Compared to Average Non-Alaska Vessel by Performance Characteristic—Percentage Difference

Category	1983	1988	1993	1998	2003	2008
Age	16.1%	7.1%	-11.2%	-13.3%	-8.7%	-7.7%
Horsepower	-5.0%	-2.5%	-15.9%	-20.1%	-22.9%	-11.8%
Displacement	-13.7%	-5.7%	-11.3%	-11.5%	-15.6%	-15.5%
Fuel Capacity	-15.7%	-7.6%	-18.9%	-16.5%	-18.0%	-17.8%
Refrigeration Capabilities	0.0%	-75.0%	-71.6%	-71.0%	-69.1%	-65.3%
Length	-1.9%	0.0%	-1.3%	-0.6%	-0.9%	-0.9%

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

Table 3. Average Bristol Bay Vessel Compared to Average Non-Alaska Vessel by Performance Characteristic—Absolute Difference

Category	1983	1988	1993	1998	2003	2008
Age (Years)	-1.5	-0.8	1.6	2.4	1.9	2.0
Horsepower (HP)	-12.7	-7.2	-53.2	-73.8	-85.3	-45.0
Displacement (Tons)	-1.6	-0.7	-1.5	-1.6	-2.2	-2.2
Fuel Capacity (Gallons)	-44.4	-23.8	-65.8	-58.1	-63.0	-64.6
Refrigeration Capabilities (% Equipped)	0.0%	-1.5%	-5.8%	-11.0%	-12.3%	-14.5%
Length (Feet)	-0.60	0.00	-0.40	-0.20	-0.30	-0.30

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

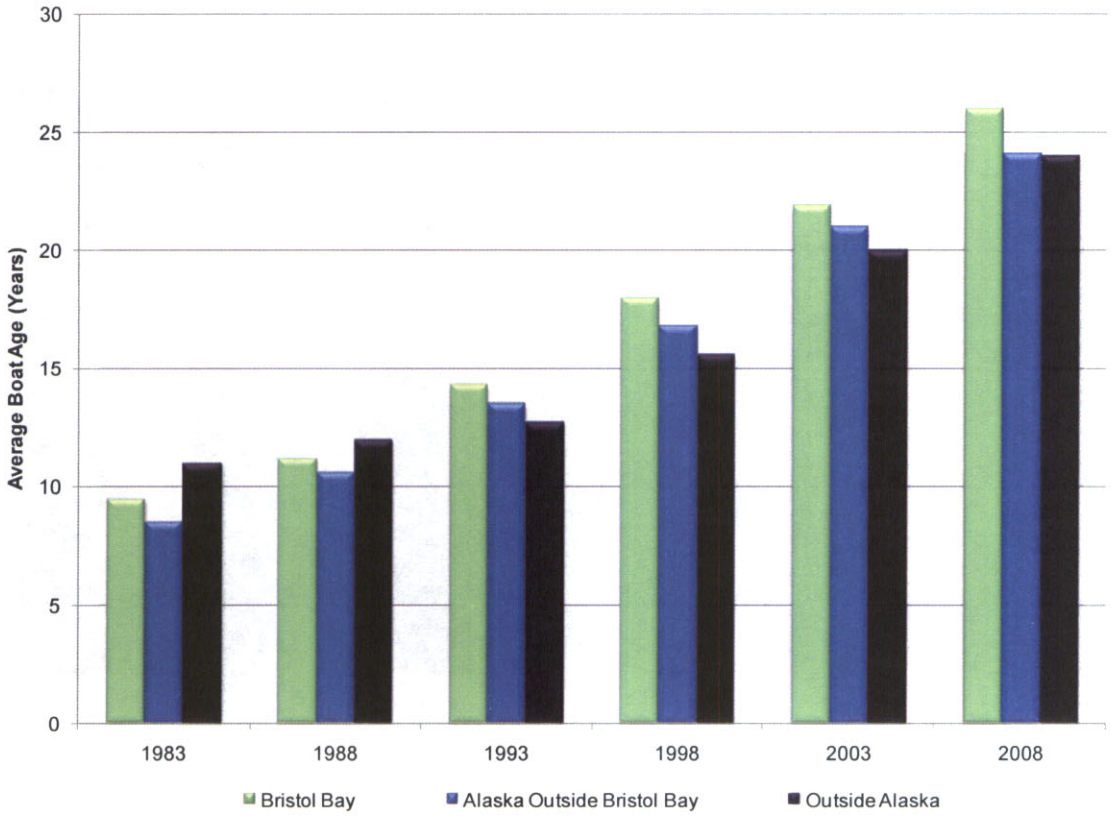
The following figures show detailed breakdowns by vessel characteristic for Bristol Bay, Alaska outside Bristol Bay, and non-Alaska vessels.

[4] We use the data for vessels outside of Alaska because statistical tests show that the difference in means for vessels outside Alaska and inside Alaska, but outside of Bristol Bay is statistically insignificant.

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.

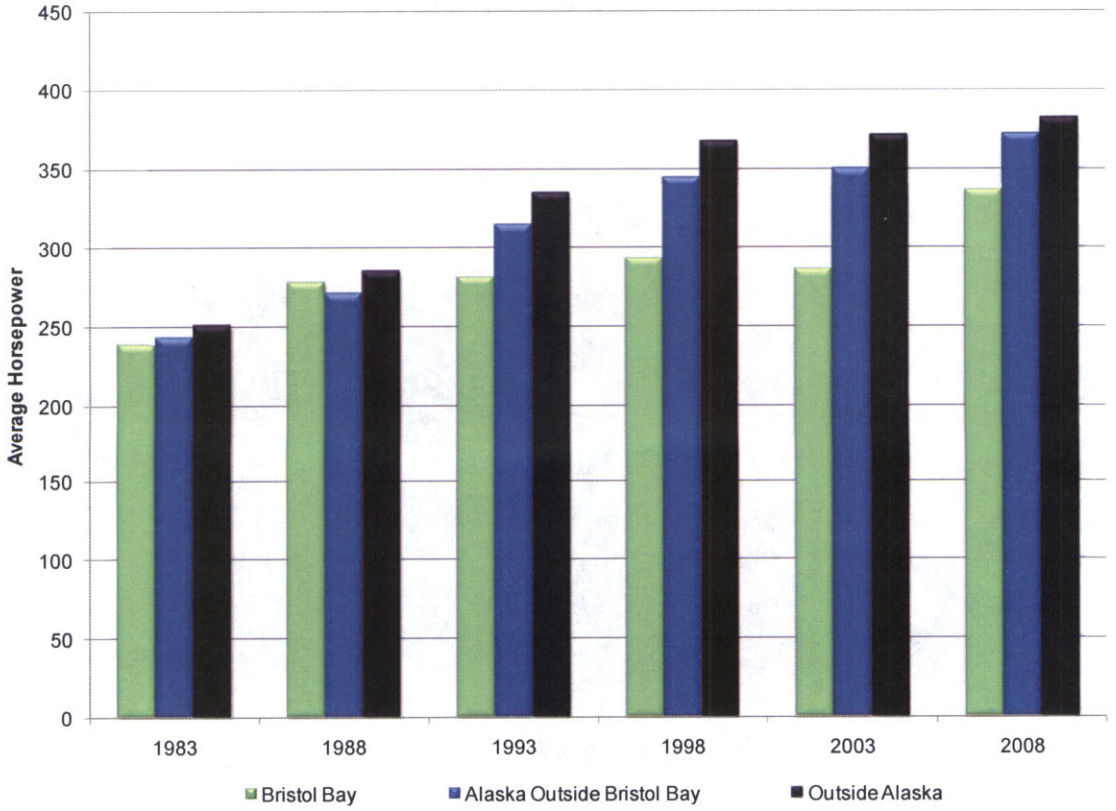
Figure 32. Average Age of Vessel by Residence, 1983 - 2008



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.

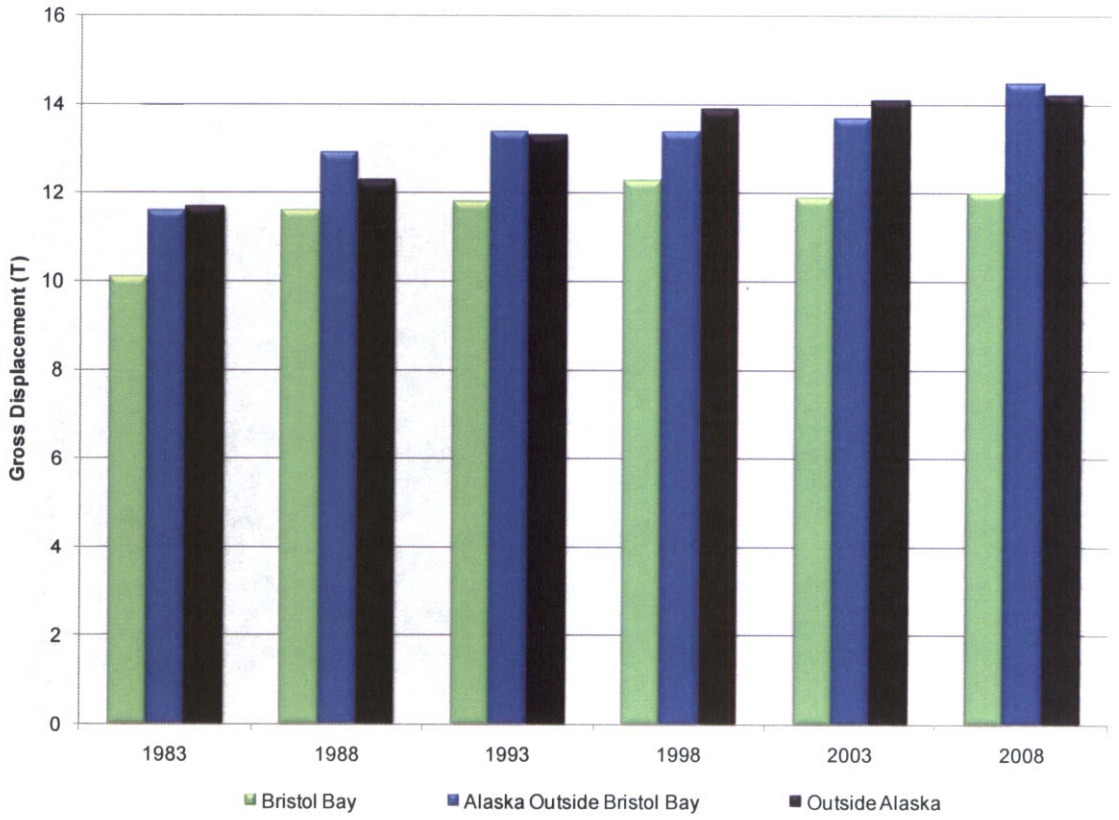
Figure 33. Average Horsepower of Vessels by Residence, 1983 - 2008



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

The Bristol Bay resident vessels averaged 1.6 tons, or were 13.7 percent smaller than their non-resident counterparts in 1983. In 2008, the average displacement differential was 2.2 tons, or 15.5 percent smaller.

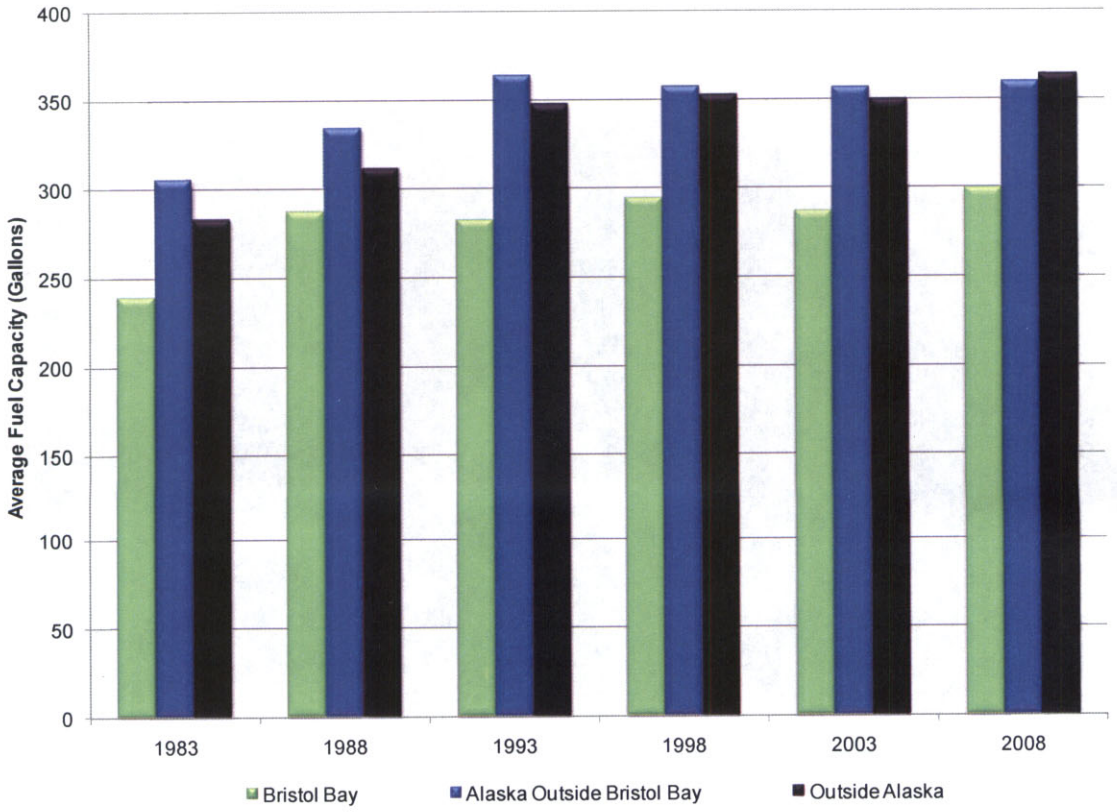
Figure 34. Average Gross Displacement Tons of Vessels by Residence, 1983 – 2008



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

The same pattern exists in fuel capacity where the data show that resident vessels averaged 15.7 percent and 17.5 percent smaller in 1983 and 2008 respectively. In both of these cases, resident boats lost a marginal amount of ground.

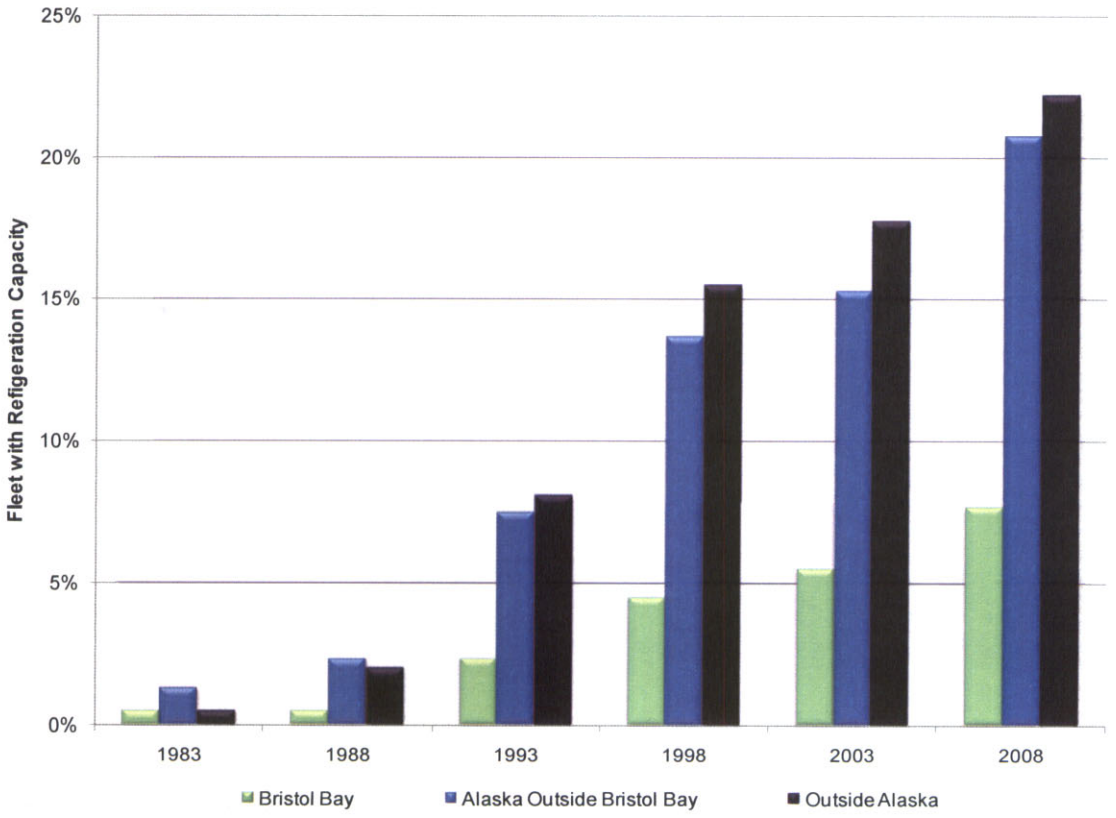
Figure 35. Average Fuel Capacity of Vessels by Residence, 1983 - 2008



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 36. Percent of Vessels with Refrigeration Capacity, 1983 - 2008



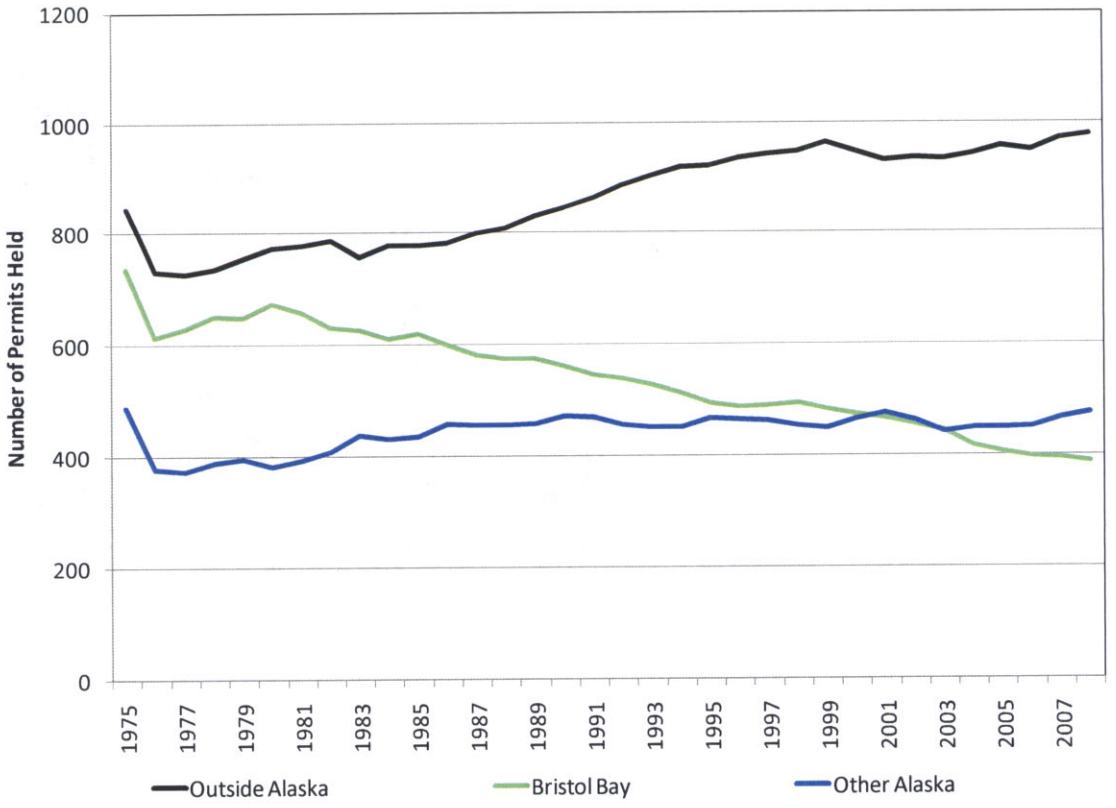
Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1983 - 2008).

6 Participation Patterns in the Bristol Bay 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.

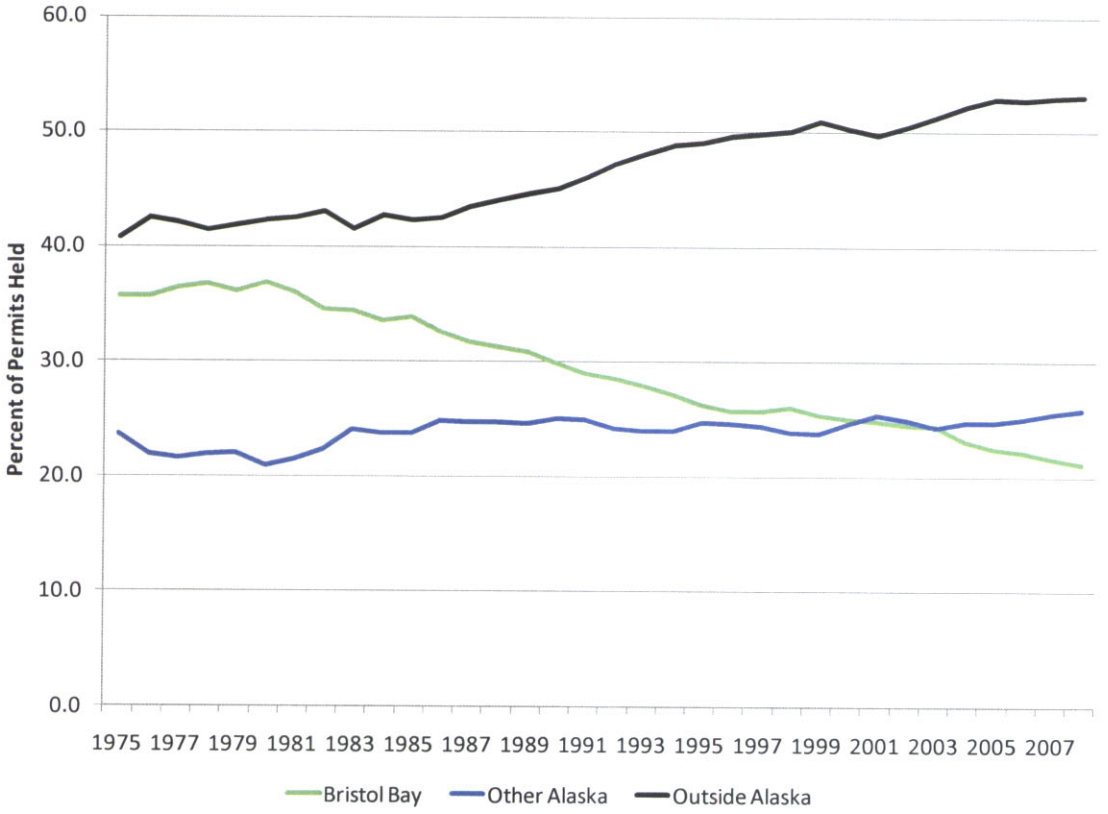
Figure 37. Number of Drift Gillnet Permits Held By Residence, 1975 - 2008



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

Figure 38 shows on a percentage basis what can be seen in actual number in Figure 37. The percentage of gillnet fishery permits belonging to individuals outside of Alaska is increasing slowly but steadily and been doing so for more than 30 years. The percentage of drift gillnet permits held by Alaskans from outside the Bristol Bay region is also increasing, but slowly. At the same time, the portion held by Bristol Bay residents continues to drop 0.4 percent per year.

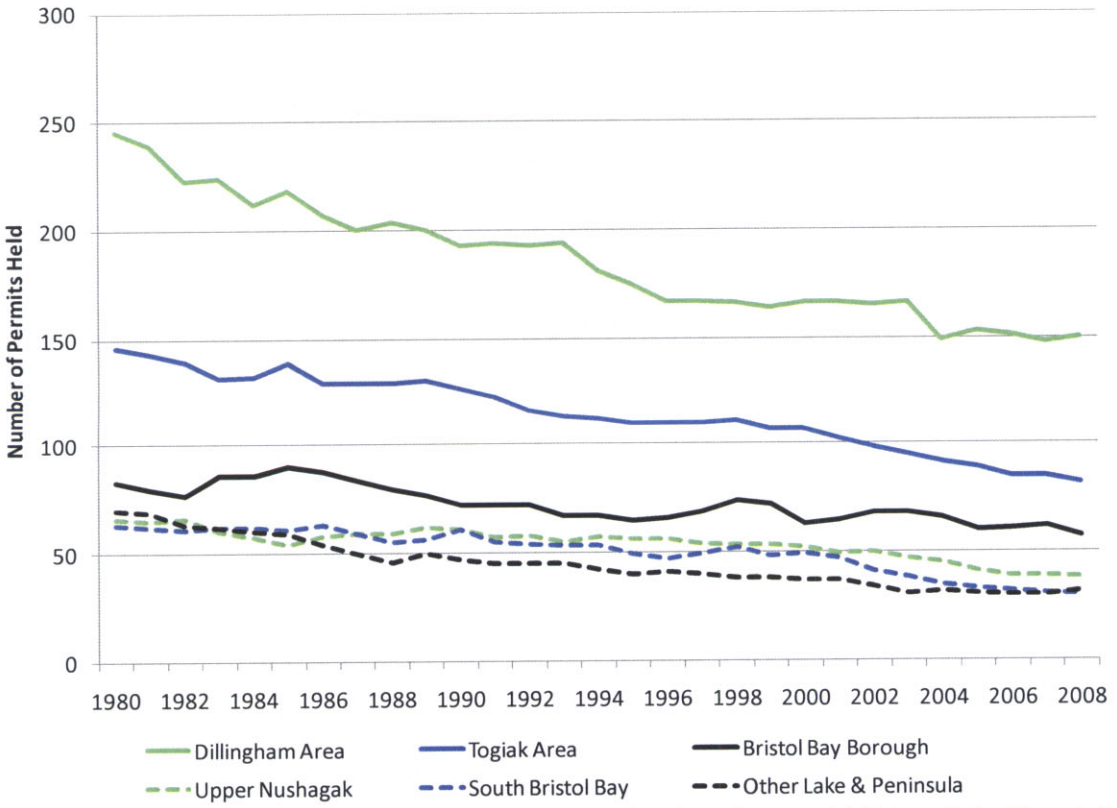
Figure 38. Percent of Drift Gillnet Permits Held By Residence, 1975 - 2008



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

Drift gillnet permit out-migration has occurred in each of the six Bristol Bay regions covered in this part of the analysis. However, while drift gillnet permit out-migration continues in areas such as Togiak and the Bristol Bay Borough, out-migration appears to have slowed in Dillingham, South Bristol Bay, and Other LPB areas. It is unclear why there is this difference between the communities. This analysis has noted that the DCA exhibits "healthier" population and school enrollment characteristics than some other communities, which may contribute to more permit retention.

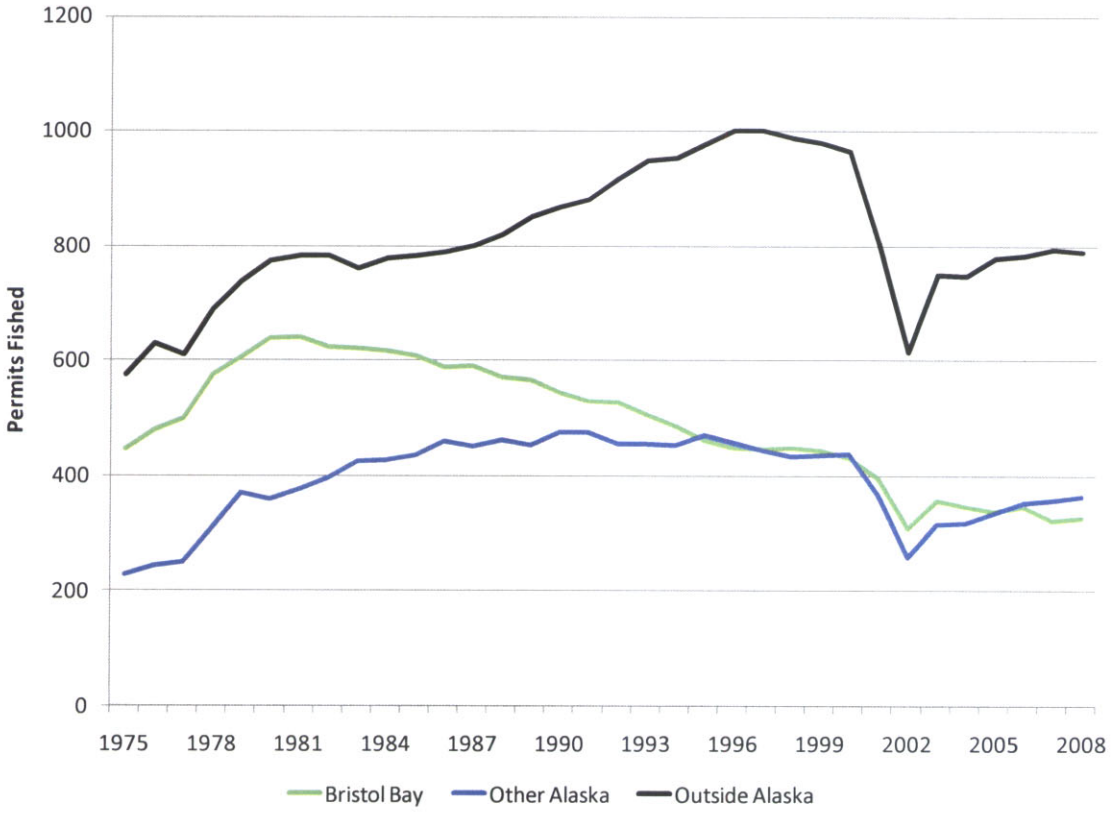
Figure 39. No. of Drift Gillnet Permits Held By Residence within the Bristol Bay Watershed, 1980 - 2008



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

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.

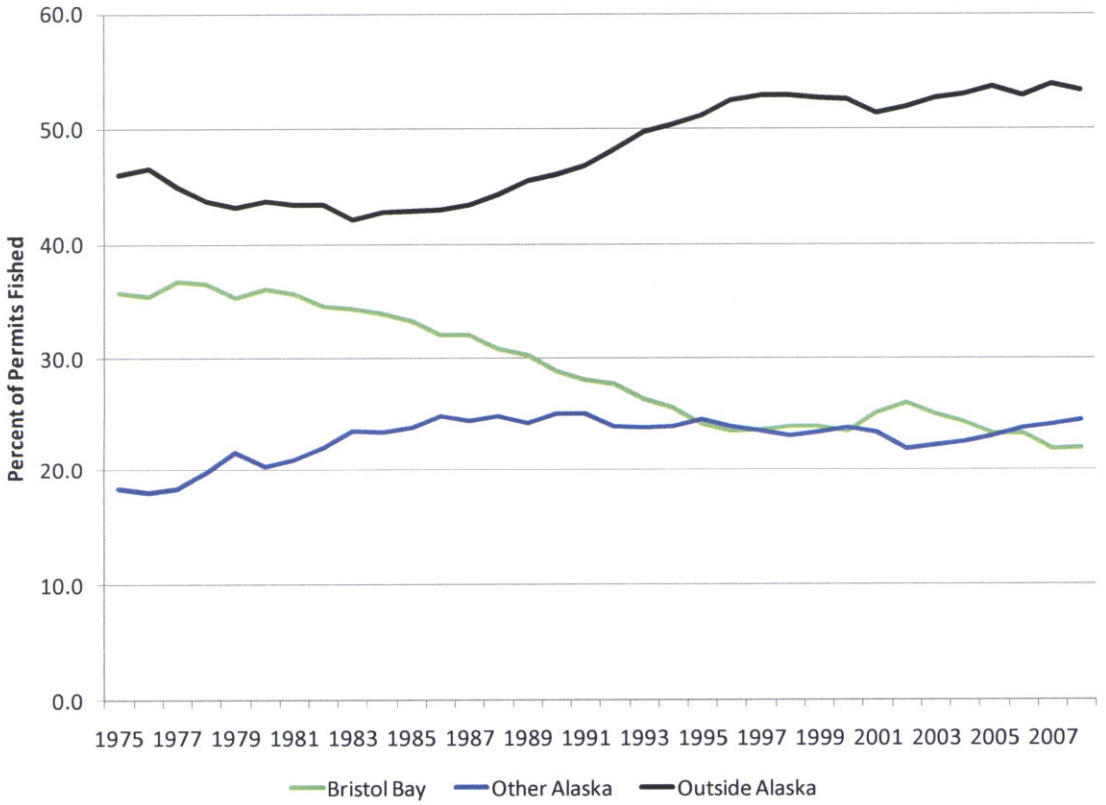
Figure 40. Number of Drift Gillnet Permits Fished By Residence, 1975 – 2008



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

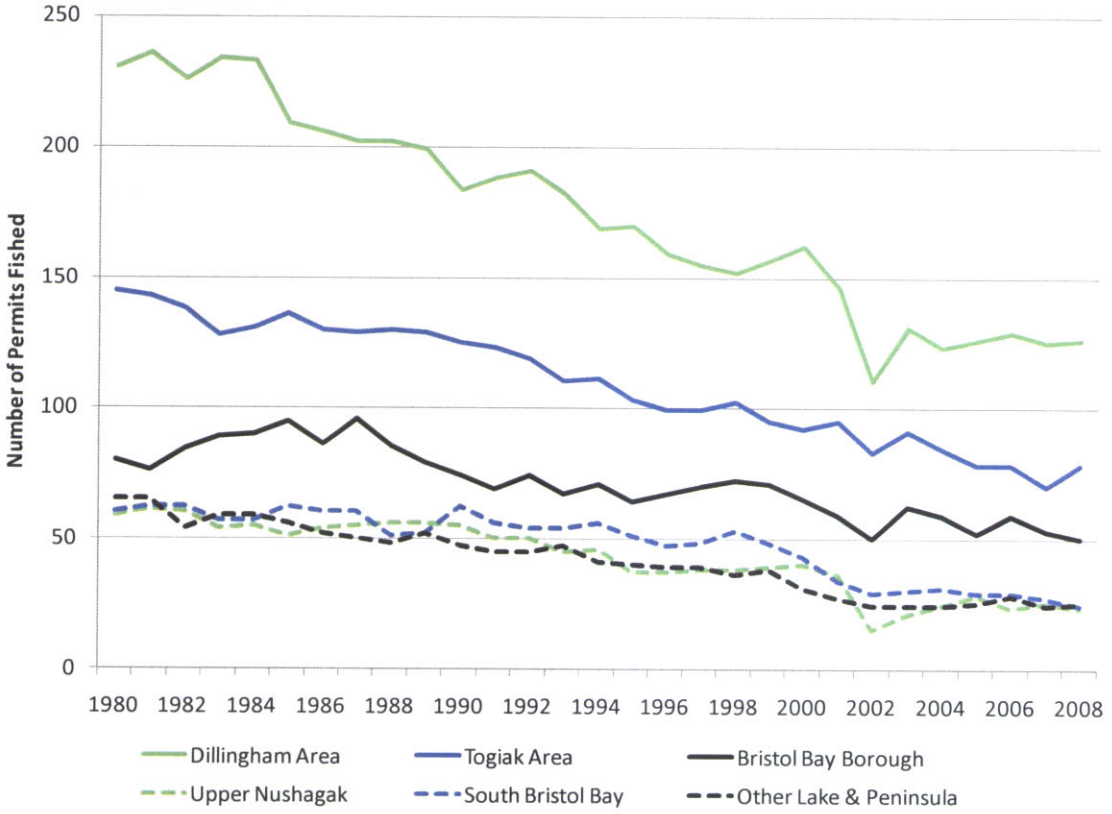
The percentage of drift permits fished by residents has dropped substantially since 1980 and now stands at just over 20 percent of the total number of permits fished. In recent years, the decline in resident participation as a portion of total participation has stabilized as Bristol Bay residents have participated at a higher rate than drift permit holders from outside the region—particularly permit holders from outside of Alaska.

Figure 41. Percent 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).

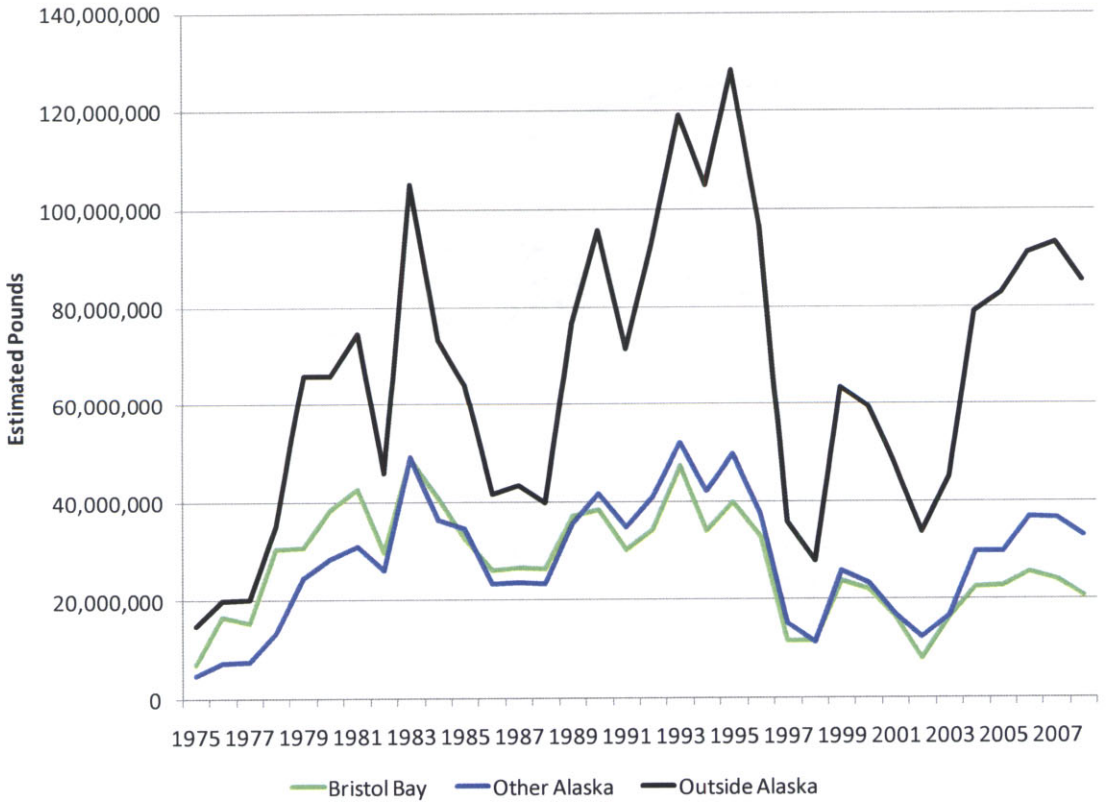
Figure 42. No. of Drift Gillnet Permits Fished By Residence within the Bristol Bay Watershed, 1980 - 2008



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

In 2008, permit holders from outside of Alaska harvested more Bristol Bay salmon by weight than the amount harvested by Alaskans from inside and outside of the Bay communities combined. Historically, drift permit holders from outside of Alaska have harvested more salmon by weight than any other group. In fact, there hasn't been a year since 1980 when permit holders from Outside of Alaska were not the largest harvesters of Bristol Bay salmon. However, the differential between this group and the other two groups declines in years of lower total harvest.

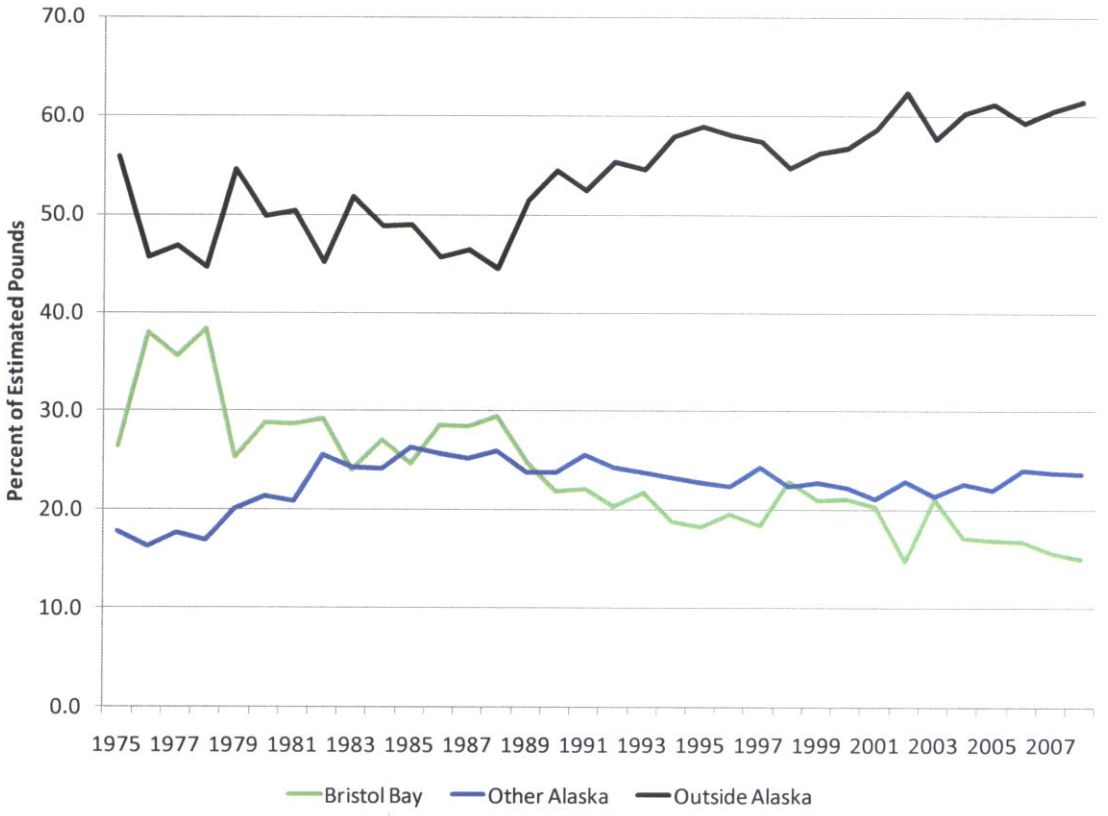
Figure 43. Total Pounds Harvested in the Drift Gillnet Fishery by Residence, 1975 - 2008



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

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.

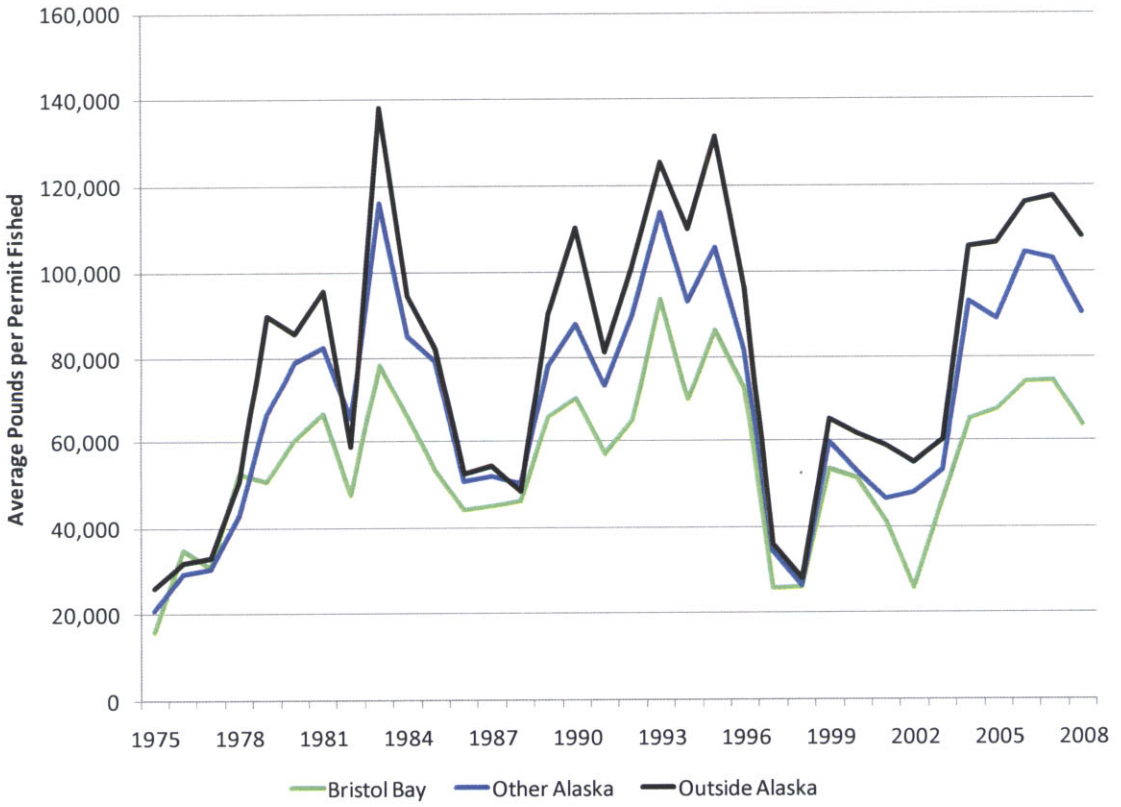
Figure 44. Percent of Total Pounds Harvested in the Drift Gillnet Fishery by Residence, 1975-2008



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.

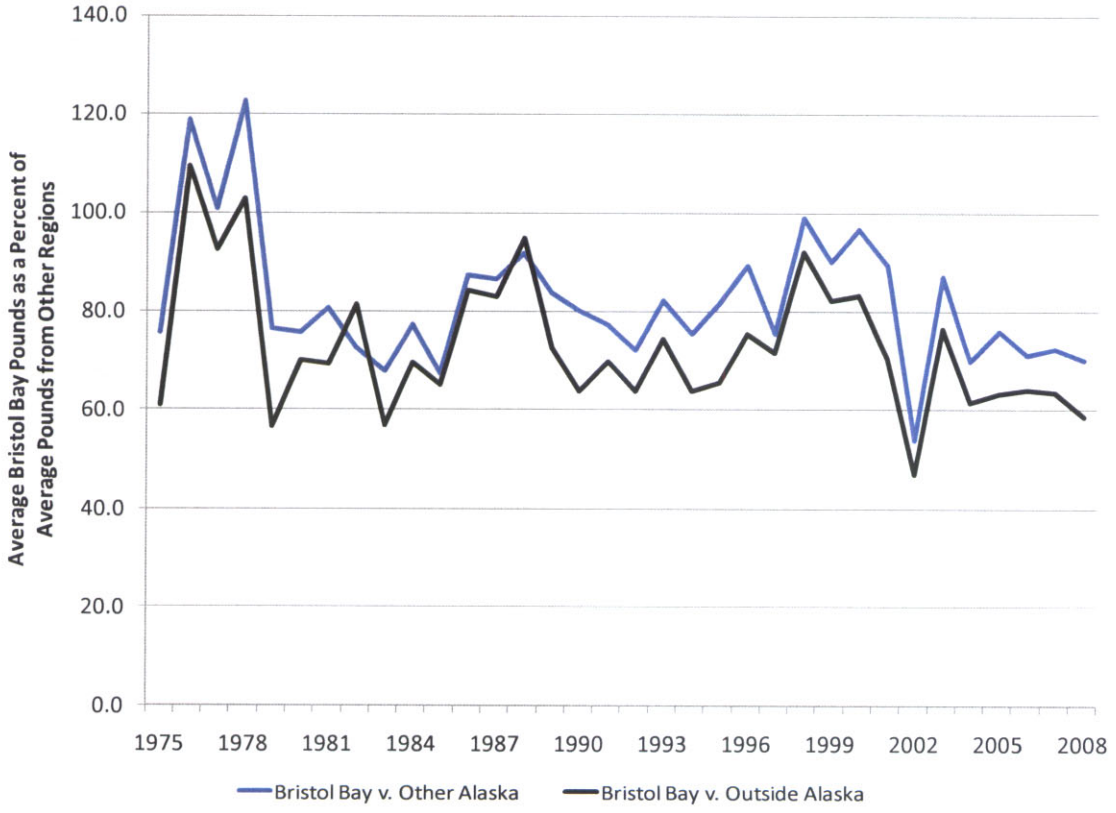
Figure 45. Average Pounds per Permit Fished in the Drift Gillnet Fishery by Residence, 1975 - 2008



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.

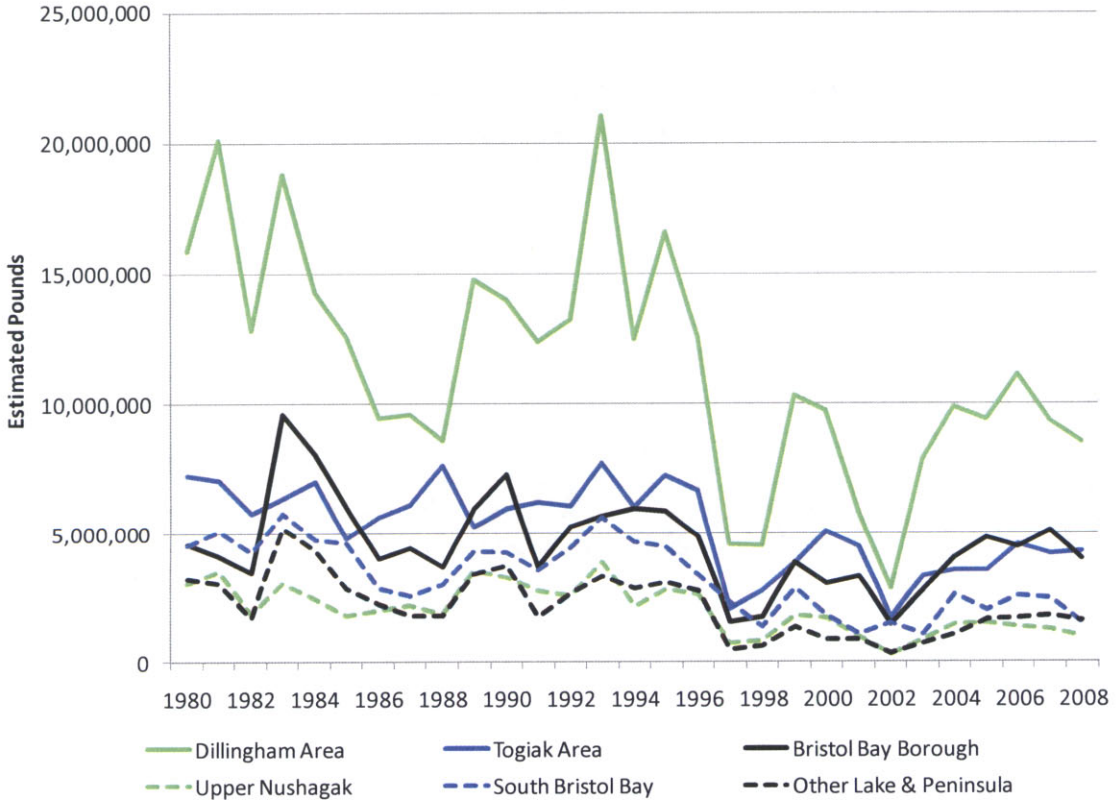
Figure 46. Average Lbs per Permit by Watershed Residents as a Percent of Average Lbs per Permit of Other Regions, 1975 - 2008



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

Figure 47 shows totals pounds harvested in the drift fishery by watershed residents by area.The data reflect changes in total fishery harvest and the out-migration trend.

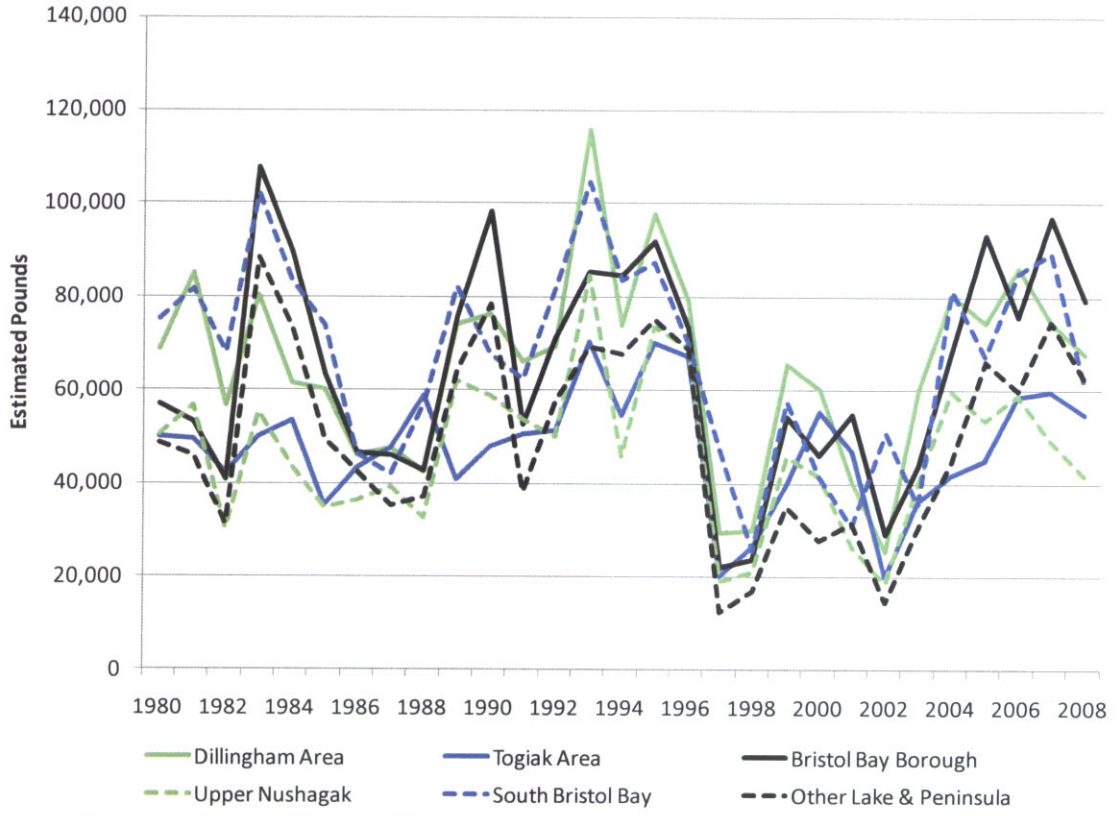
Figure 47. Total Pounds Harvested in the Drift Gillnet Fishery by Watershed Residents, 1980 - 2008



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

Average pounds harvested by permit by sub-region tends to follow a similar pattern year after year. In general, average harvest by watershed resident tends to move up and down together. That said, permit holders from some regions are consistently towards the upper end of average (Dillingham Area and Bristol Bay Borough) while holders from other regions consistently average towards the lower end of average (Upper Nushagak and Other Lake and Peninsula [Lake Region]).

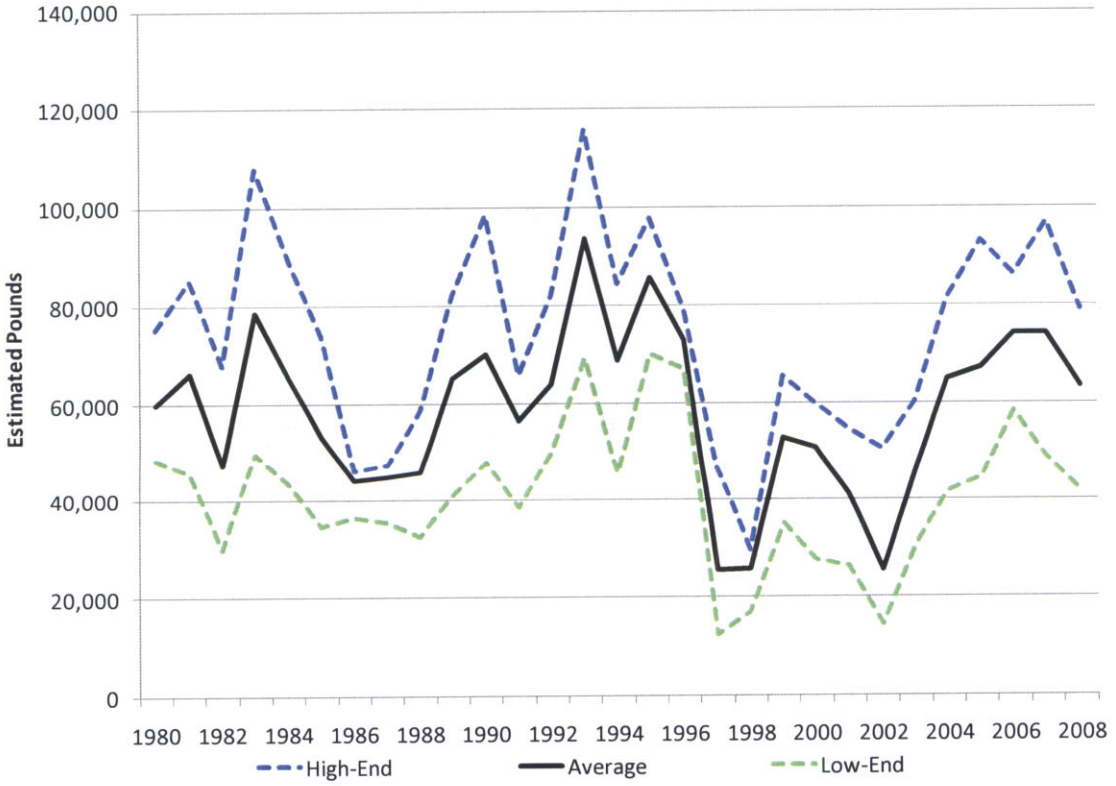
Figure 48. Average Lbs. Harvested / Permit in the Drift Gillnet Fishery by Watershed Residents, 1980 - 2008



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

This figure is created by taking the highest and lowest average revenue per drift net permit from each of the 6 sub-regions within the watershed. The figure shows the variability of average revenues by sub-region. The ranges are significantly greater for drift gillnet permit holders than for set net permit holders.

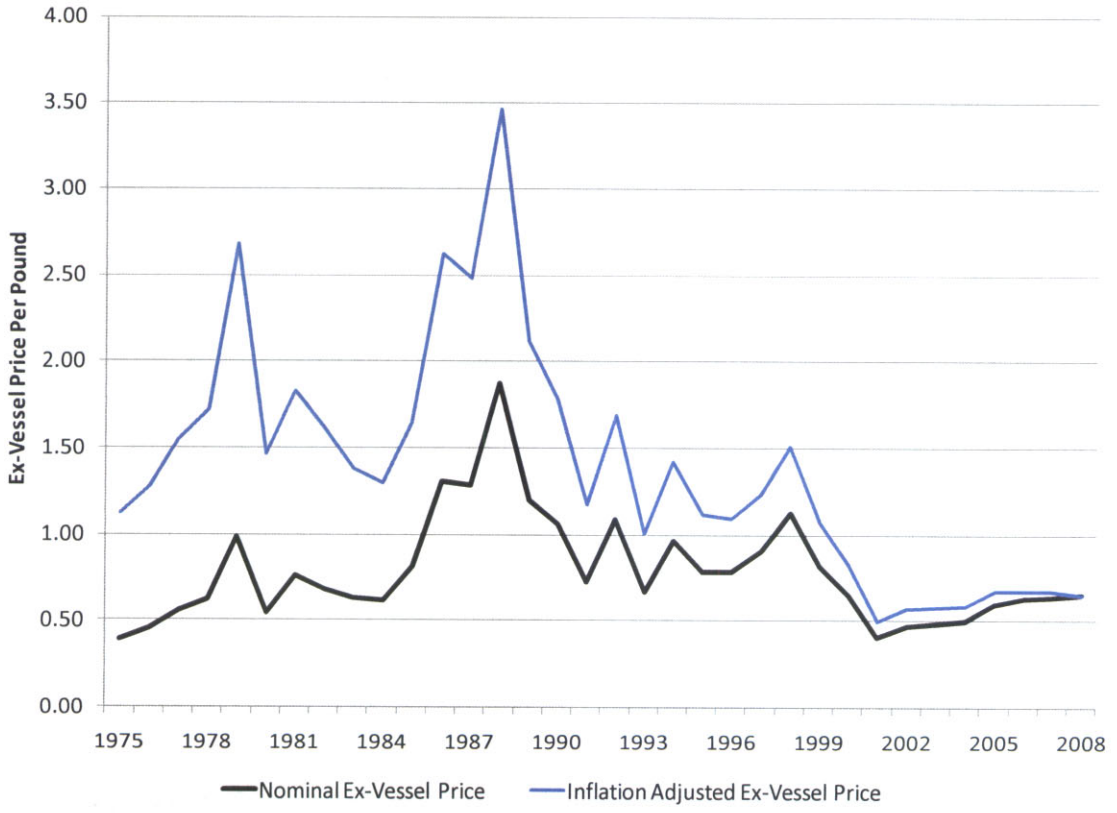
Figure 49. Range of Average Pounds per Permit by Various Regions within the Watershed, 1980 - 2008



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

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.

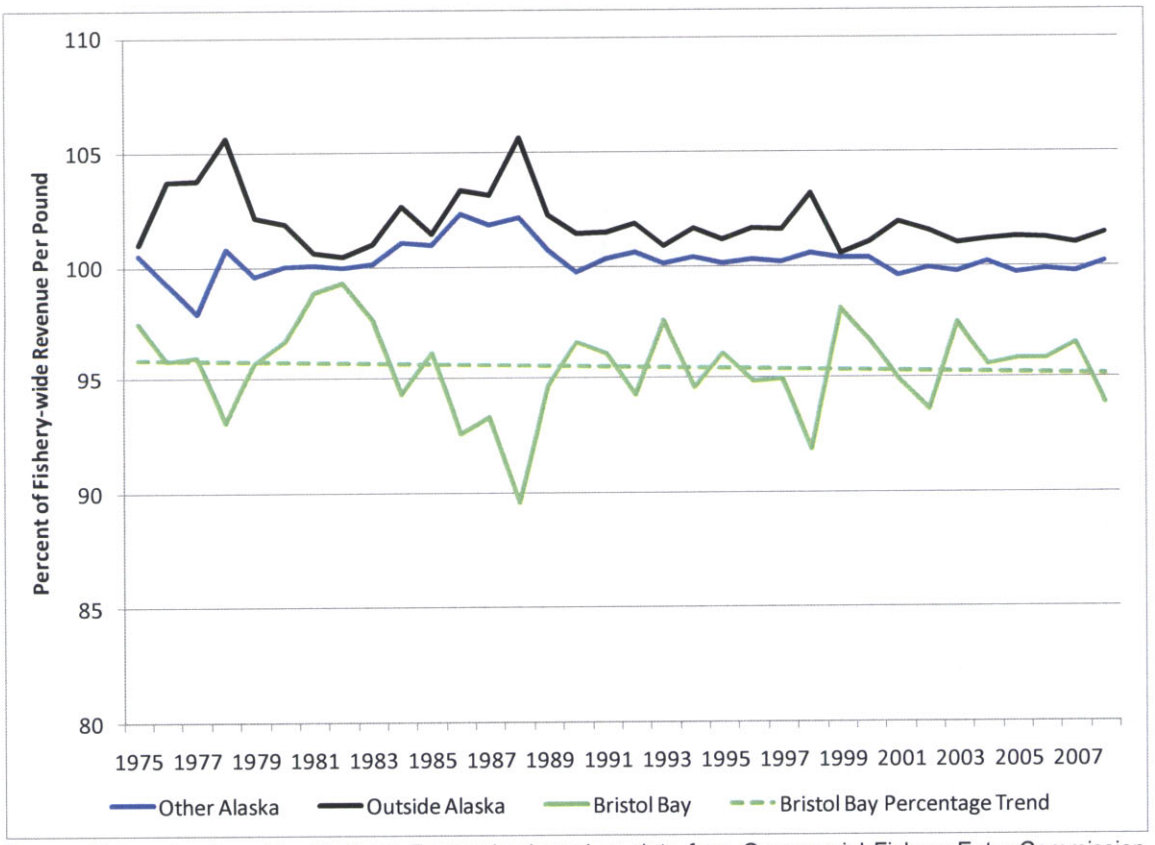
Figure 50. Imputed Nominal and Real (Adjusted for Inflation) Revenue per Pound Landed, 1975 - 2008



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[5] (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 51. Revenue per Pound by Region as a Percent of Overall Revenue per Pound, 1975 – 2008

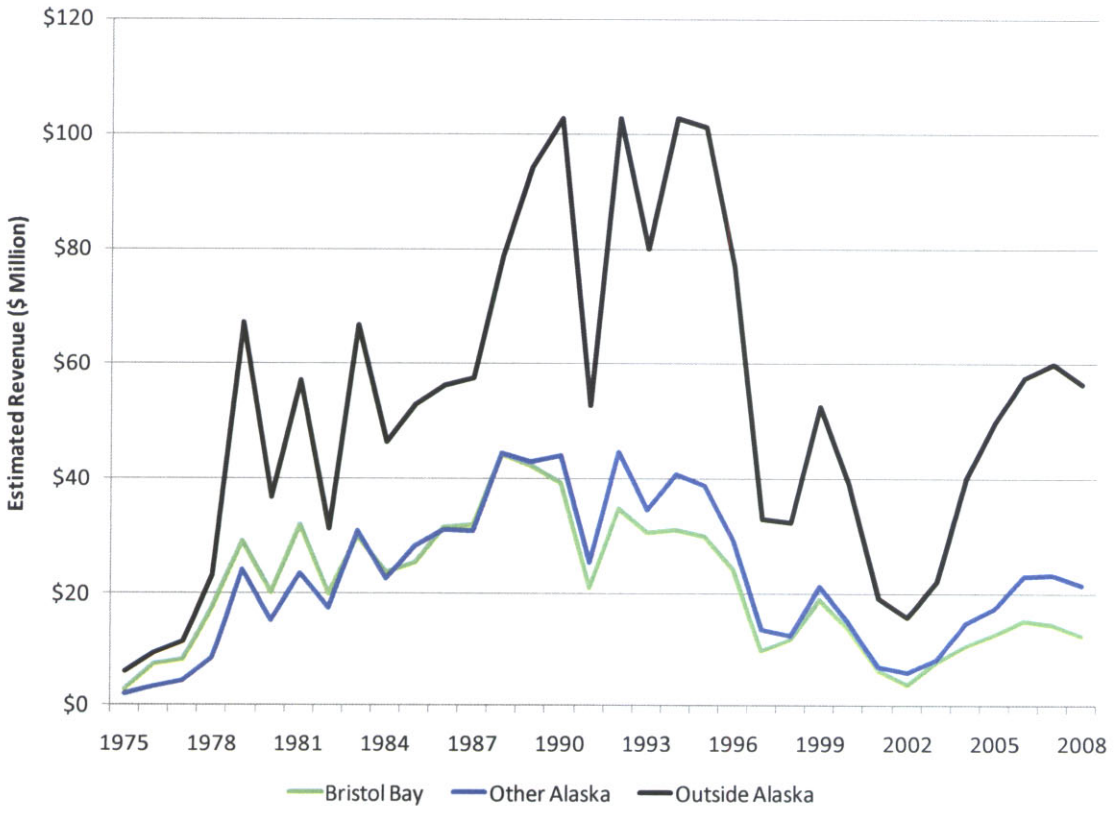


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

[5] 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 52. Ex-vessel Revenue in the Drift Gillnet Fishery by Region of Residence, 1975 – 2008

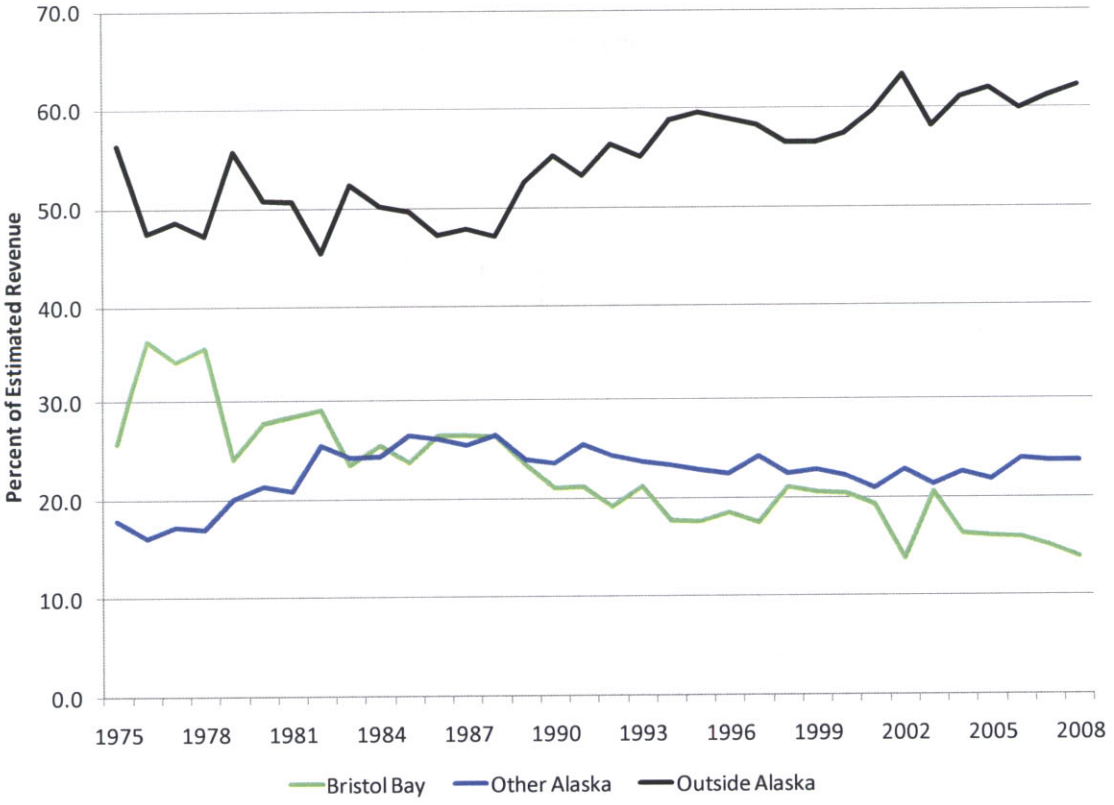


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

The percent of total revenue in the fishery attributable to the permit holders from the different regions reflects the previously discussed patterns:

- There is a long-term trend towards a higher percentage of revenue heading to permit holders who live outside of Alaska.
- The percentage attributable to non-Bristol Bay Alaskan permit holders is roughly stable.
- The percentage attributable to Bristol Bay permit holders is declining.

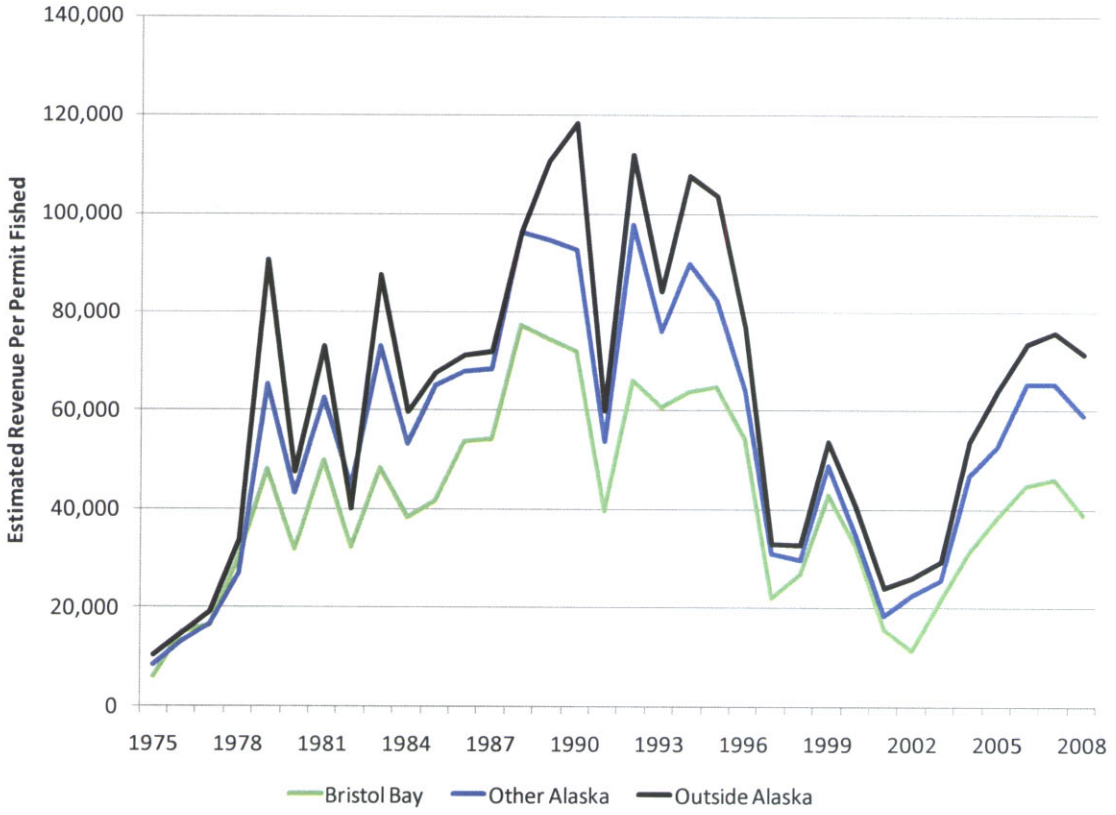
Figure 53. Percent of Total Revenue in the Drift Gillnet Fishery by Residence, 1975 - 2008



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.

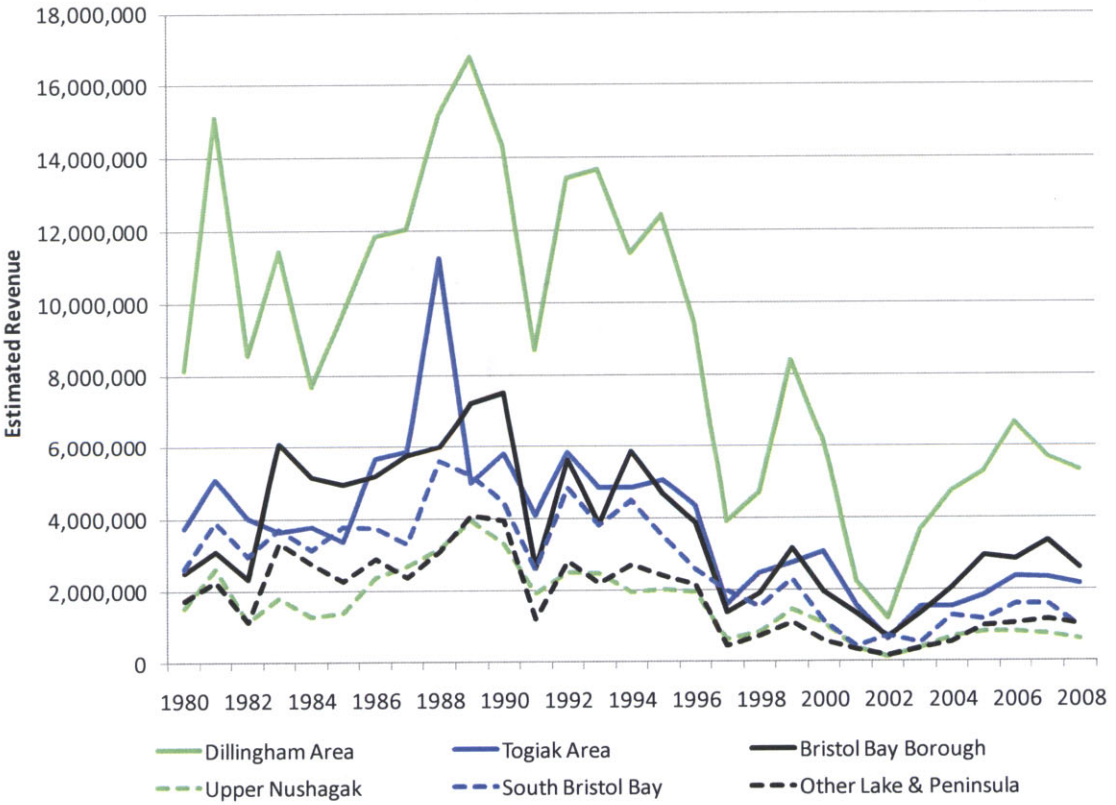
Figure 54. Average Revenue per Permit Fished in the Drift Gillnet Fishery by Residence, 1975 - 2008



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

The total revenue in the drift gillnet fishery follows a downward trending pattern, which reflects the declining number of permits in the fishery and the lower prices fishermen have received in recent years. In general, though, the total revenue attributable to each area in the watershed follows the pattern seen over the past 30 years: Dillingham, Bristol Bay Borough, and Togiak area residents were on top in total revenue with Upper Nushagak residents totaling the lowest total amount of revenue.

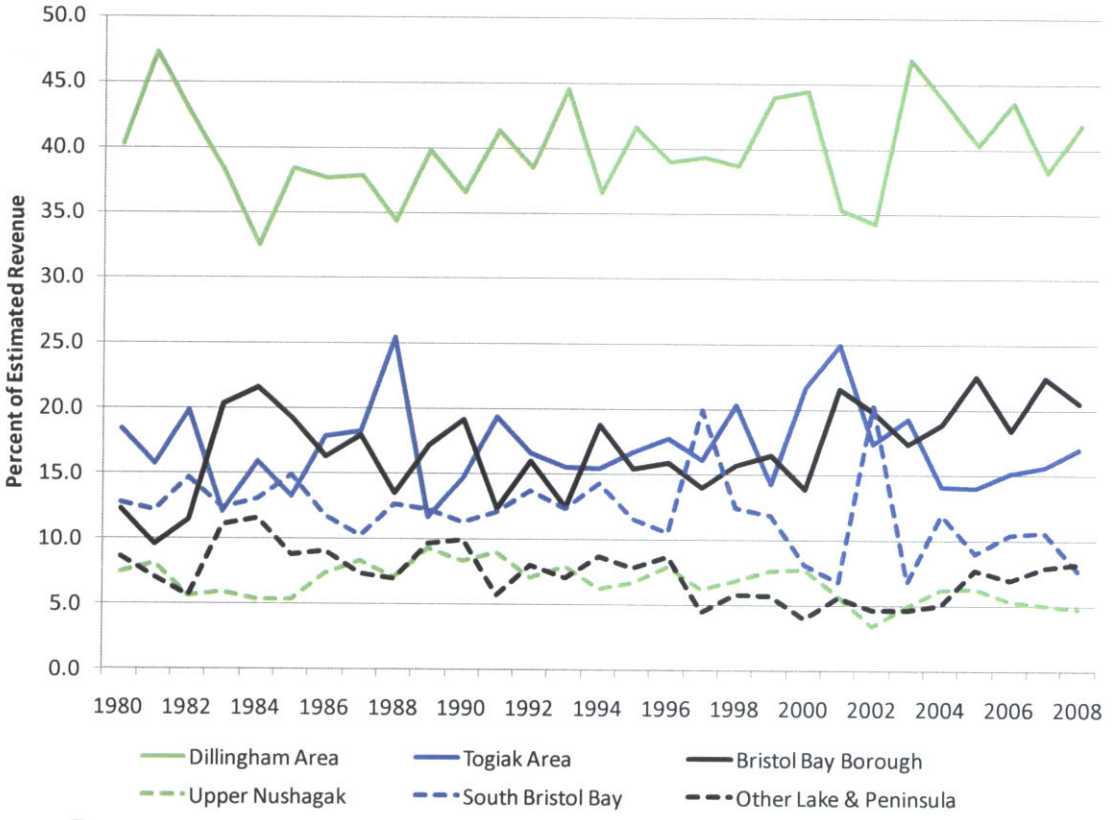
Figure 55. Total Revenue in the Drift Gillnet Fishery by Watershed Residents, 1980 - 2008



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

Figure 56 reflects the data shown in Figure 55 as a percentage of total watershed revenues from the fishery. As noted above, the relative pattern has roughly stayed the same in recent years with Dillingham residents accounting for 35 to 45 percent of total drift revenue in the watershed and the other regions following a relatively stable relative order (e.g., Togiak and BBB at the top and Upper Nushagak and Other Lake and Peninsula at the bottom).

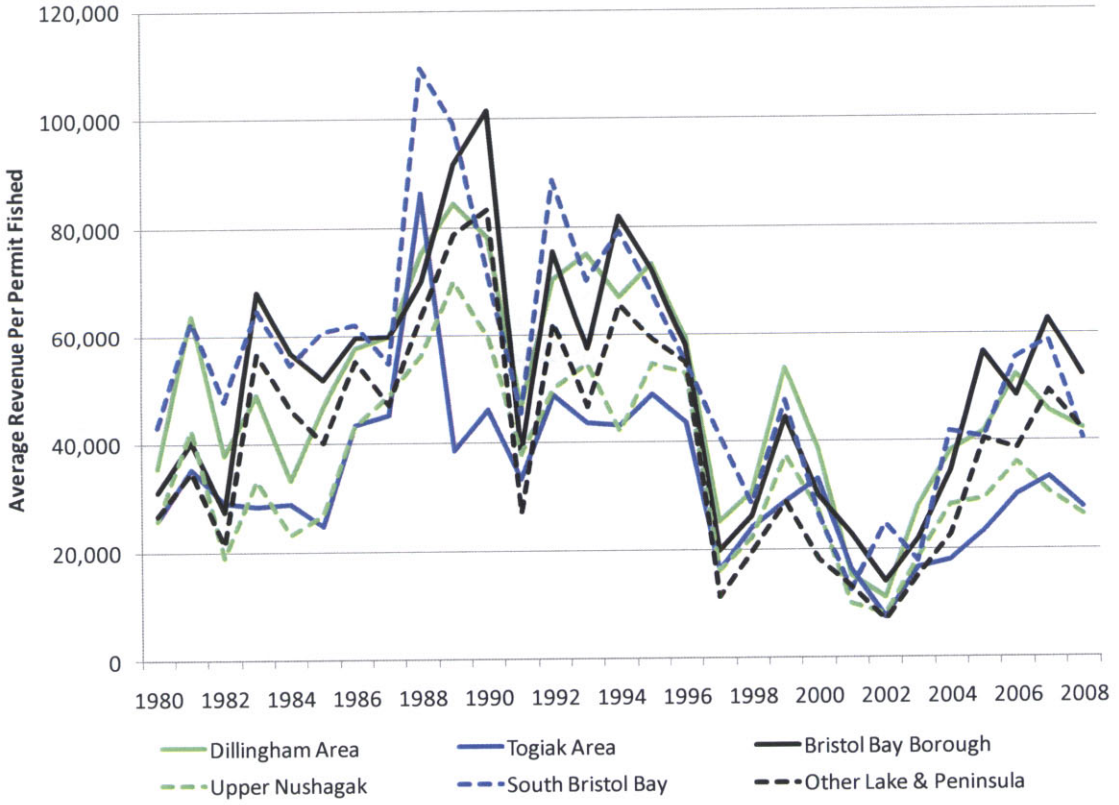
Figure 56. Percent of Total Watershed Revenue in the Drift Gillnet Fishery by Area of Residence, 1980 - 2008



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

When calculated on a per permit fished basis, the pattern seen in the total revenue data shifts. While all permit holders tend to have better or worse years together, some areas that have middling total revenue data do well on a per-permit basis. For example, the South Bristol Bay group consistently appears towards the middle of the total revenue figures, but consistently appears towards the top of the per-permit data. Togiak area and Upper Nushagak residents consistently appear towards the bottom. Bristol Bay Borough and Dillingham residents tend to be towards the top, perhaps because their geographic location allows them to fish the shoulders of the season more easily than Upper Nushagak residents.

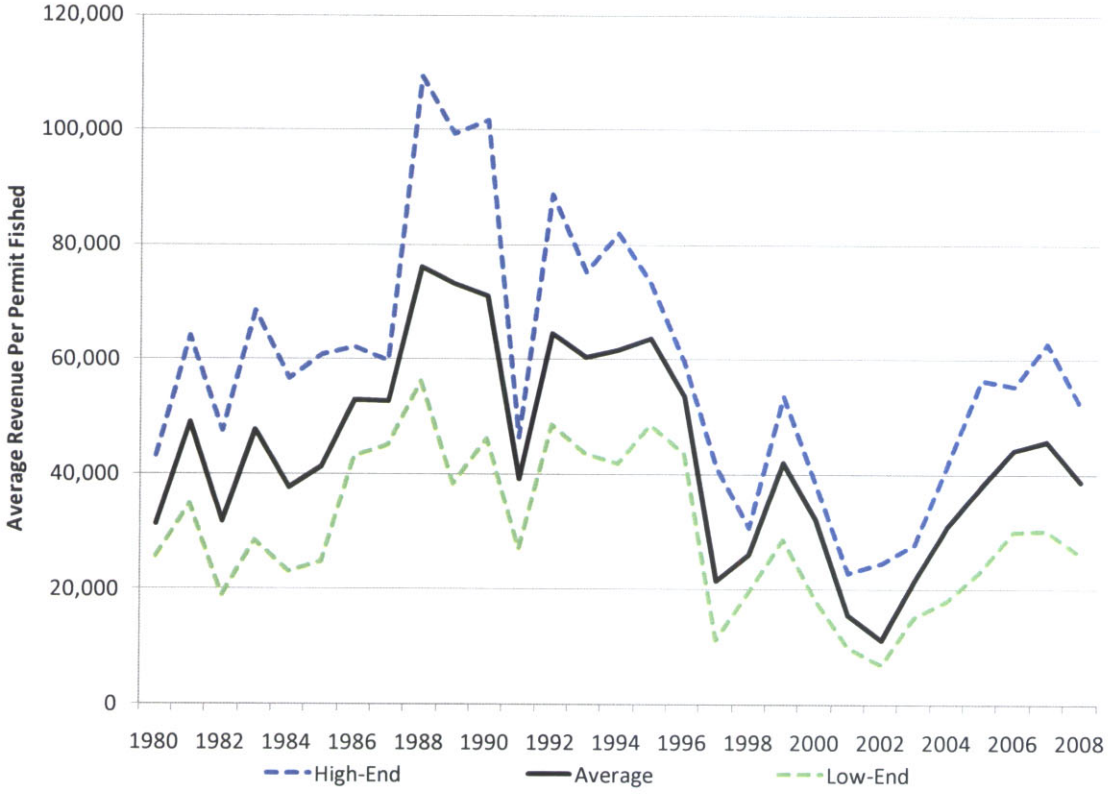
Figure 57. Average Revenue / Permit Fished in the Drift Gillnet Fishery by Watershed Residents, 1980 - 2008



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

Figure 58 shows the range of average revenues by drift permit holders. The data show that while the high-end. average, and low-end tend to move together the difference between high-end and low-end average can be as much as twice the low-end average. The data also show that in years of lower abundance the high-end comes very close to the average. These data reflect that better-than-average fishermen tend to do much better in times when there are lots of fish and their skill set can be utilized to the maximum extent possible.

Figure 58. Range of Average Revenues / Drift Gillnet Permit within the Watershed, 1980 - 2008

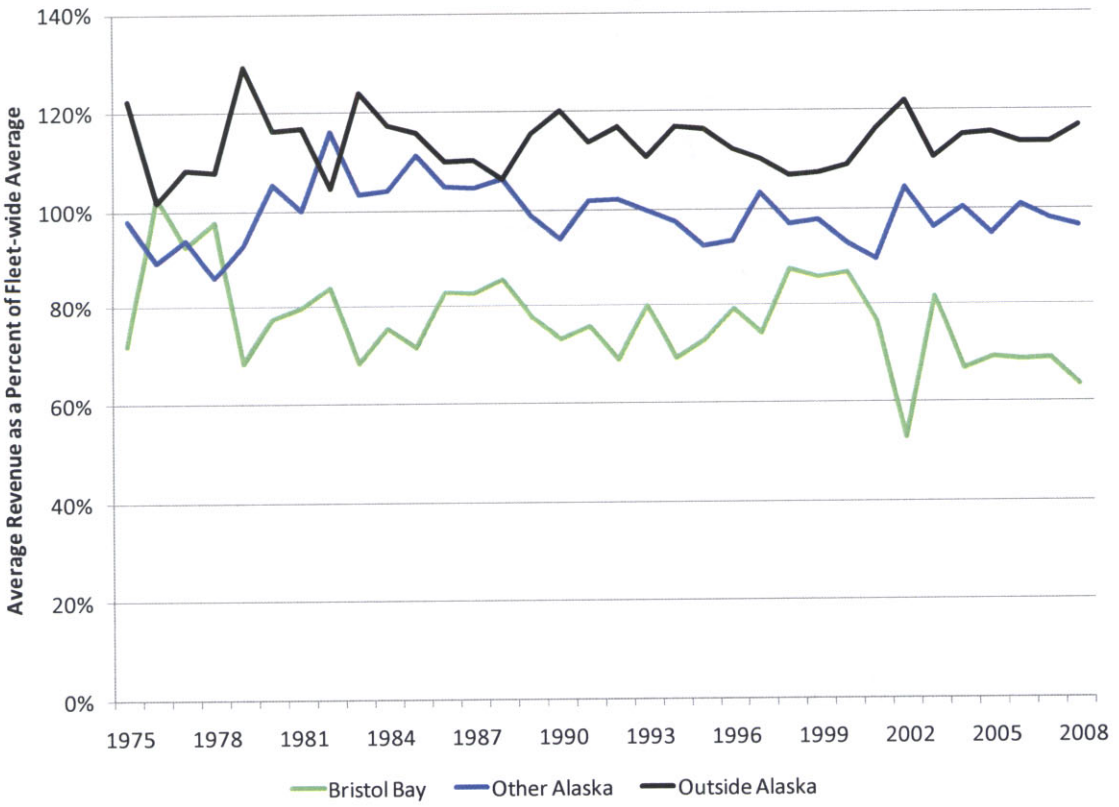


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008).

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.

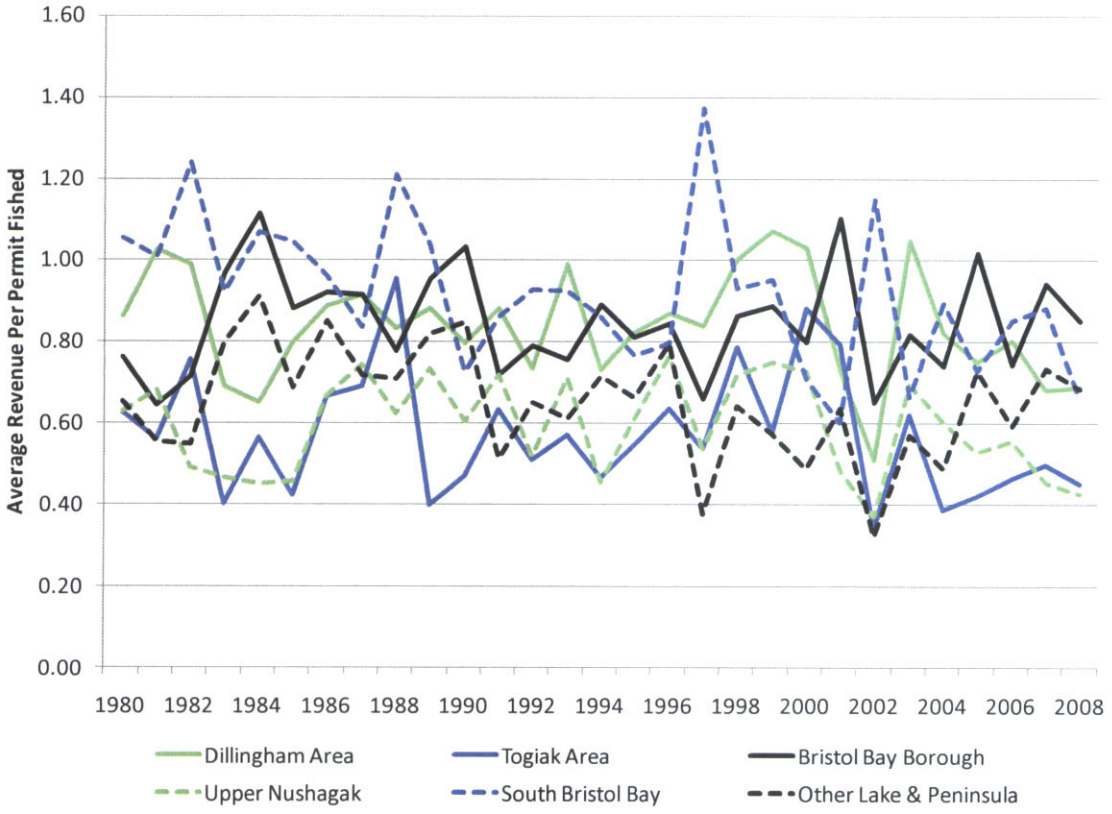
Figure 59. Average Revenue by Residence as a Percent of Fishery-Wide Average Revenue, 1975 – 2008



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

Figure 60 shows average revenue in the drift fishery as a percentage of the fishery wide average. Permit holders from the watershed consistently average less revenue per permit than the average for all permit holders.The only watershed regions which broach or approach the fishery-wide average are the South Bristol Bay, BBB, and Dilingham area groups and even these groups do not consistently hit average. By contrast,Togiak area permit holder consistently generateless than 60 percent of the fishery wide average per permit.

Figure 60. Average Drift Gillnet Revenue in the Watershed as a Percent of Fishery-wide Average, 1980 - 2009

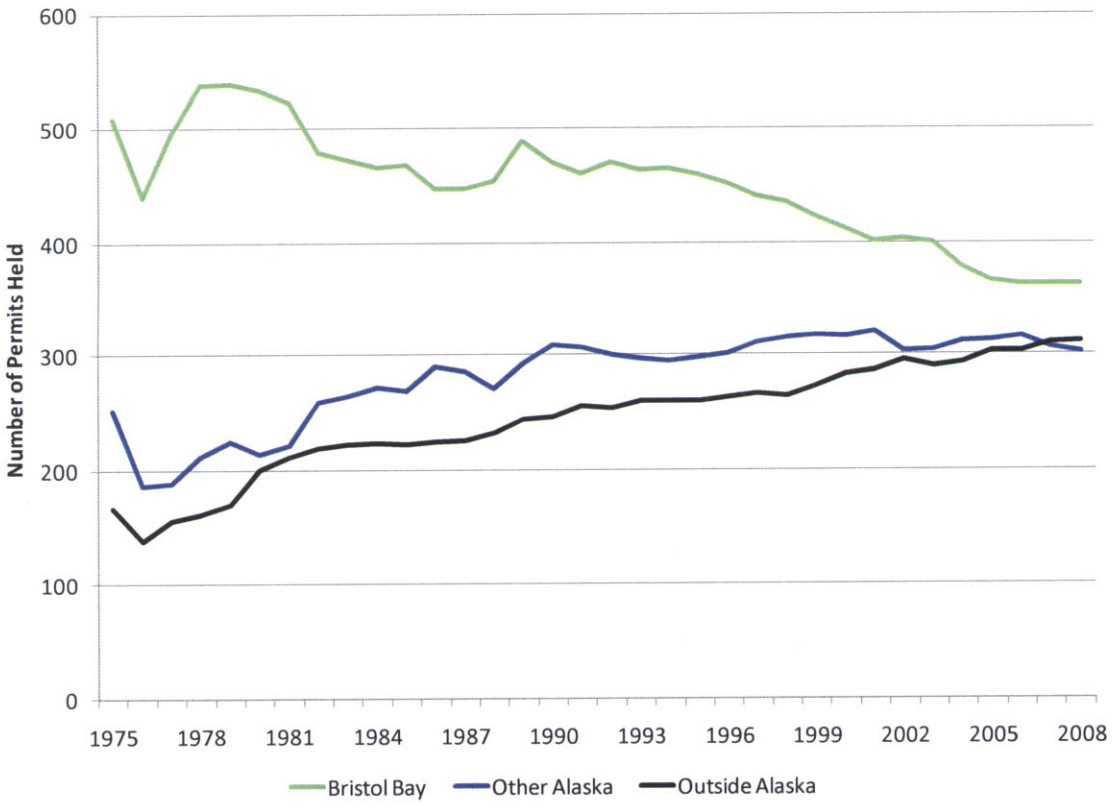


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008).

7 Participation Patterns in the Bristol Bay 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 61. Number of Set Gillnet Permits Held By Residence, 1975 - 2008

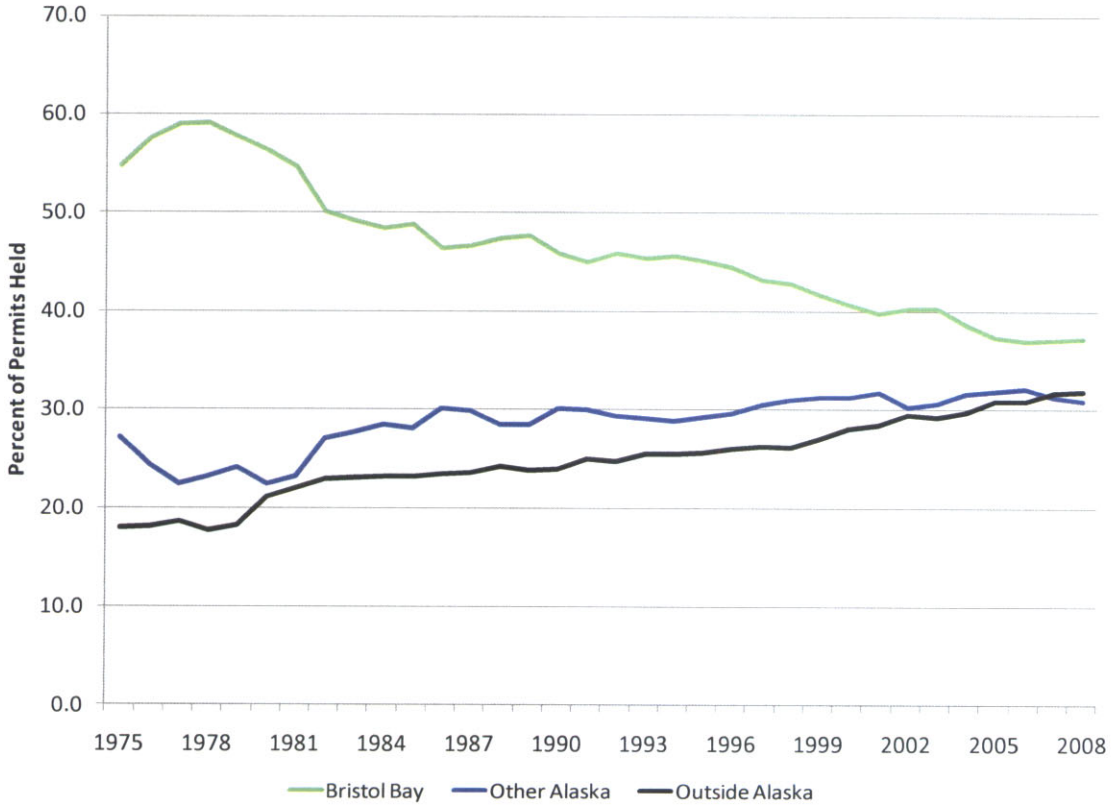


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008) and (CFEC, 2009).

Figure 62 shows the same picture as 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 61 except as a percent of total set gillnet permits.

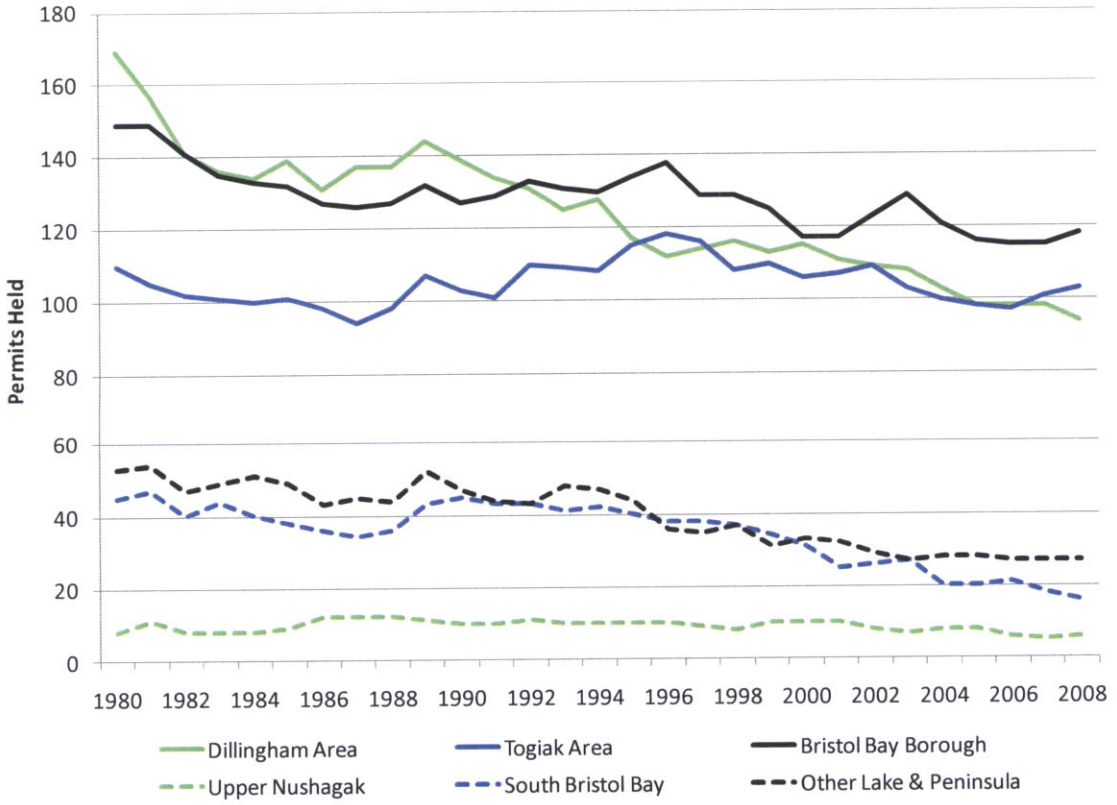
Figure 62. Percent of Set Gillnet Permits Held By Residence, 1975 - 2008



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

The CFEC data show the number of set net permits held by watershed resident is declining in most of the sub-areas covered by this analysis. While the number of permits in the Togiak area has been relatively stable and the number of permits in the BBB has stabilized, the number of permits held in the Dillingham and South Bristol Bay areas continues to drop. It would appear that the Upper Nushagak and Other Lake & Peninsula areas have also stabilized after declining throughout the 1990s.

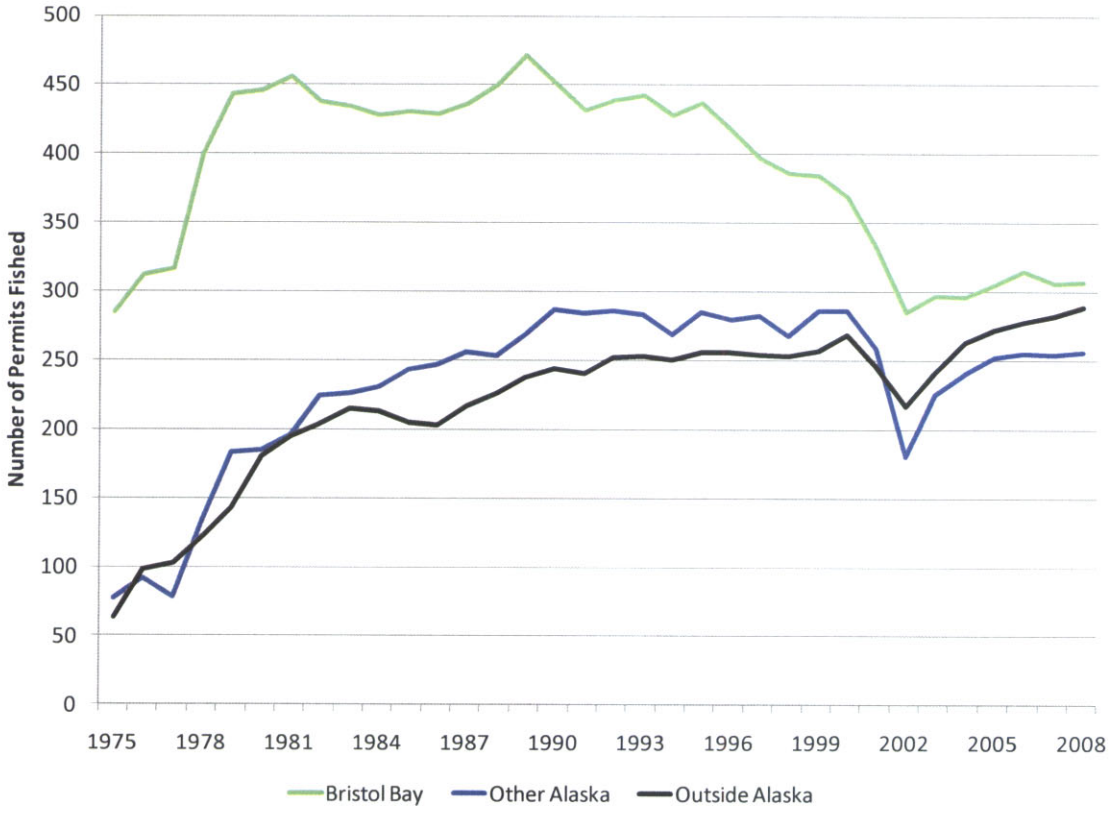
Figure 63. No. of Set Gillnet Permits Held By Residence within the Bristol Bay Watershed, 1980 - 2008



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

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.

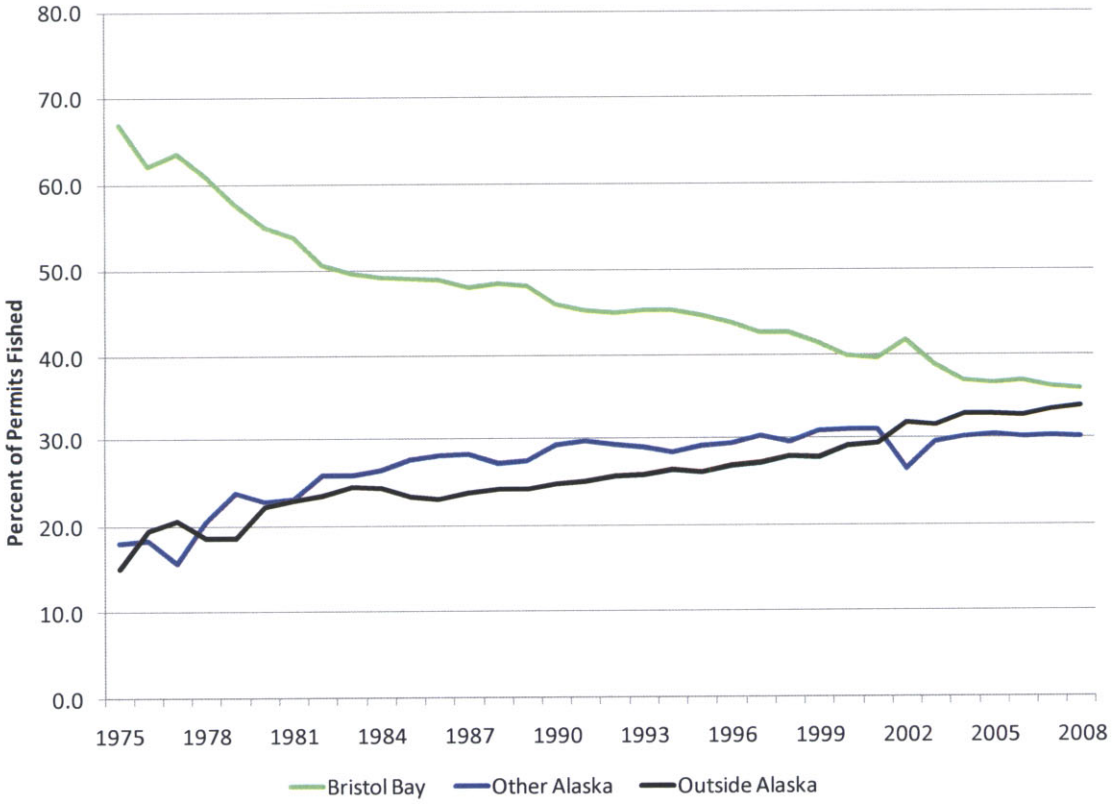
Figure 64. Number of Set Gillnet Permits Fished By Residence, 1975 - 2008



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

While the decline in the number of set net permits owned by watershed residents has stabilized in recent years, watershed participation as a percentage of permits fished continues its decline as outside residents participate at a higher rate. If current trends continue, permit holders from outside Alaska will surpass watershed residents as the largest group fishing their permits. So, while watershed residents may hold a numerical superiority in terms of numbers of permits owned, permit holders from outside Alaska are likely to become the largest group fishing in the next two to three years.

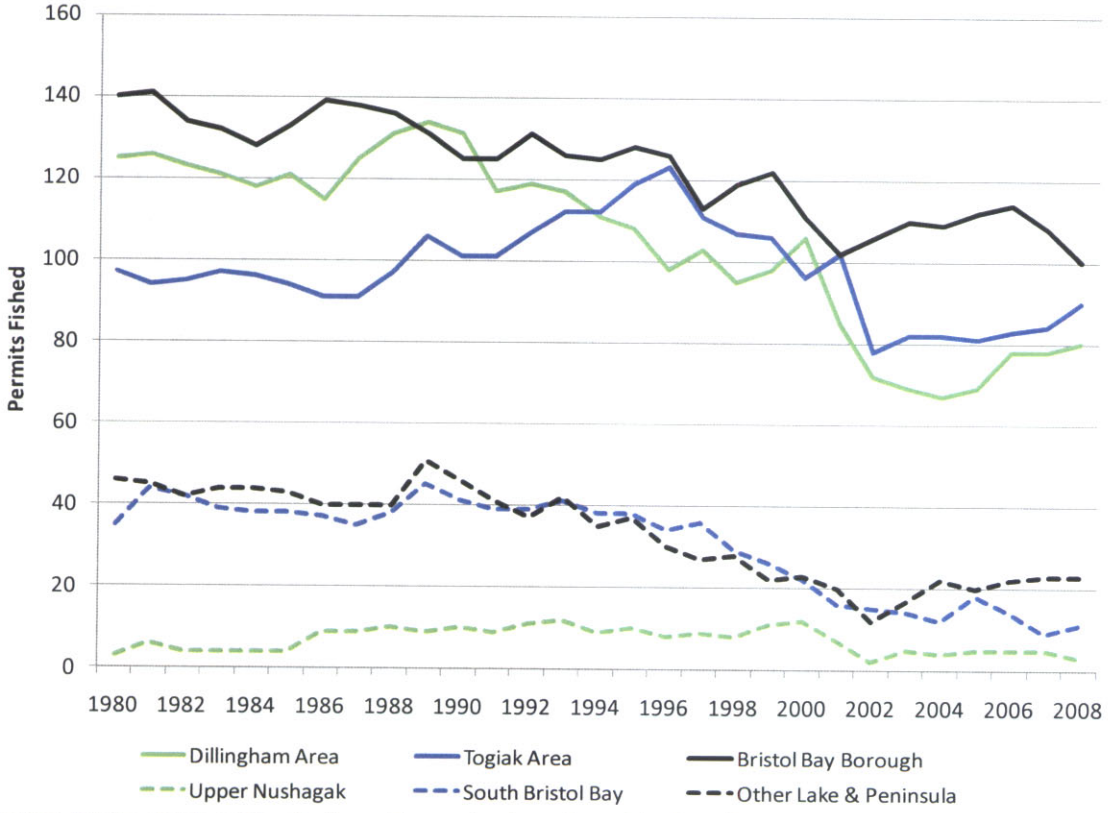
Figure 65. Percent of Set Gillnet Permits Fished By Residence, 1975 - 2008



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

The CFEC data show that the number of set net permits has declined the most in the BBB and the Dillingham areas, with a drop from 140 permits in 1980 to 100 permits in 2008 for the BBB and a drop from 120+ permits in 1980 to roughly 80 permits in the Dillingham area. By comparison, the number of permits in the Togiak is steady since 2002 even though there was been significant decline in that area in the late 1990s. On a percentage basis, the South Bristol Bay and Other Lake & Peninsula areas have lost the most; each of these areas has nearly 50 percent fewer permits than it did in 1980. The Upper Nushagak area has roughly the same number of permits it had in 1980, but fewer than it had in 1990.

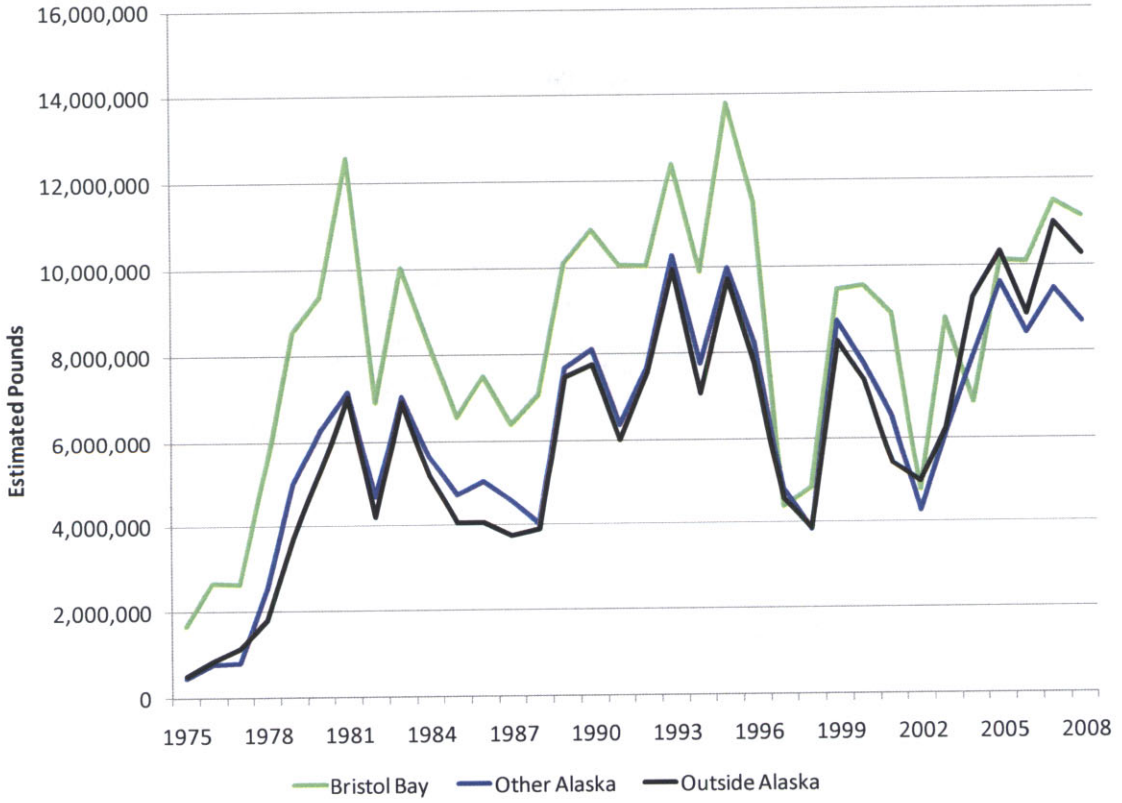
Figure 66. No. of Set Gillnet Permits Fished By Residence within the Bristol Bay Watershed, 1980 - 2008



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

The trends in total pounds harvested by permit holder region of residence reflect the participation data previously discussed in this analysis.For a long time, watershed residents have held an edge in terms of total pounds harvest, but over the last decade that edge has evaporated; eroded by the loss of permits and lower participation rates.

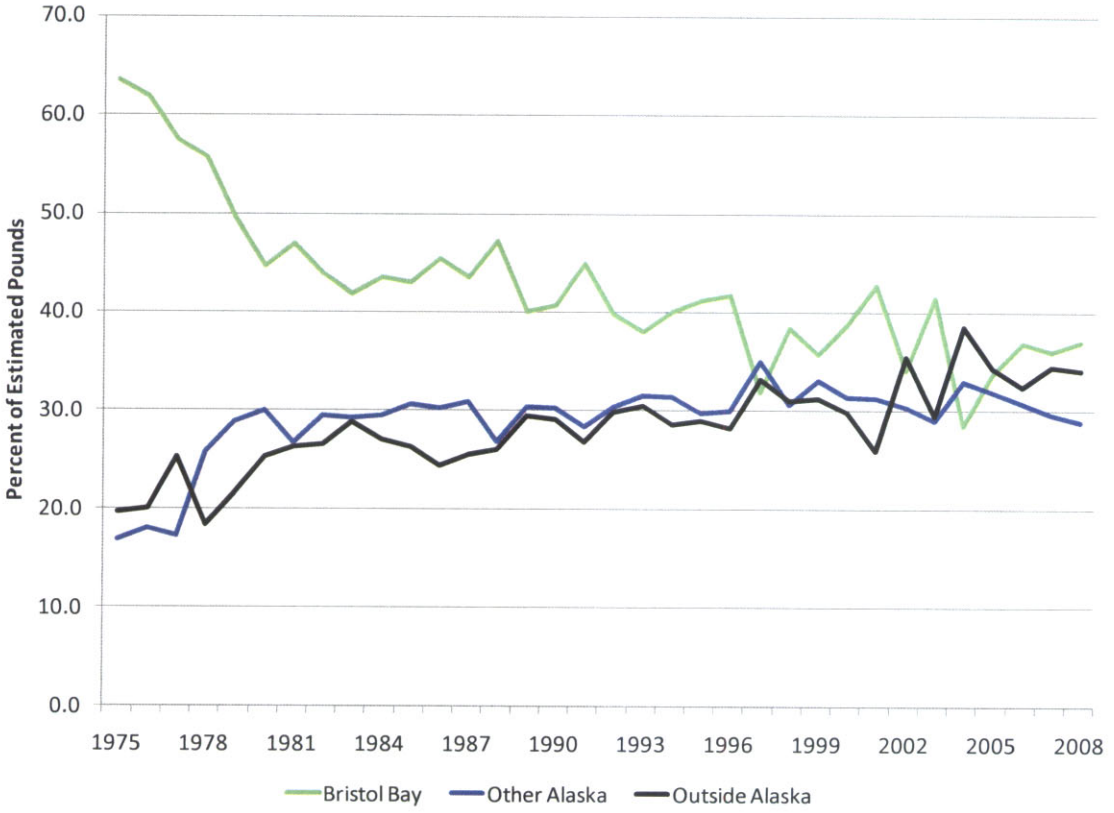
Figure 67. Total Pounds Harvested in the Set Gillnet Fishery by Residence, 1975 - 2008



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

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.

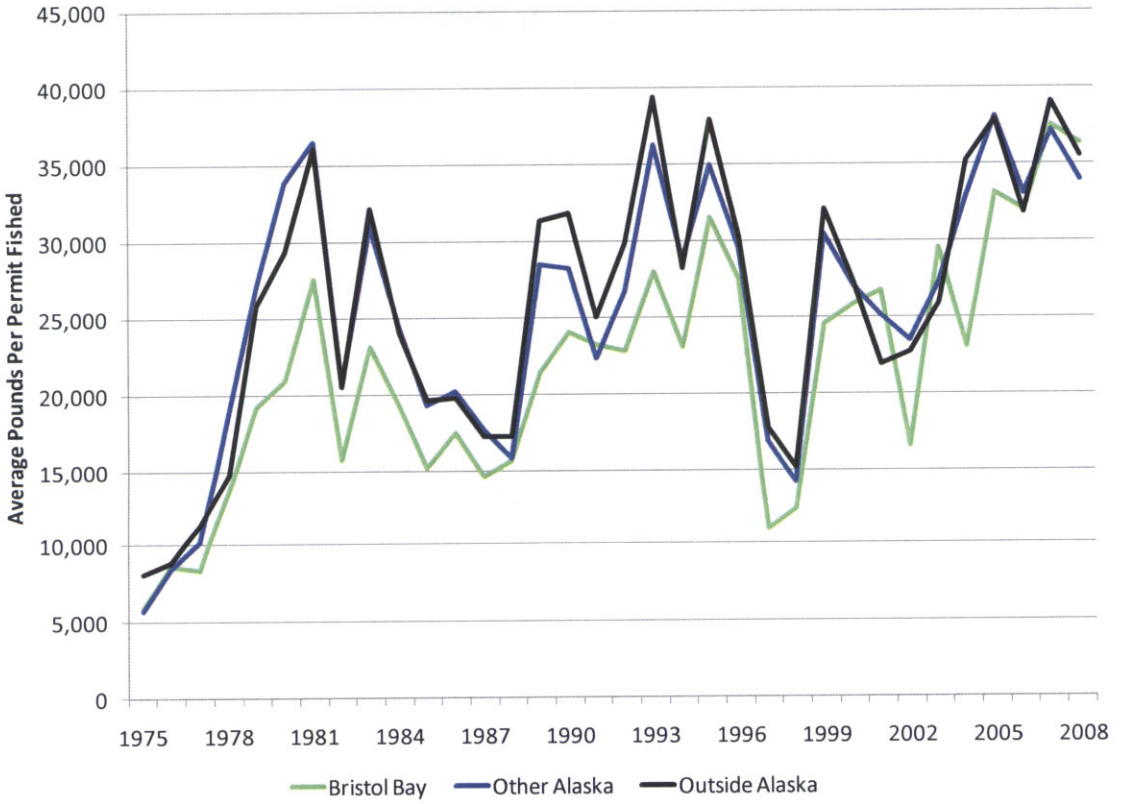
Figure 68. Percent of Total Pounds Harvested in the Set Gillnet Fishery by Residence, 1975 - 2008



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.

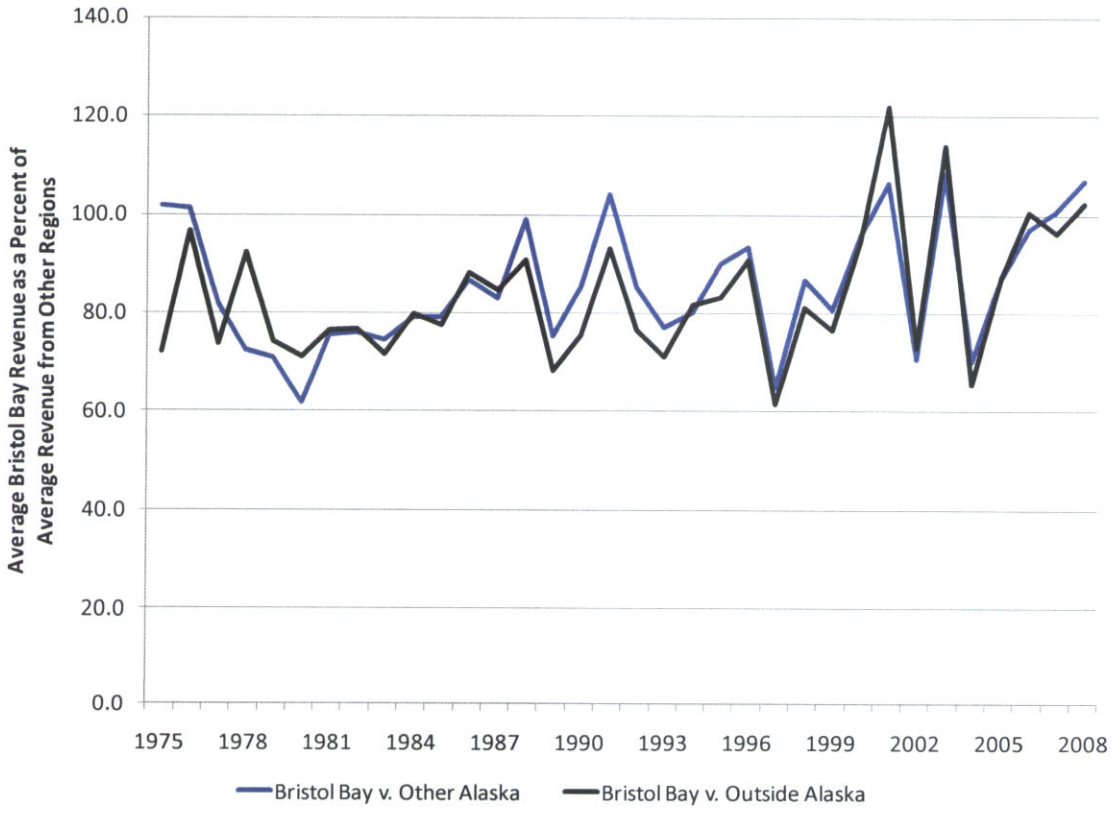
Figure 69. Average Pounds per Permit Fished in the Set Gillnet Fishery by Residence, 1975 - 2008



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.

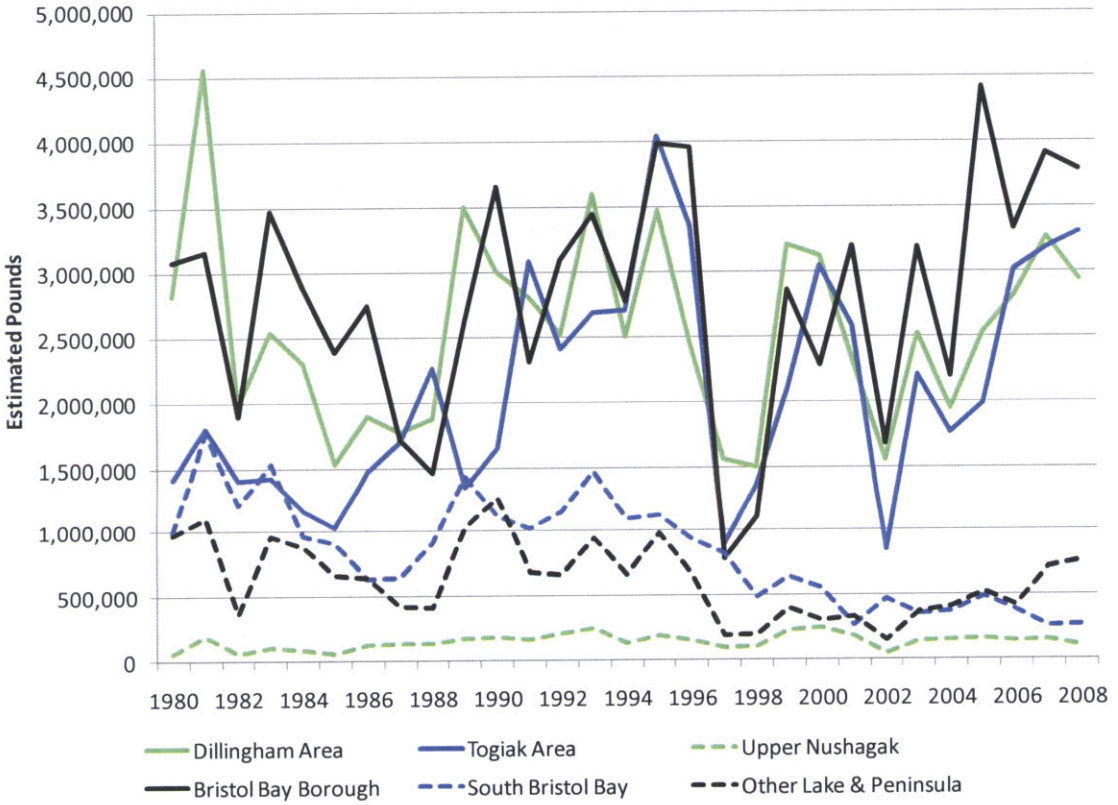
Figure 70. Average Lbs / Permit by Watershed Residents as a Percent of Average Lbs per Permit of Other Regions, 1975 - 2008



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

The total pounds harvested by region reflects the regional origin of the permit holders with the top three groups in terms of pounds harvested corresponding to the top three groups in terms of permits fished. The same is true of the bottom three groups.

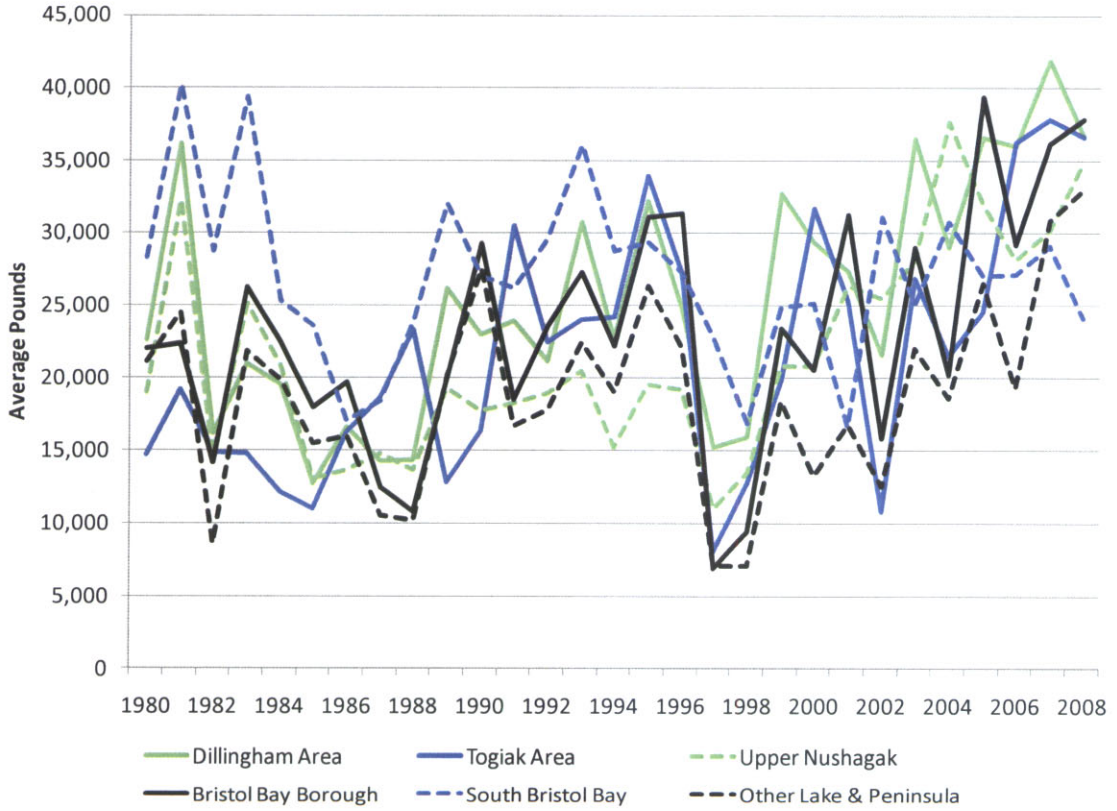
Figure 71. Total Pounds Harvested in the Set Gillnet Fishery by Watershed Residents, 1980 - 2008



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

The relative performance of set net permit holders by area sub-group changes with the relative run strength of the river system where the permit holder fishes. As set net permit holders tend to fish the same site year-over-year, the relative performance is dependent on the run size for their particular river system. For example, in the last several years, BBB permit holders have moved from harvesting middle-of-the-pack amounts on average to harvesting better than average amounts per permit.This change likely reflects the resurgence of the Kvichak River runs, which are most accessible to BBB permits.

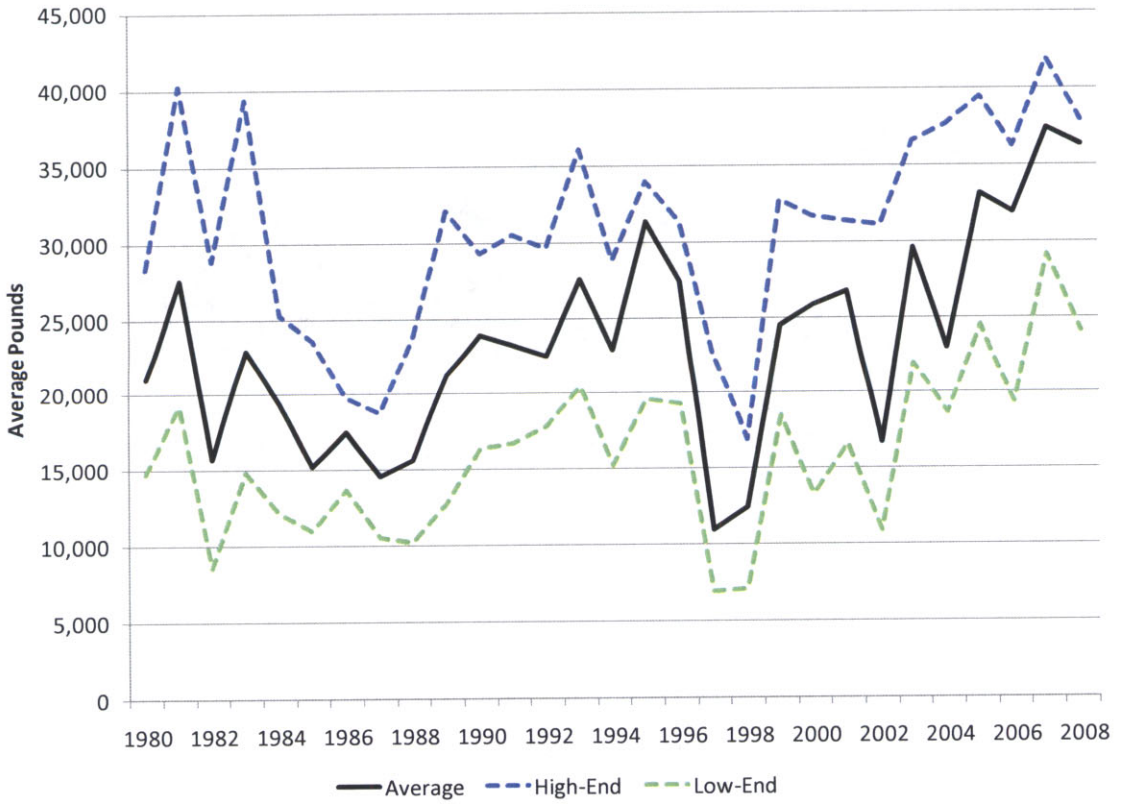
Figure 72. Average Lbs. Harvested / Permit in the Set Gillnet Fishery by Watershed Residents, 1980 - 2008



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

This figure is developed using the highest and lowest average pounds per permit by residence group for the year (as seen in the previous figure) and the average pound per permit over all watershed residents. The difference between the high-end and low-end range for the average pounds caught per permit holder is less for set net permit holders than it is for drift net permit holders. While high-end drift net permit holders can harvest twice the low-end average, in recent years high-end set net permit holders have harvested roughly 60 percent more than the low-end average and only ten to twenty percent more than the average for all groups.

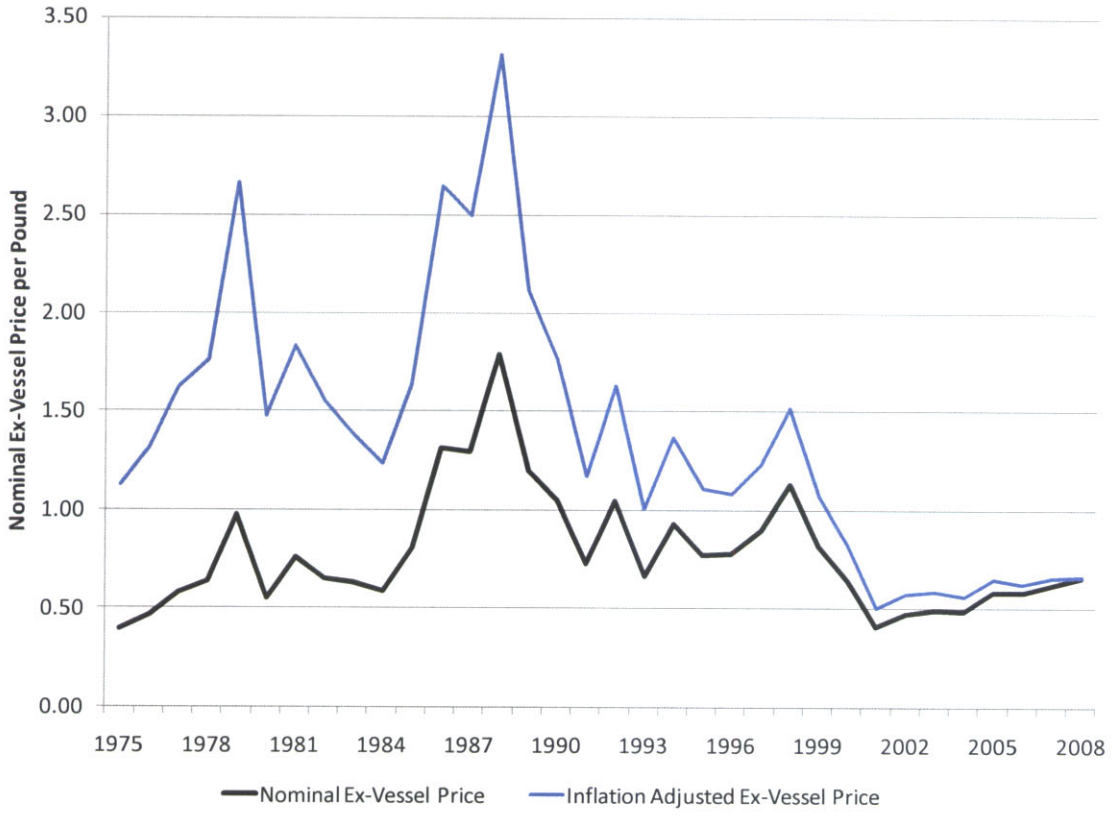
Figure 73. Range of Average Pounds per Permit by Various Regions within the Watershed, 1980 - 2008



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

As with average ex-vessel prices in the drift net fleet, the average price per pound paid in the set net fleet continues to sit near historic lows once past prices are adjusted for inflation.

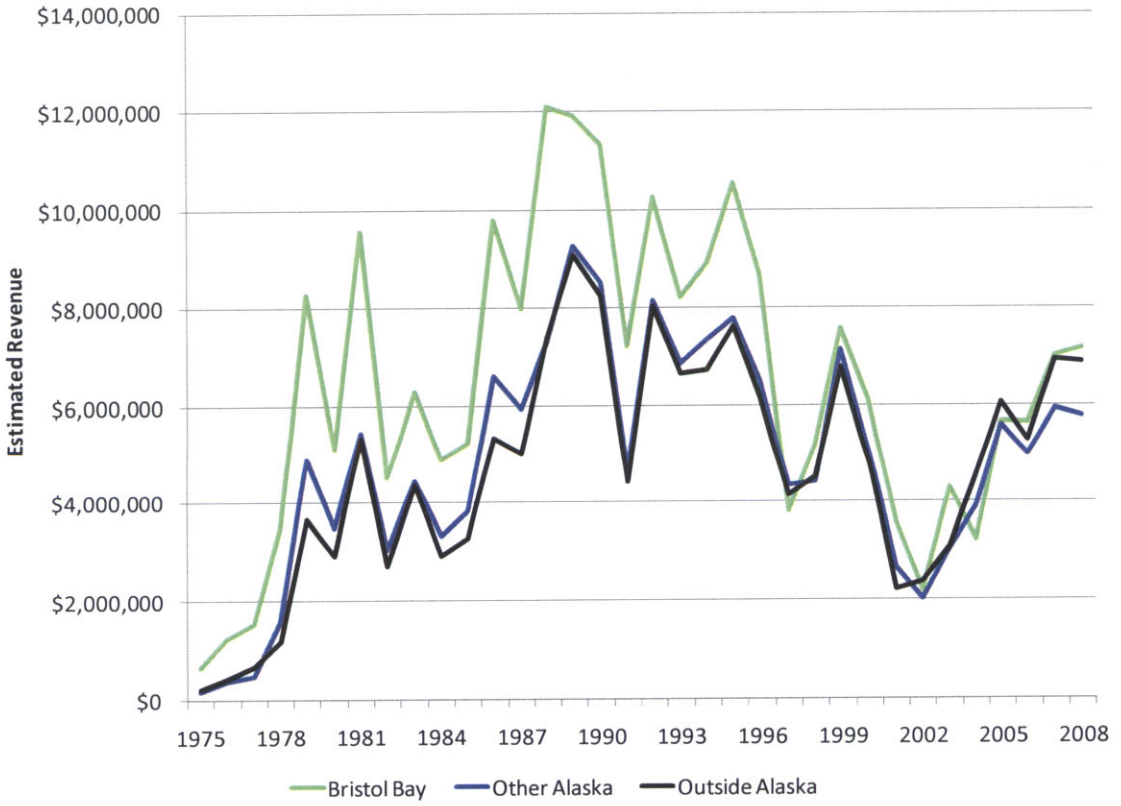
Figure 74. Average Ex-Vessel Price per Pound in the Set Gillnet Fishery, 1975 – 2008



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

Total revenue within the set net fishery by region of origin is not roughly equally divided between watershed residents, residents from other areas in Alaska, and permit holders from outside of Alaska. If participation by watershed residents continues to drop, we would expect to see the permit holders from outside of Alaska grow to be the largest group by revenue.

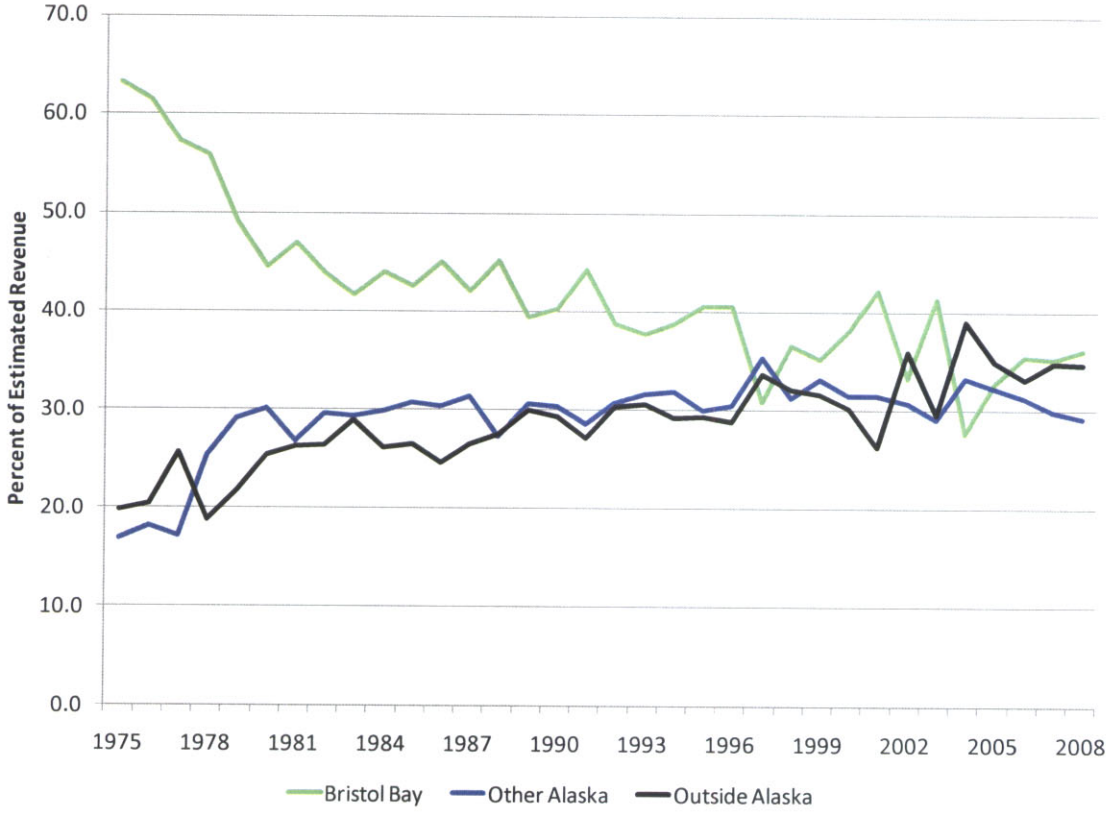
Figure 75. Total Revenue in the Set Gillnet Fishery by Residence, 1975 - 2008



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

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.

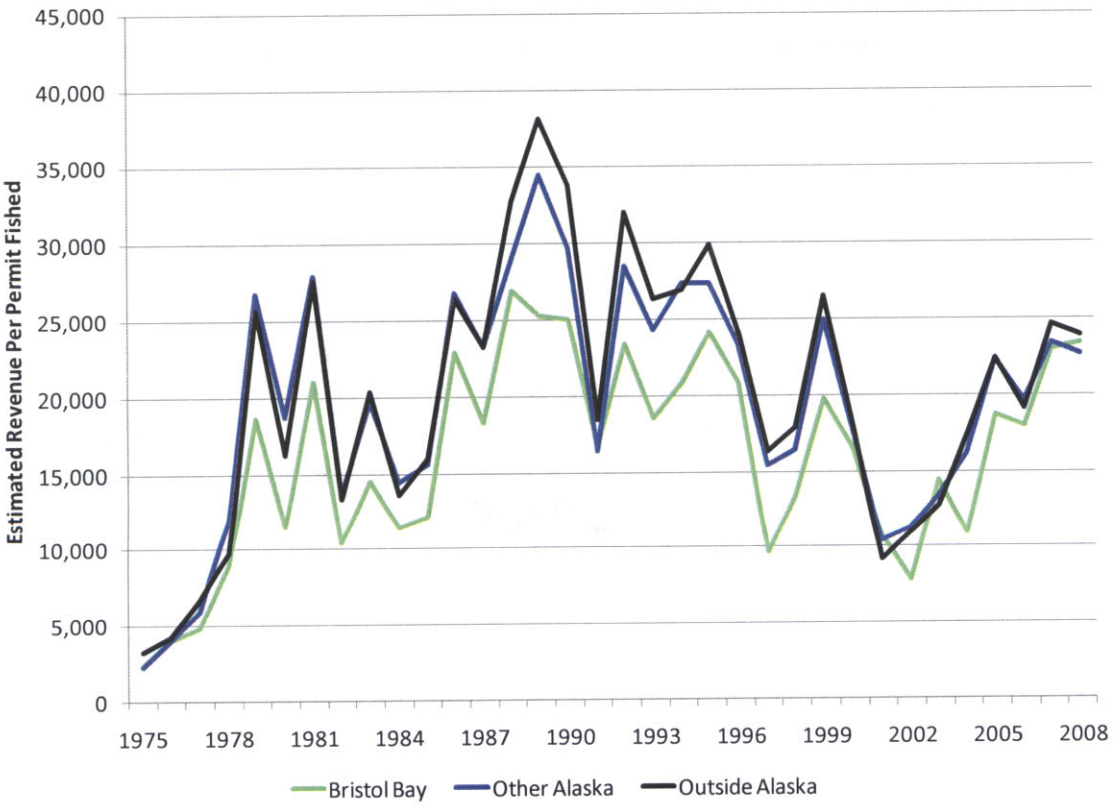
Figure 76. Percent of Total Revenue in the Set Gillnet Fishery by Residence, 1975 - 2008



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.

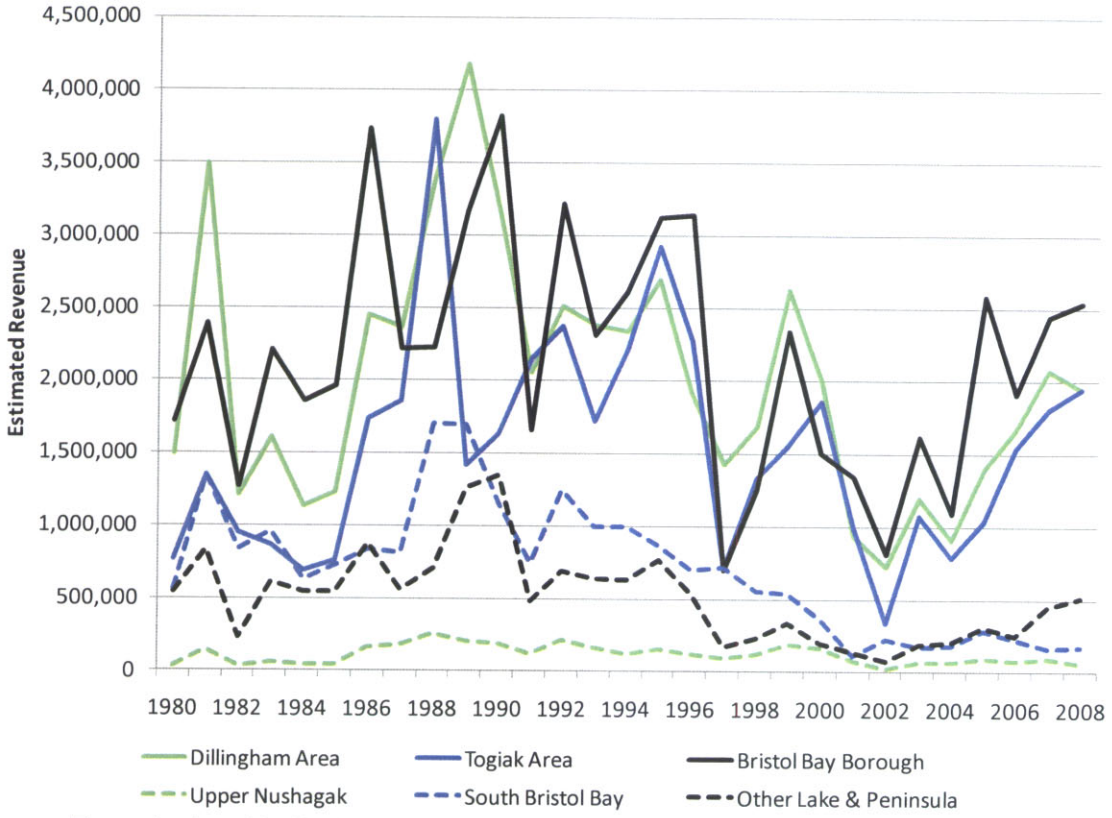
Figure 77. Average Revenue per Permit Fished in the Set Gillnet Fishery by Residence, 1975 - 2008



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

Permit holders from the BBB generate the largest amount of revenues from the set net fishery followed by residents from the Dillingham and Togiak areas. Total revenue for each of these regions has rebounded substantially in recent years as ex-vessel prices have increased and total run size has also increased. Unlike the larger groups, permit holders from the South Bristol Bay and Upper Nushagak have not seen similar increases in revenue, perhaps because of declining participation.

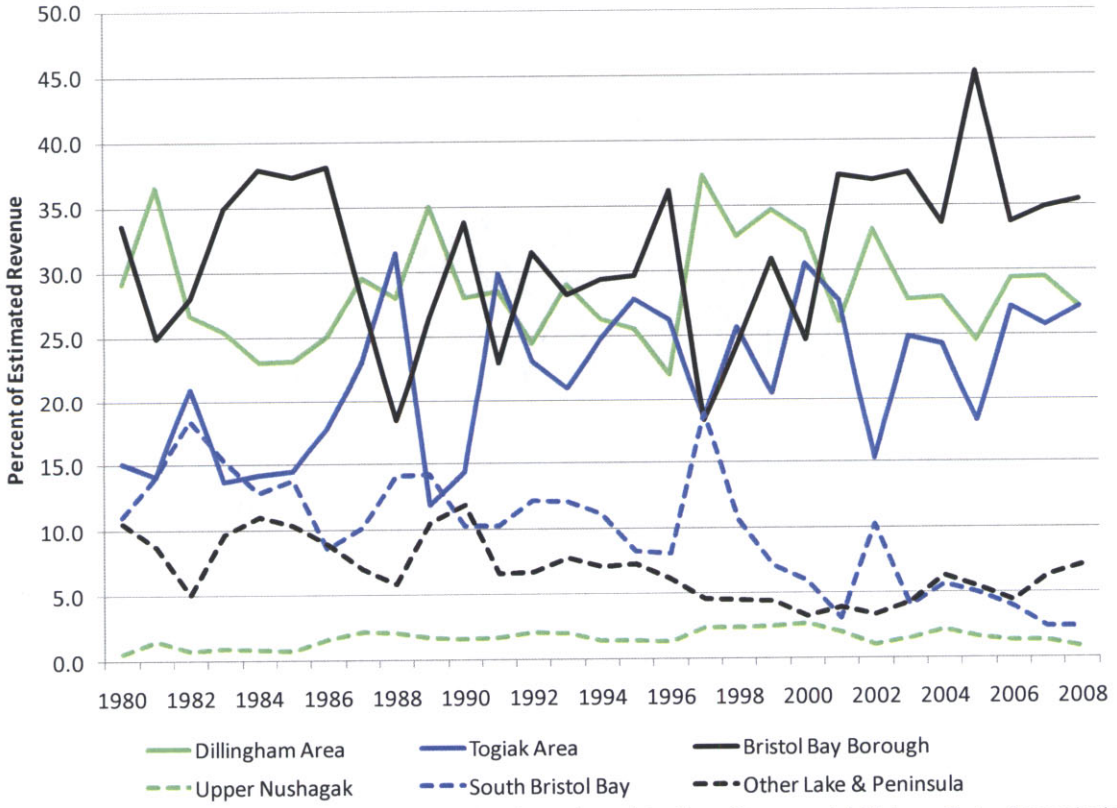
Figure 78. Total Revenue in the Set Gillnet Fishery by Watershed Residents, 1980 - 2008



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

The data in Figure 79 reflect the trends noted above: the percentage of total revenue attributable to group on the lower end, such as permit holders from the Upper Nushagak and South Bristol Bay has declined in recent years, while the percentage attributable to residence groups in Dillingham, Bristol Bay Borough and Togiak appear to shift on the basis of the health of local river systems. For example, the percentage attributable to the BBB has increased in recent years as the Kvichak river system has shown healthier returns.

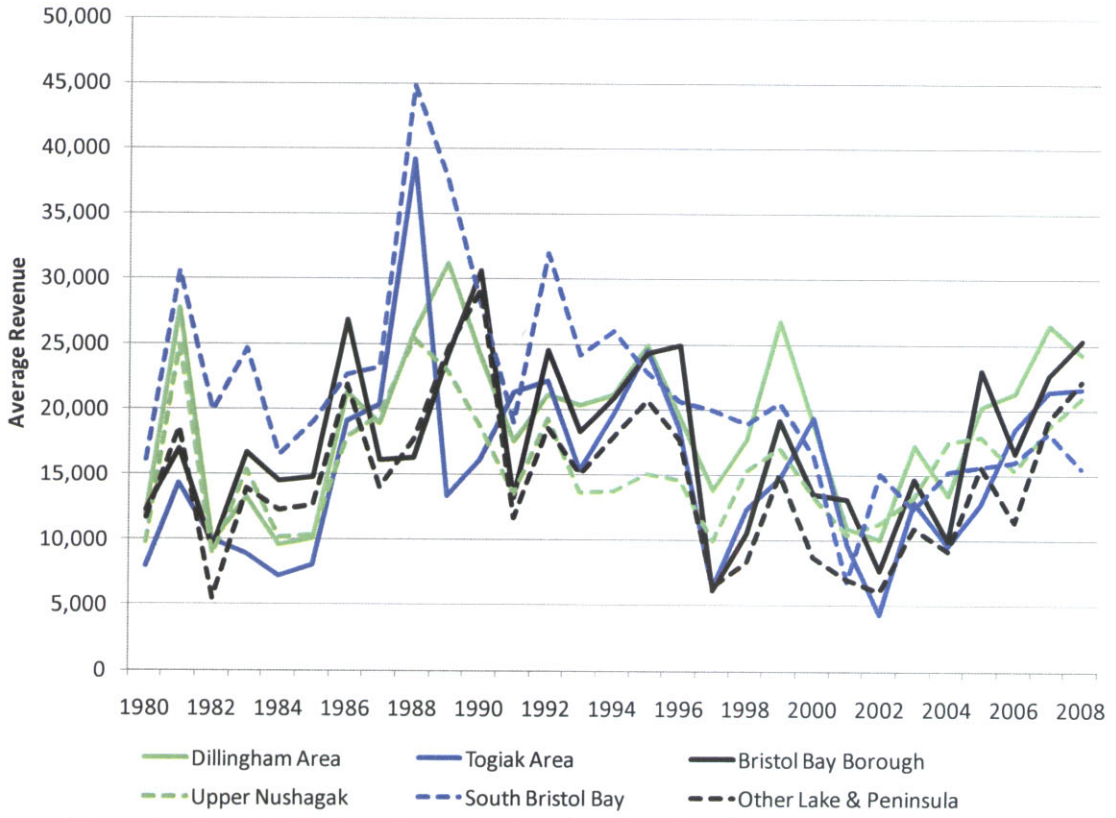
Figure 79. Percent of Total Watershed Revenue in the Set Gillnet Fishery by Area of Residence, 1980 - 2008



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

Average revenue per permit is related to two primary factors: the ex-vessel price per pound and the run size available to each permit holder group. In general, average revenue for permit holders from different areas tends to move up and down together, but the sub-regions may change ordinal position within the watershed. For example, in the late 1980s, the average permit holder from the South Bristol Bay area did the best out of the six groups. In 2008, that group of permit holders did the worst and the group is the only group to not do better on average in 2008 than it did in 2007.

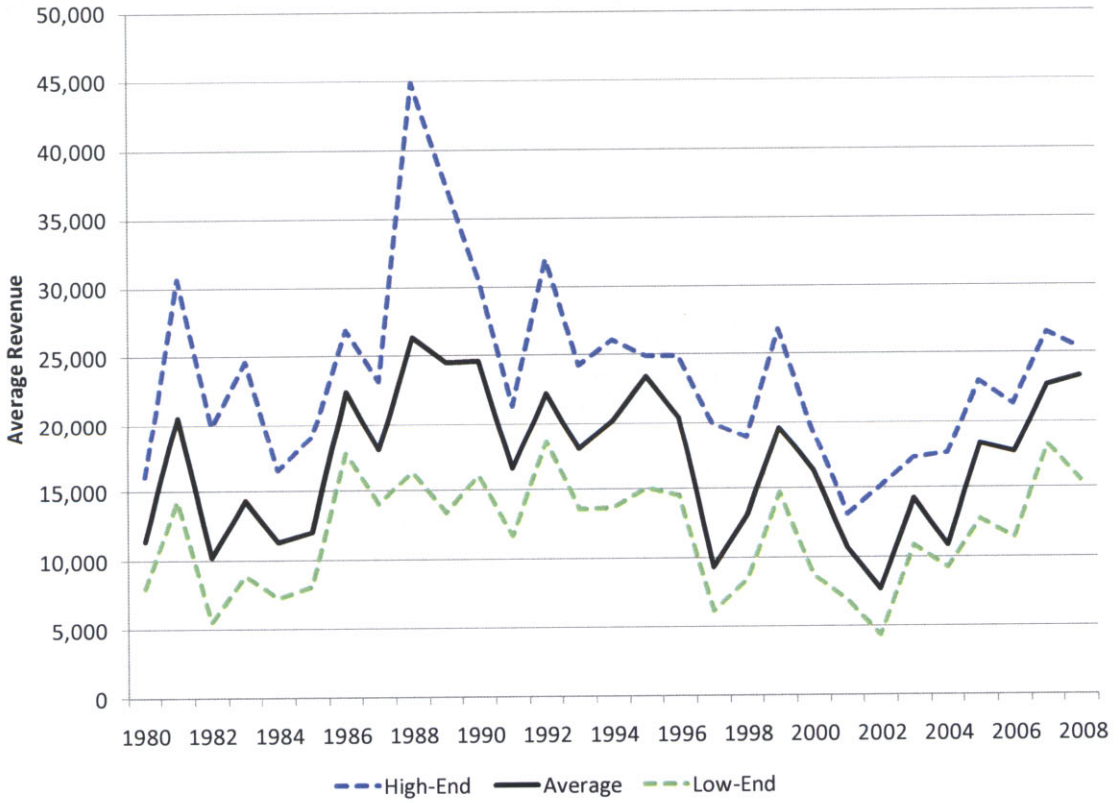
Figure 80. Average Revenue / Permit Fished in the Set Gillnet Fishery by Watershed Residents, 1980 - 2008



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

This figure is created by taking the highest and lowest average revenue per set net permit from each of the 6 sub-regions within the watershed. The difference in average revenues for set net permit holders reflects the difference in average pounds per permit holder. On average, these difference are not as pronounced in the set net fishery as they are in the drift net fishery, with high-end permit holders generating revenue that is much closer to average than their high-end drift counterparts.

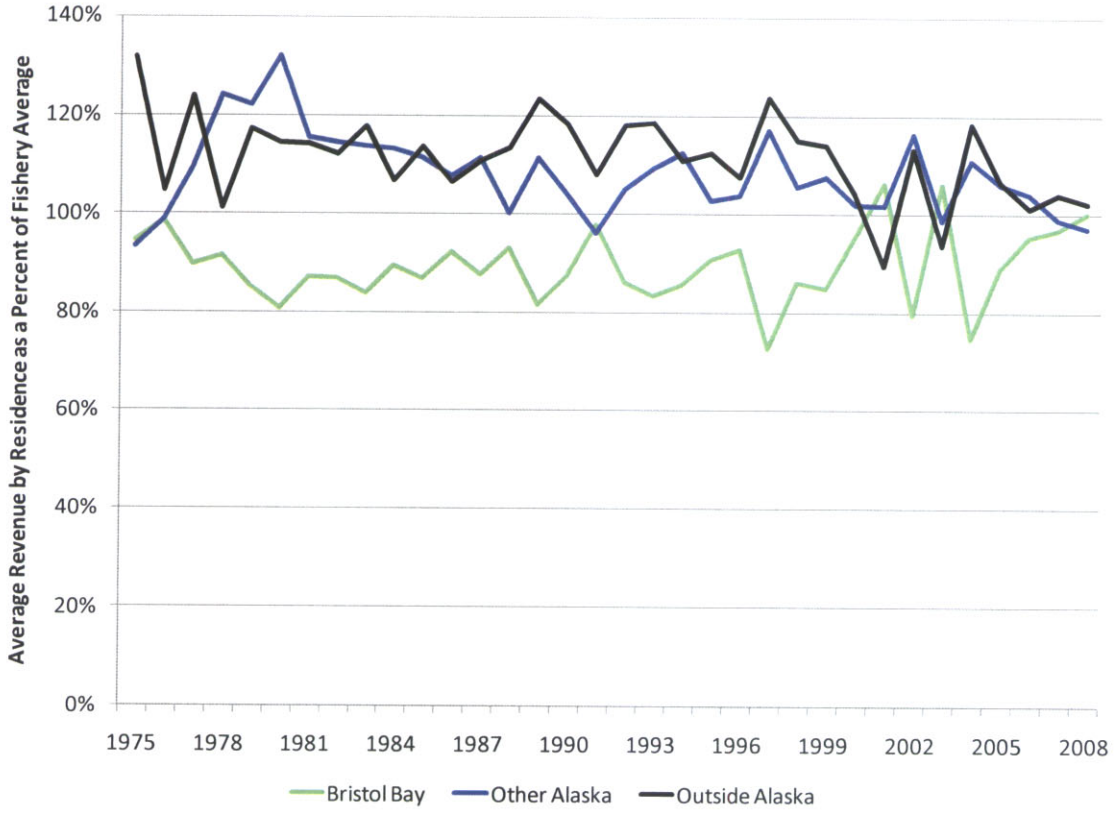
Figure 81. Range of Average Revenues / Set Gillnet Permit by Regions within the Watershed, 1980 - 2008



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

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.

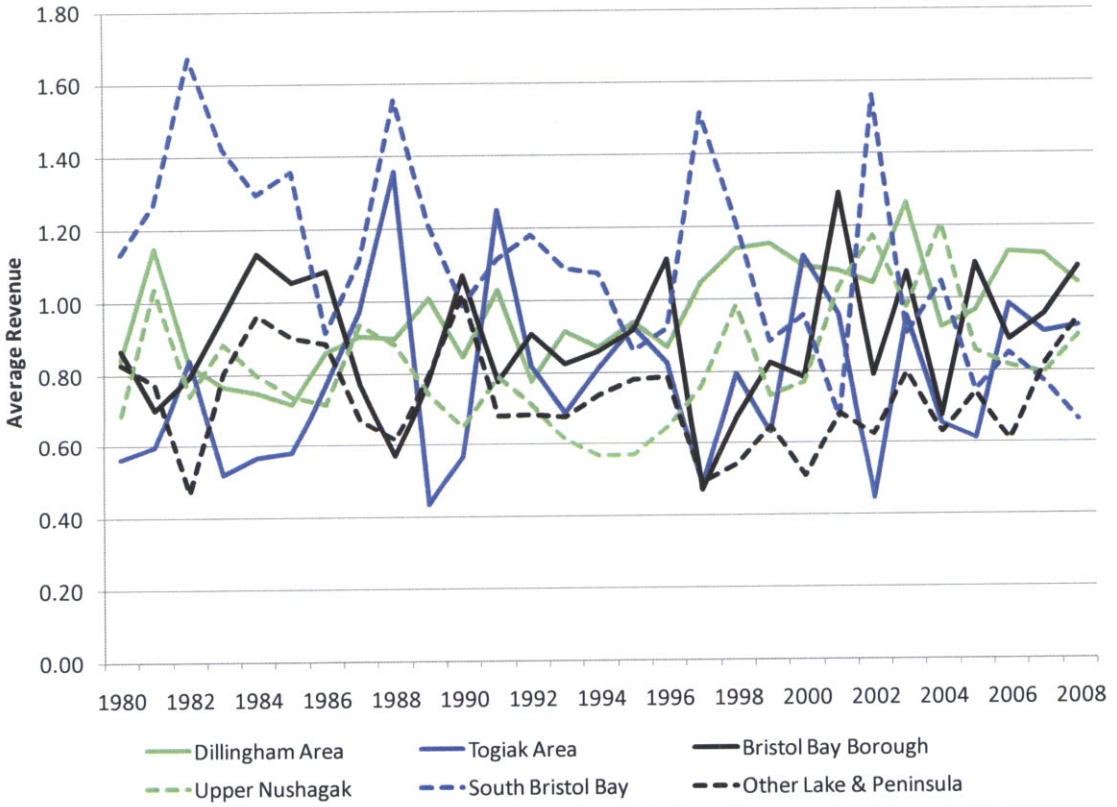
Figure 82. Average Set Gillnet Revenues by Residence as a Percent of Fishery-Wide Average, 1975 - 2008



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

Figure 83 shows that average set gillnet revnues as a percent of overall fishery wide averages are highly variable from group to group and within each group. This range reflects that some groups tend to do better than others (e.g., the South Bristol Bay Group) while some groups tend to do worse than average (e.g., the Other Lake and Peninsula Group). At the same time, relative performance varies widely from year-to-year, likely as a function of local run size and strength.

Figure 83. Average Set Gillnet Revenues in the Watershed as a Percent of Fishery-Wide Average, 1980 - 2008

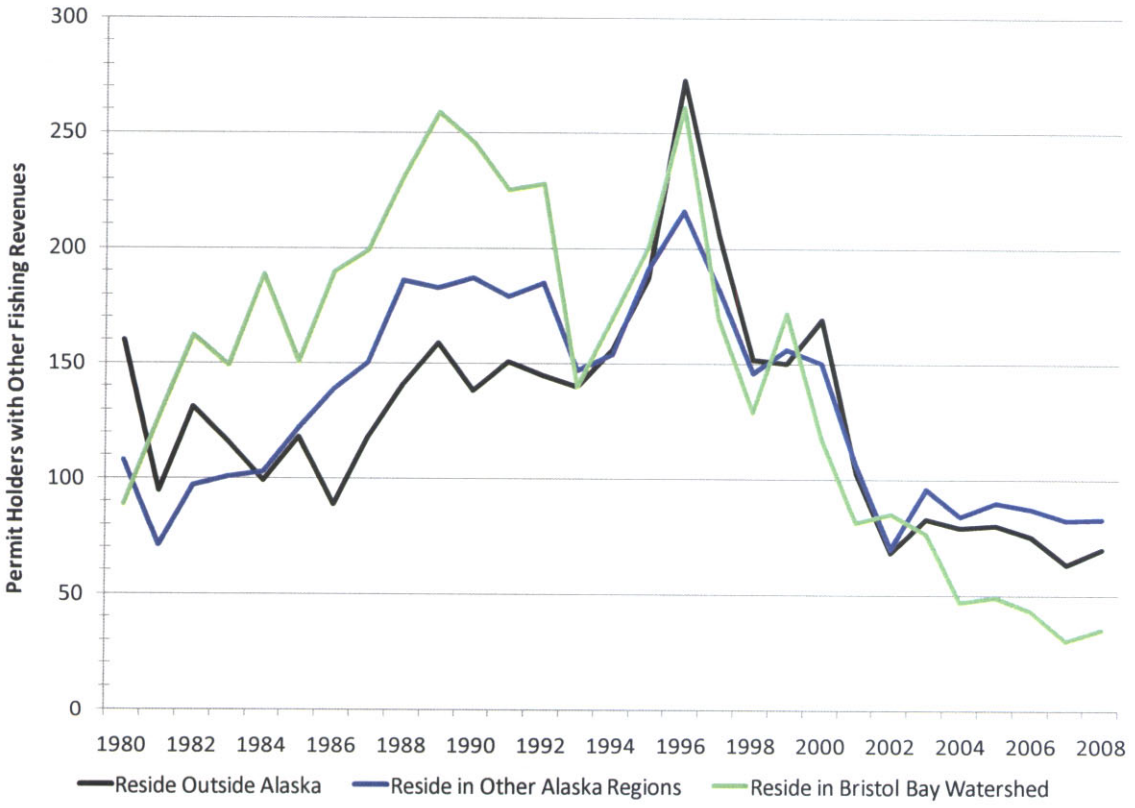


Source: Figure developed by Northern Economics based on data from Commercial Fishery Entry Commission (CFEC, 1980 - 2008).

8 Bristol Bay Permit Holders with Other Fishery or Wage/Salary Revenue

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.

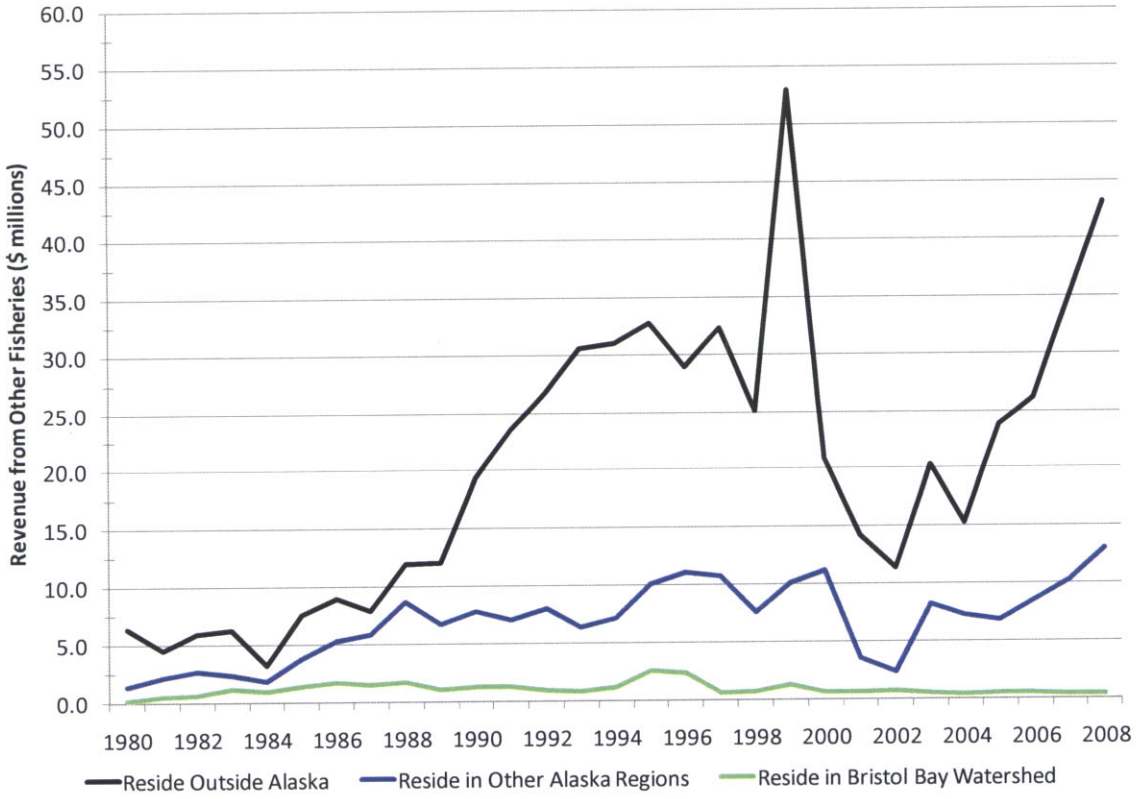
Figure 84. Bristol Bay Salmon Permit Holders with Revenue in Other Fisheries by Residence, 1980 - 2008



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.

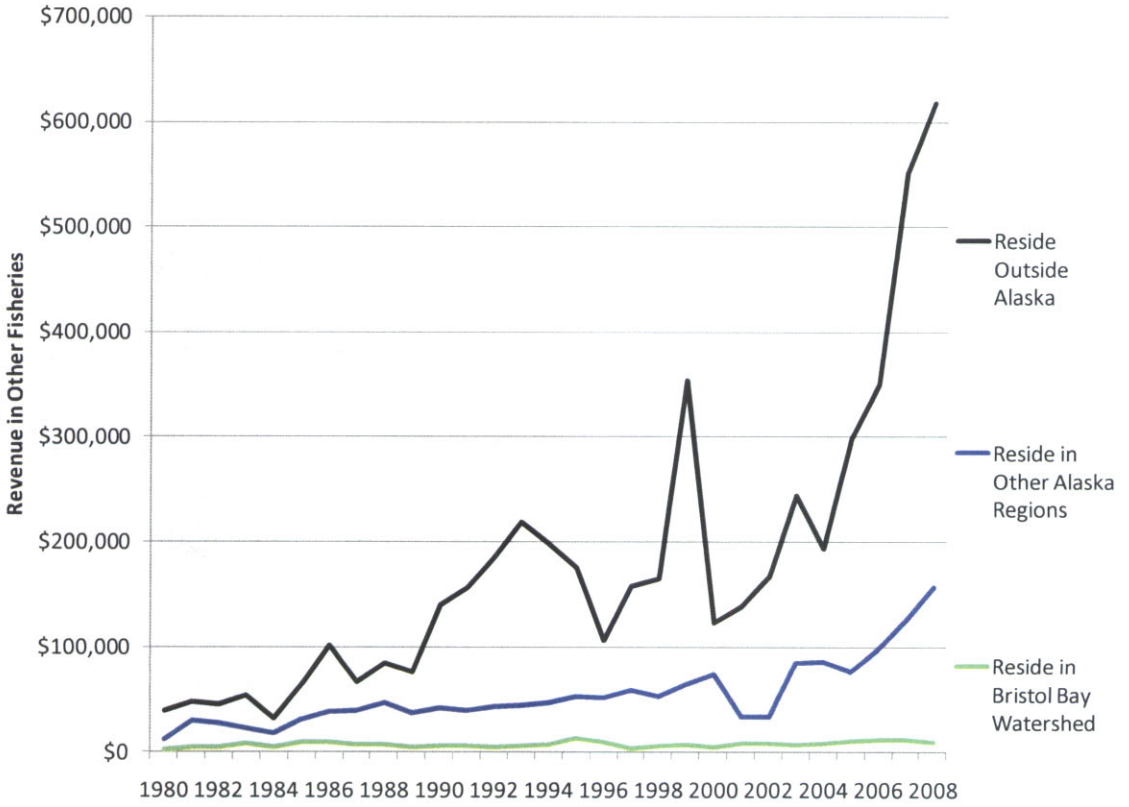
Figure 85. Revenue of Bristol Bay Salmon Permit Holders in Other Fisheries by Residence, 1980 - 2008



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.

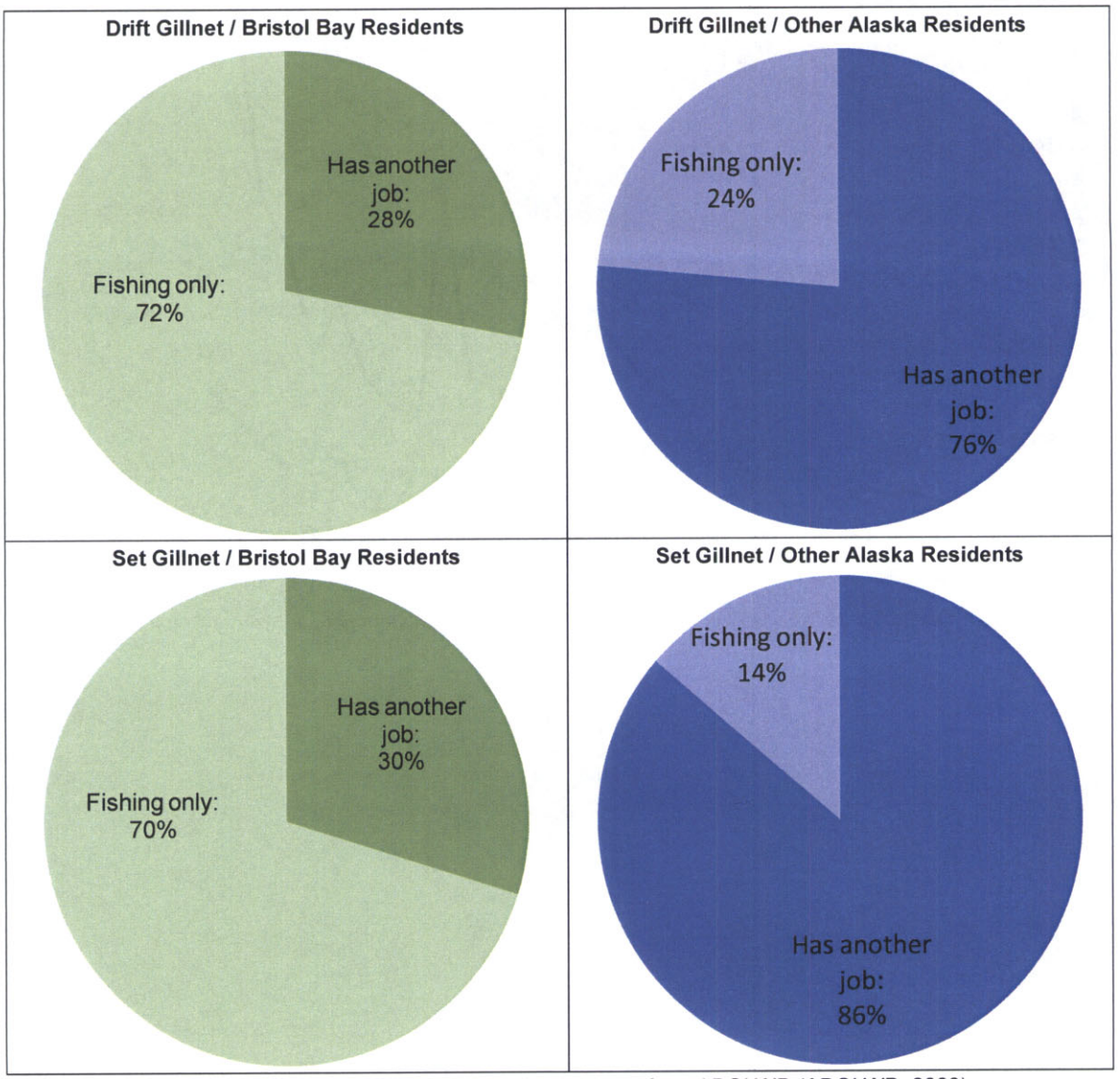
Figure 86. Average Revenue of Bristol Bay Permit Holders in Other Fisheries by Residence, 1980 - 2008



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 87. Wage and Salary Employment of Drift and Set Gillnetter Residing in Alaska, 2006

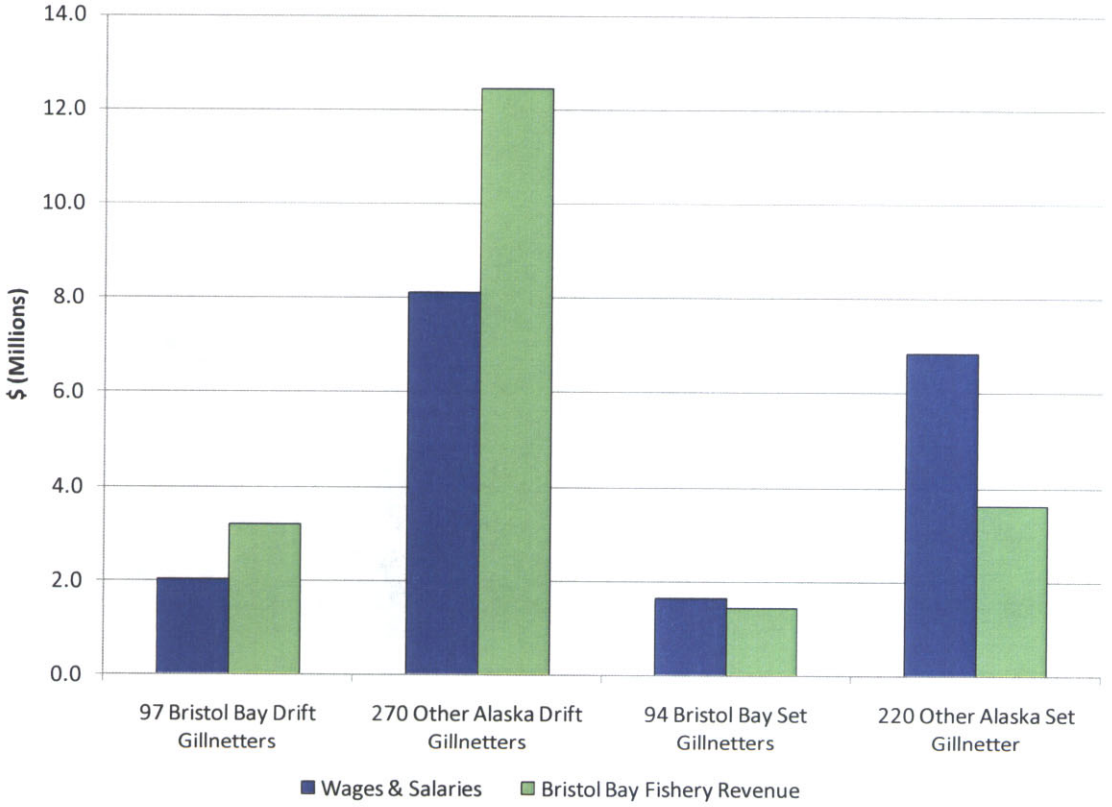


Source: Figure developed by Northern Economics based on data from ADOLWD (ADOLWD, 2009).

The wage and salary data show that in aggregate, both set net permit holders from the watershed and those from outside the watershed generate more revenue from other forms of employment than they do from participation in the Bristol Bay fishery. This fact is particularly true for those outside the region. That said, in both cases, the Bristol Bay fishery represents a substantial portion of the total income generated for these permit holders.

Drift net permit holders from both inside and outside the watershed generate more income from the Bristol Bay fishery than they do from wage and salary jobs outside the fishery.

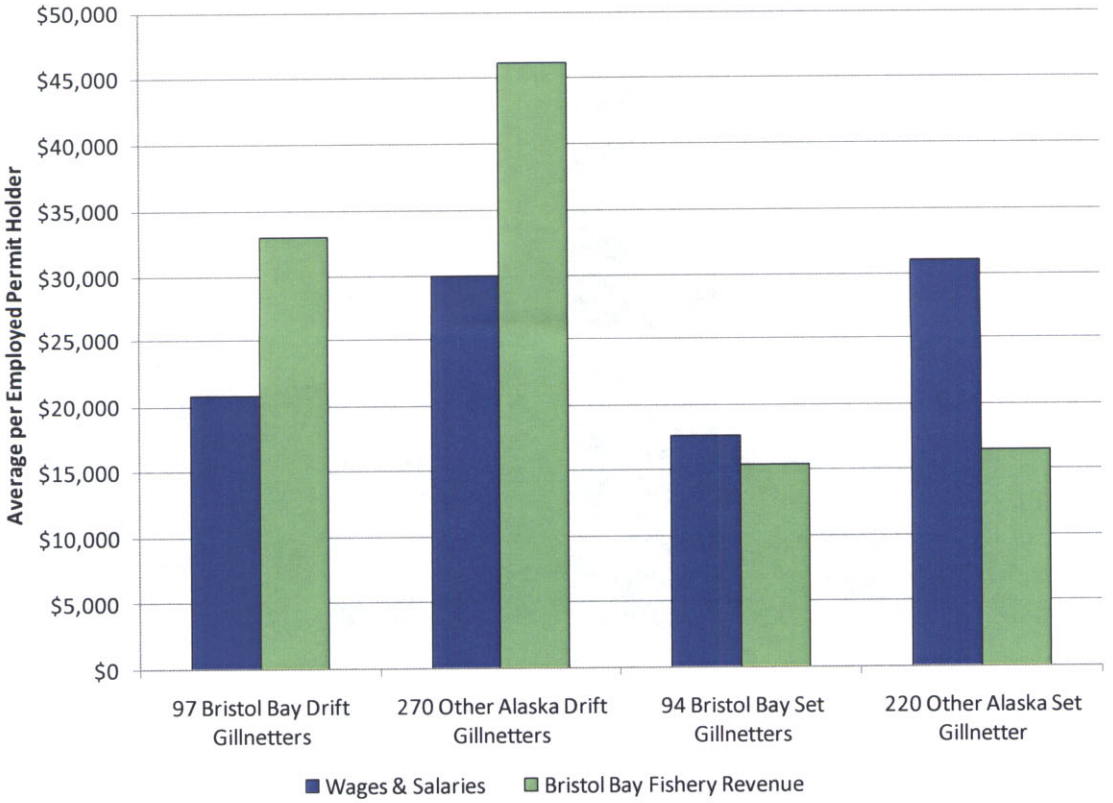
Figure 88. Income and Revenues of Alaska Resident Permit Holders in Bristol Bay Fisheries with Other Wage/Salary Employment, 2006



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

In general, gillnetters with other jobs had gross fishery revenues that were about one-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 89. Average 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).

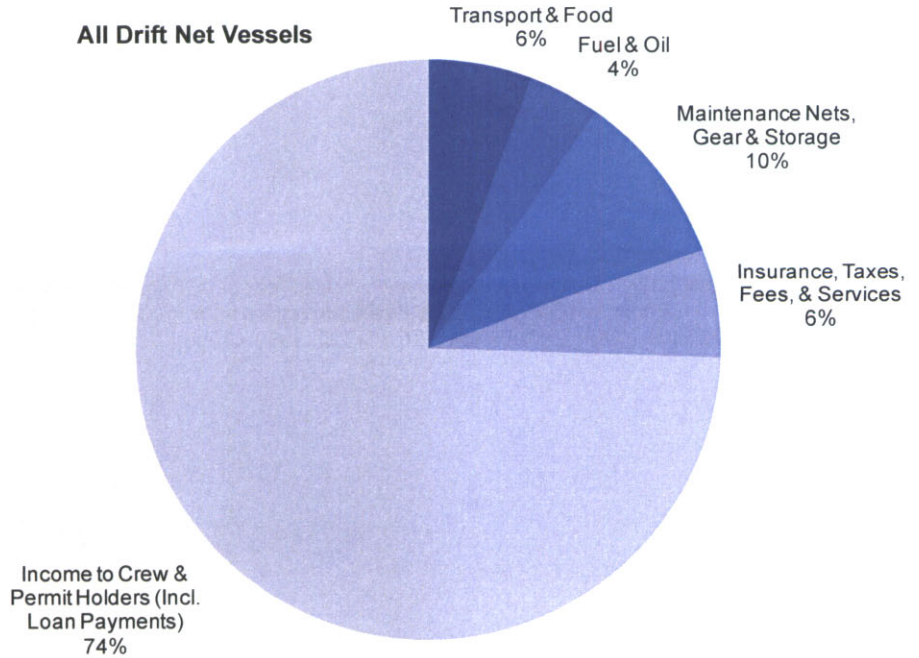
9 Operating Costs in the Bristol Bay Salmon Fisheries

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 Economic 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 90. Breakdown of Drift Gillnet Operating Costs and Incomes to Crew and Permit Holders for 2008

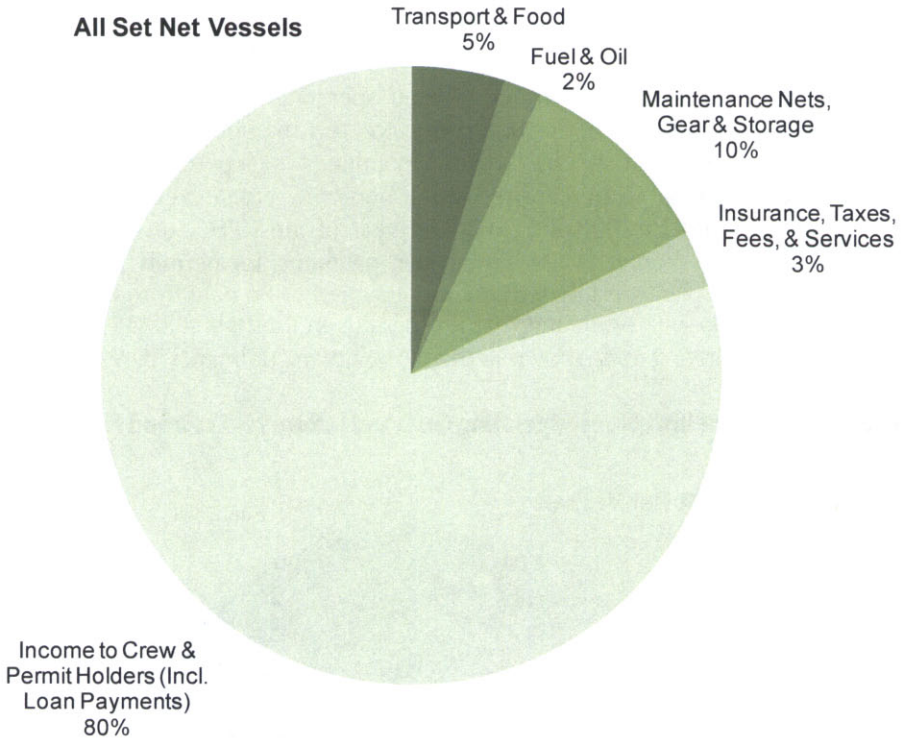


Source: Figure and data developed by Northern Economics based on data originally from CFEC (CFEC, 2002) as well as information from AEA (AEA, 1988 - 2009), US Bureau of Labor Statistics (US BLS, 1980 - 2008) and CFEC (CFEC, 1980 - 2008).

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.

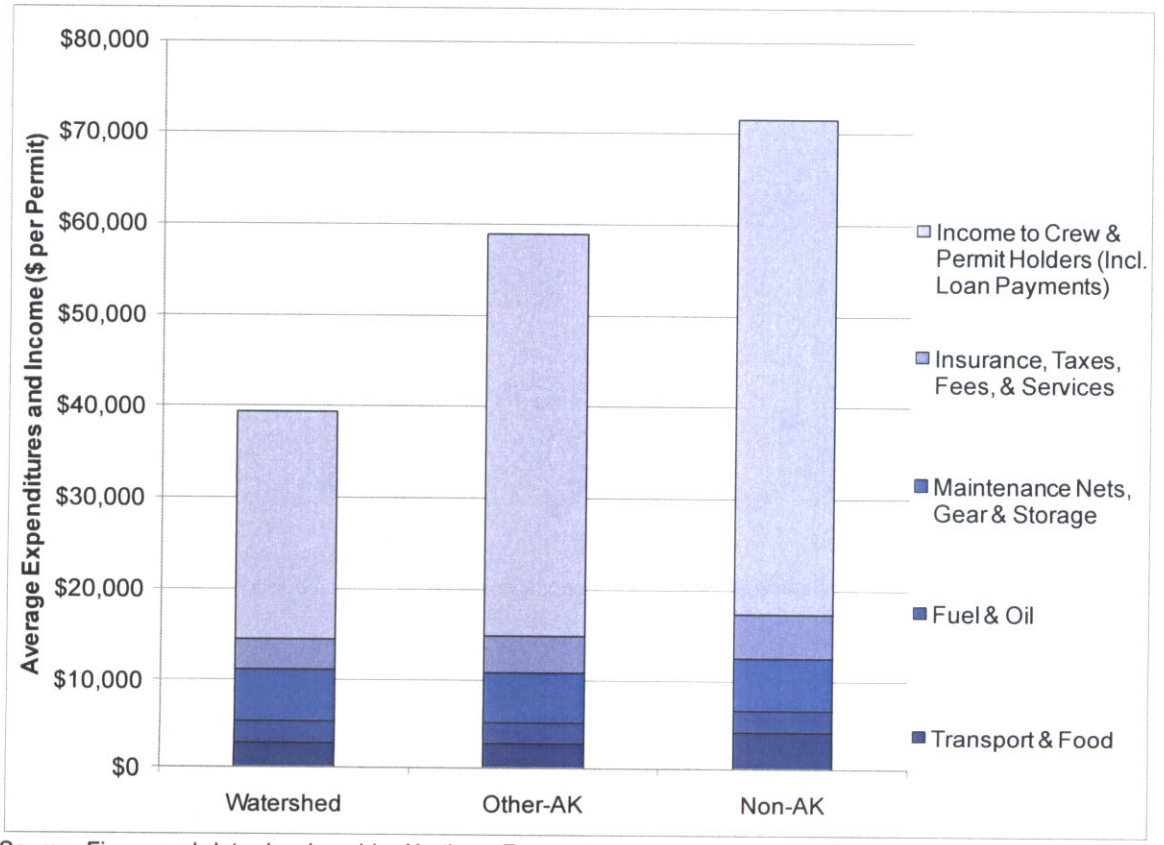
Figure 91. Breakdown of Set Gillnet Operating Costs and Incomes to Crew and Permit Holders for 2008



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).

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).

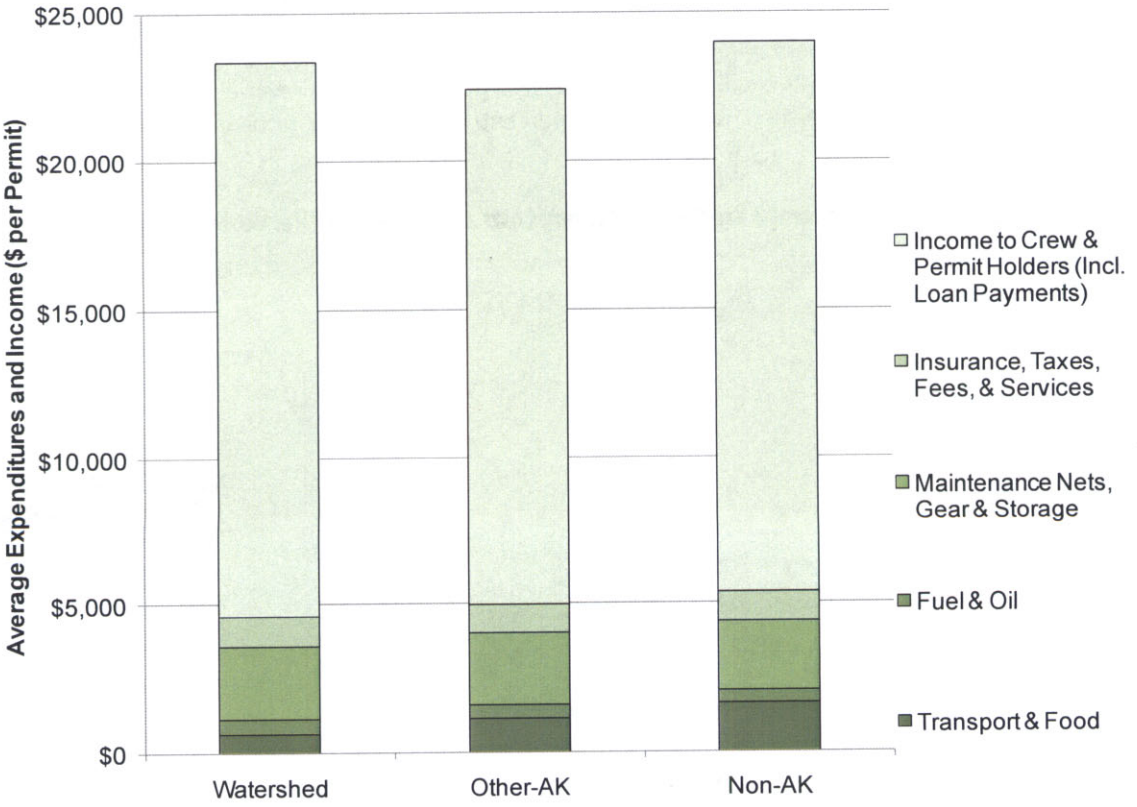
Figure 92. Estimated Average Drift Gillnet Fishery Costs and Income per Permit by Region, 2008



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 93. 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).