

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

Prepared for: **Bristol Bay Economic Development Corporation**

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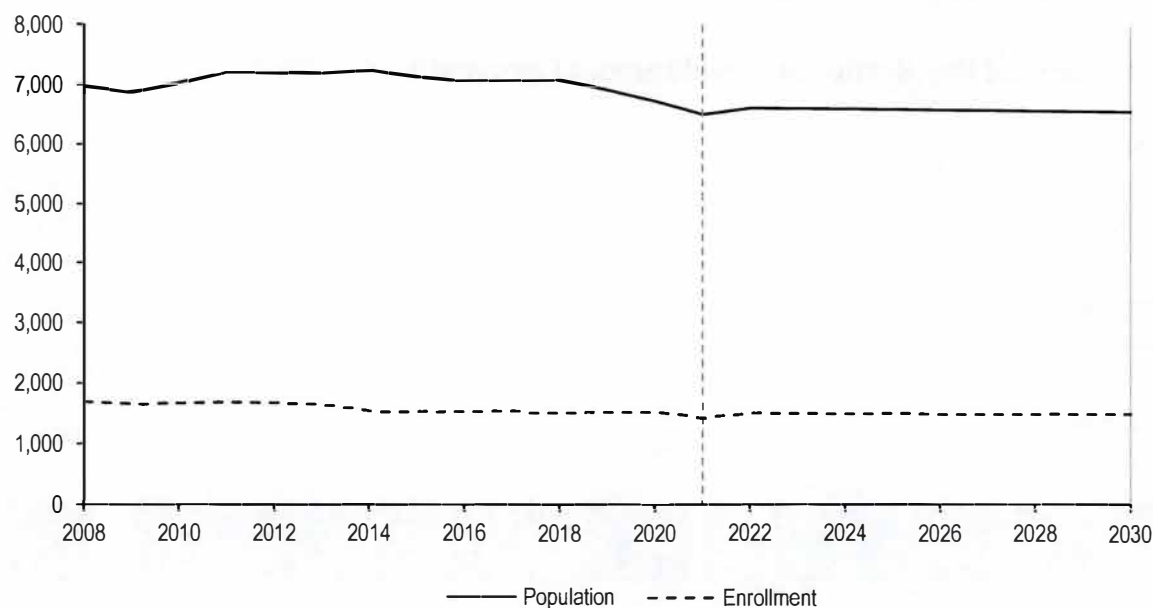
## Executive Summary

Northern Economics was hired by Bristol Bay Economic Development Corporation (BBEDC) in the fall of 2021 to update its report on the importance of salmon to Bristol Bay (Northern Economics, 2009 and 2012). The current report seeks to update information up until 2020, or the most recent year that fishery and other socioeconomic data are available. In some cases, content has changed from the previous reports since data availability has changed over time, most notably with respect to cost of living and estimated operating costs, or elsewhere as noted. Here we summarize primary findings within each main section.

### Population and School Enrollment

As of 2021, the entire population of all three Bristol Bay sub-regions was 6,961—a decline from the 2010 census where the population was 7,475 (Table 1). Between 1980 and 2021, the Dillingham Census Area is the only borough or census area to increase in population. Both the Lake and Peninsula Borough and the Bristol Bay Borough have declined over time, though the Lake and Peninsula Borough is projected to slightly increase in population by 2060, whereas the Bristol Bay Borough is expected to continue to decline. Similar to the population trend, school enrollment overall has decreased between 2008 and 2021—from 1,679 to 1,370, or a 18.4 percent decline, compared to a 7 percent decline in population in the same period. Trends at the community level are mixed, with most echoing the declining trend, particularly in larger schools such as the Naknek, Tanalian (Port Alsworth), and Dillingham schools. Dena'ina school (Pedro Bay) closed in 2010 and Egegik school closed in 2014 after their enrollments fell below 10 students. The only school which observed a net increase over the 2008 to 2021 period was the Twin Hills school—which increased from 14 to 20 students.

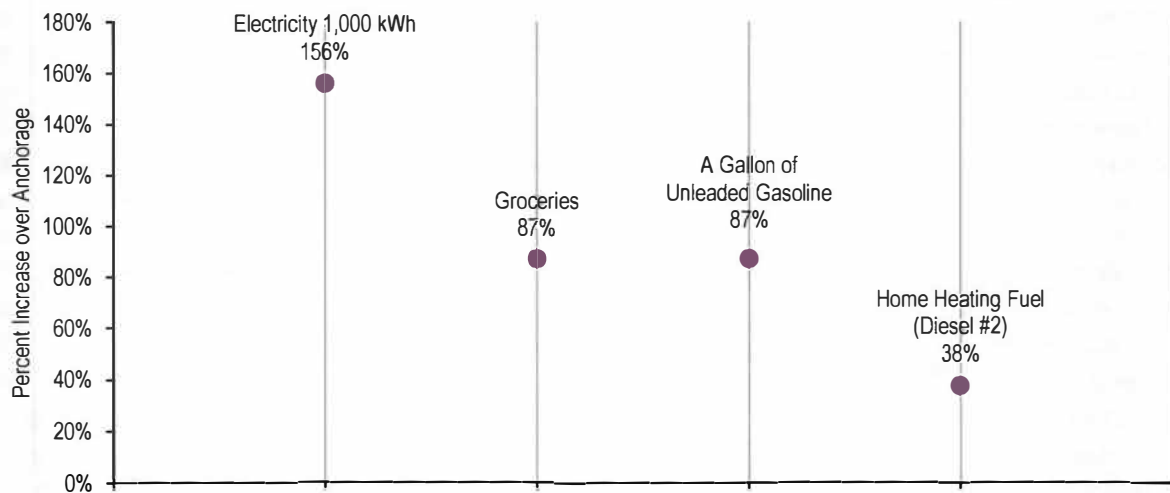
ES Figure 1. Actual and Forecast Population and School Enrollments in the Bristol Bay Region, 2008–2030



## Cost of Living

The study team uses several metrics to ascertain the cost of living in the Bristol Bay region. The cost of groceries, fuel (unleaded gasoline, home heating fuel, and diesel fuel), electricity, and fuel for utilities are all much higher in the Bristol Bay region than in more populated parts of the state. Relative to Anchorage, the Bristol Bay region sees an average 156 percent increase in the cost of electricity per 1,000 kWh, an 87 percent increase in the cost of groceries for a week for a family of four, an 87 percent increase in the price of unleaded gasoline per gallon, and a 38 percent increase in the price of home heating fuel per gallon over the analysis period (1996–2021). This disparity can be seen in ES Figure 2, which is an average of sometimes sparse data over the analysis period and adjusted for inflation to 2021 dollars. Since the 2009 and 2012 importance of salmon to Bristol Bay reports, Bristol Bay and other rural areas' cost of living has continued to increase relative to Anchorage.

ES Figure 2. The Cost of Living in the Bristol Bay Region Relative to Anchorage

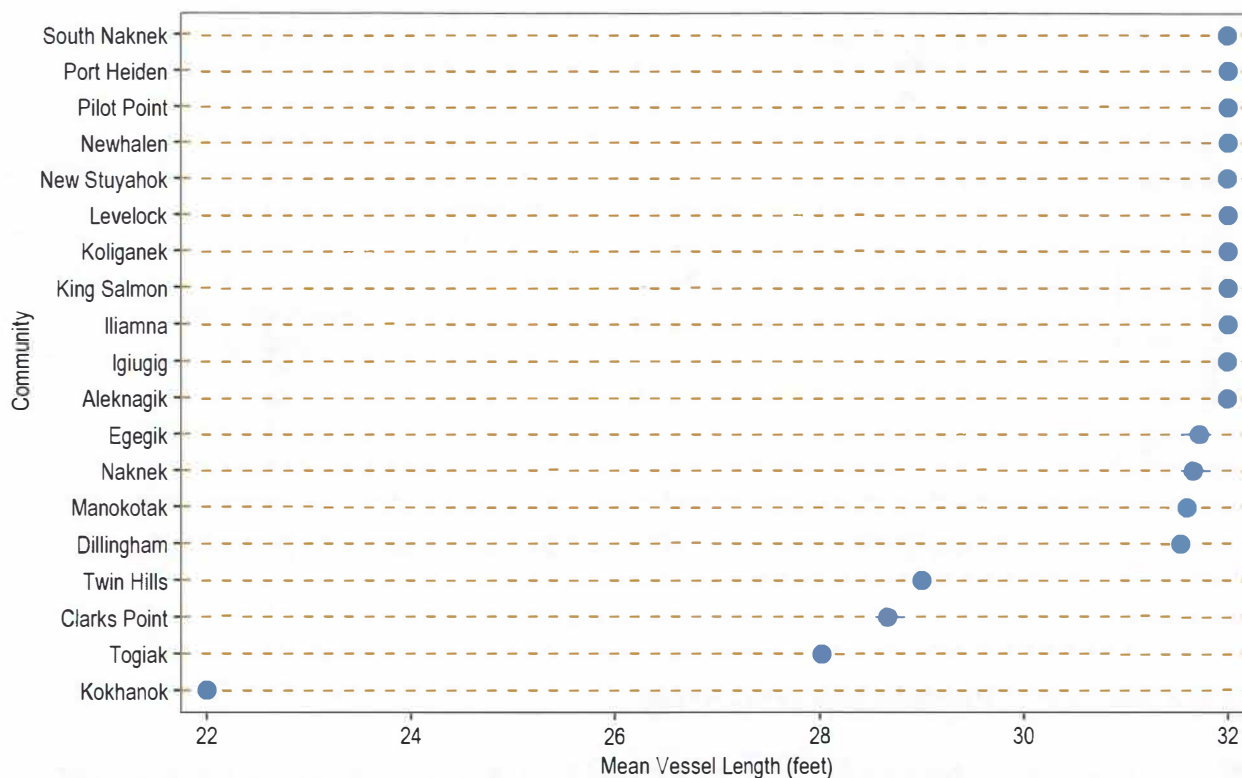


Source: Alaska Energy Authority (2022); Alaska Department of Labor and Workforce Development (2022); Northern Economics, Inc. analysis

## Comparisons of Vessel Characteristics

Our 2012 report found that vessels operated by Bristol Bay residents were older, smaller, and shorter than vessels operated by individuals who reside outside of Bristol Bay communities. In addition, we found that Bristol Bay vessels had lower horsepower ratings, less fuel capacity, and a lower prevalence of refrigeration capabilities. We confirm that these trends hold into 2021, and in particular, find that heterogeneity in vessel sizes is more prominent in some communities than others. As of 2021, slightly more than half of the vessels active in Bristol Bay communities were 32-foot vessels (ES Figure 1). However, in Togiak, the majority of vessels are less than 30 feet, with 23 of 42 vessels falling in the 20–29 feet in length category—the average vessel length there is 28 feet.

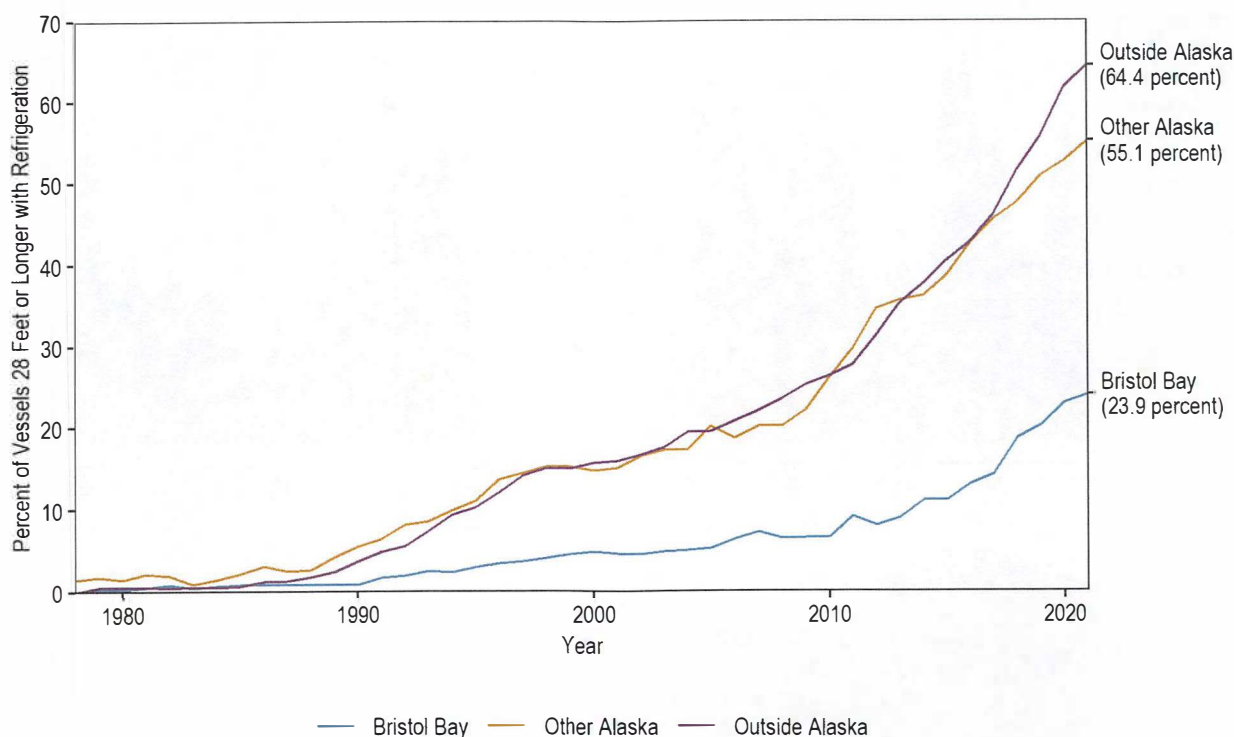
ES Figure 3. Mean Length of Vessels Owned by Bristol Bay Residents, by Community, 2021



Source: CFEC (2021)

Additionally, we find dramatic increases in the prevalence of refrigeration across all vessels. In our last report, ending in 2008, we found that only eight percent of vessels in Bristol Bay had some form of refrigeration compared to 22 percent of nonresident vessels—in 2021, 24 percent of Bristol Bay vessels over 28 feet in length had some form of refrigeration capacity compared to 64 percent of nonresident vessels (ES Figure 2). This illustrates that while refrigeration has increased sharply across all groups a persistent gap remains.

ES Figure 4. Prevalence of Refrigeration Over Time in Vessels Over 28 Feet by Owner's Residence, 1978–2021

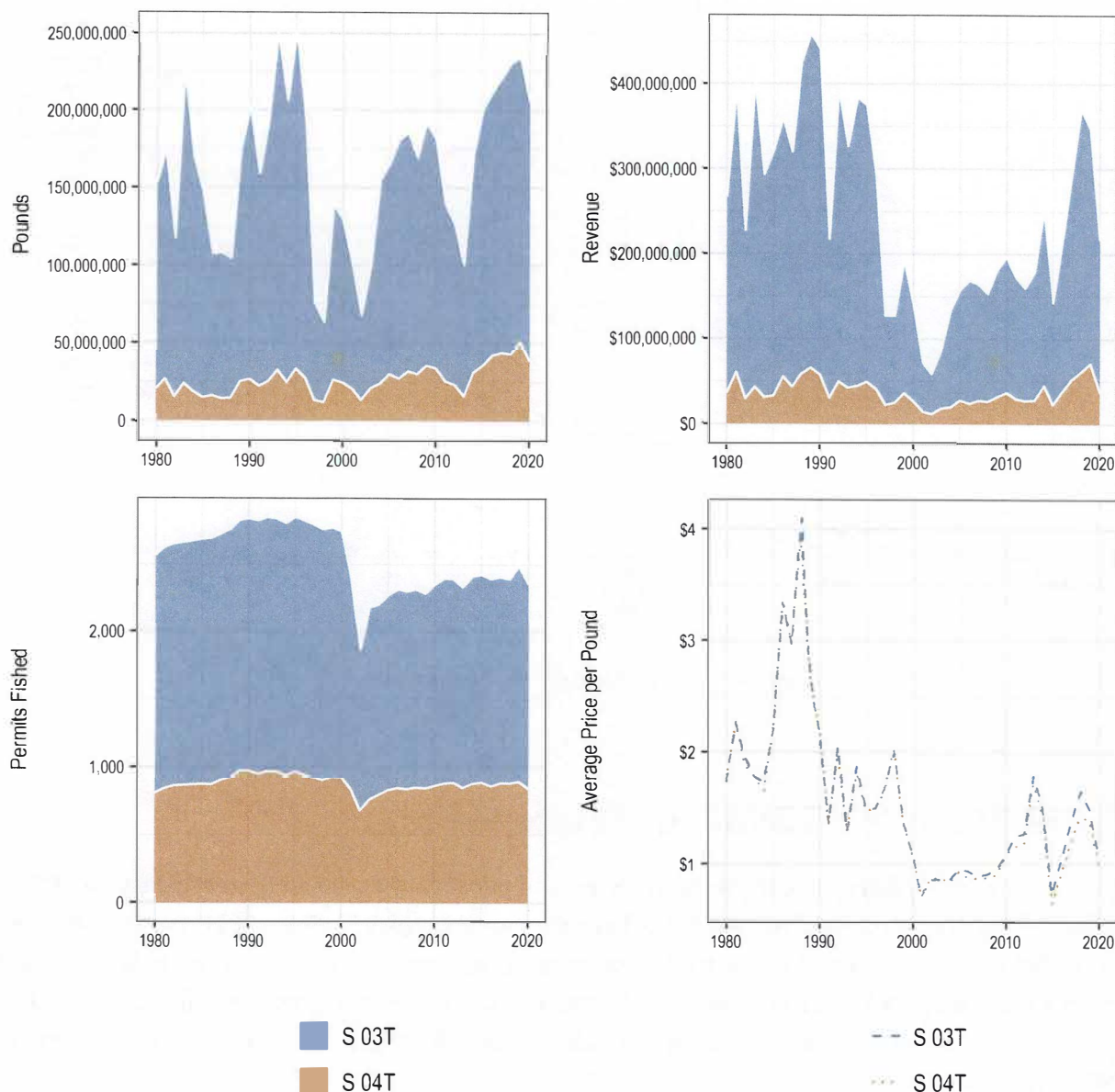


## Economic Trends Across Bristol Bay Salmon Fisheries

Compared to setnet fishery, total landings, revenue, and participation are consistently highest in the drift net fishery, though prices have generally been similar (ES Figure 5). Since 2010, participation in the drift fishery has fluctuated around 1,500 permits fished, from a low of 1,488 permits fished in 2013 to a high of 1,605 in 2019 (Table 3). In the setnet fishery, annual participation has generally been around 880 permits fished, but dropped by approximately 50 permits between 2019 and 2020 to 840 permits fished.

Between 2017 and 2019, total driftnet revenues far exceeded the 10-year average of \$190.8 million—in 2018, revenues reached \$309.7 million. While participation levels in that year were similar to average, at 1,518 permits fished, 2019 saw a spike in participation to 1,605 permits fished—the highest level in a decade. However, in 2019, both average prices and total landings fell, leading to lower total revenues at \$275.6 million. In 2019, we see record revenues were reached at \$71.5 million, the previous highest grossing year in our time series was 1989 at \$66.3 million. However, similar to the driftnet fishery, the 2020 setnet fishery experienced a drop in prices and landings. This resulted in a 46.6 percent decline in year over year revenues to \$38.2 million—similar to the 10-year average of \$38.2 million (ES Figure 5).

ES Figure 5. Economic Trends in the Drift (S 03T) and Setnet (S 04T) Fisheries Across All Permit Holders



Source: Commercial Fisheries Entry Commission (CFEC, 2021), Northern Economics, Inc. analysis

### Driftnet Fishery

Since 2002 there has been a slightly upward trend in the total number of driftnet permits fished, largely accounted for by non-Alaska permit holders. This is in contrast to the number of permits fished by Bristol Bay region residents, which have slowly declined in the same time period. Overall, while Bristol Bay region permit holders have usually accounted for at least 25 percent of all permits fished, this dropped to 16 percent in 2020, due to a gradual increase in the share of non-Alaska and other Alaska resident permit activity. Consistent with the historical trend, in 2020, non-Bristol Bay resident permit holders (both other Alaska residents and non-residents) earned approximately \$125,000 per permit fished while Bristol Bay region permit holders earned slightly less than \$75,000.

Within the Bristol Bay Region, Dillingham Census Area stands out as the area with the consistently highest number of permits fished across the three sub-regions. In recent years, Bristol Bay Borough residents have surpassed Lake and Peninsula Borough as having the second highest number of permits fished. In terms of average earnings per permit fished. We also find that on average, Bristol Bay Borough residents tend to earn more per permit fished than other sub-regions. In 2020, Bristol Bay Borough Residents earned \$97,229 per permit fished, while Lake and Peninsula Borough residents earned \$86,208, and Dillingham Census Area residents earned \$57,450, on average. Trends for average per capita revenue over the last 10 years are similar. In Bristol Bay Borough, the recent average per capita revenue was \$5,750, in Dillingham Census Area it was \$2,867, and in Lake and Peninsula Borough it was \$1,635. The communities with the highest level of driftnet participation and earnings in each borough are first, Naknek, in Bristol Bay Borough, Dillingham, in Dillingham Census Area, and in recent years, Port Heiden in Lake and Peninsula Borough (Figure 37 and Figure 40). While BBEDC communities account for most, if not all, of revenue and participation from Bristol Bay and Dillingham Census Area communities, approximately 40 percent of total driftnet earnings, on average, come from non-BBEDC communities in Lake and Peninsula Borough (Figure 48).

### Setnet Fishery

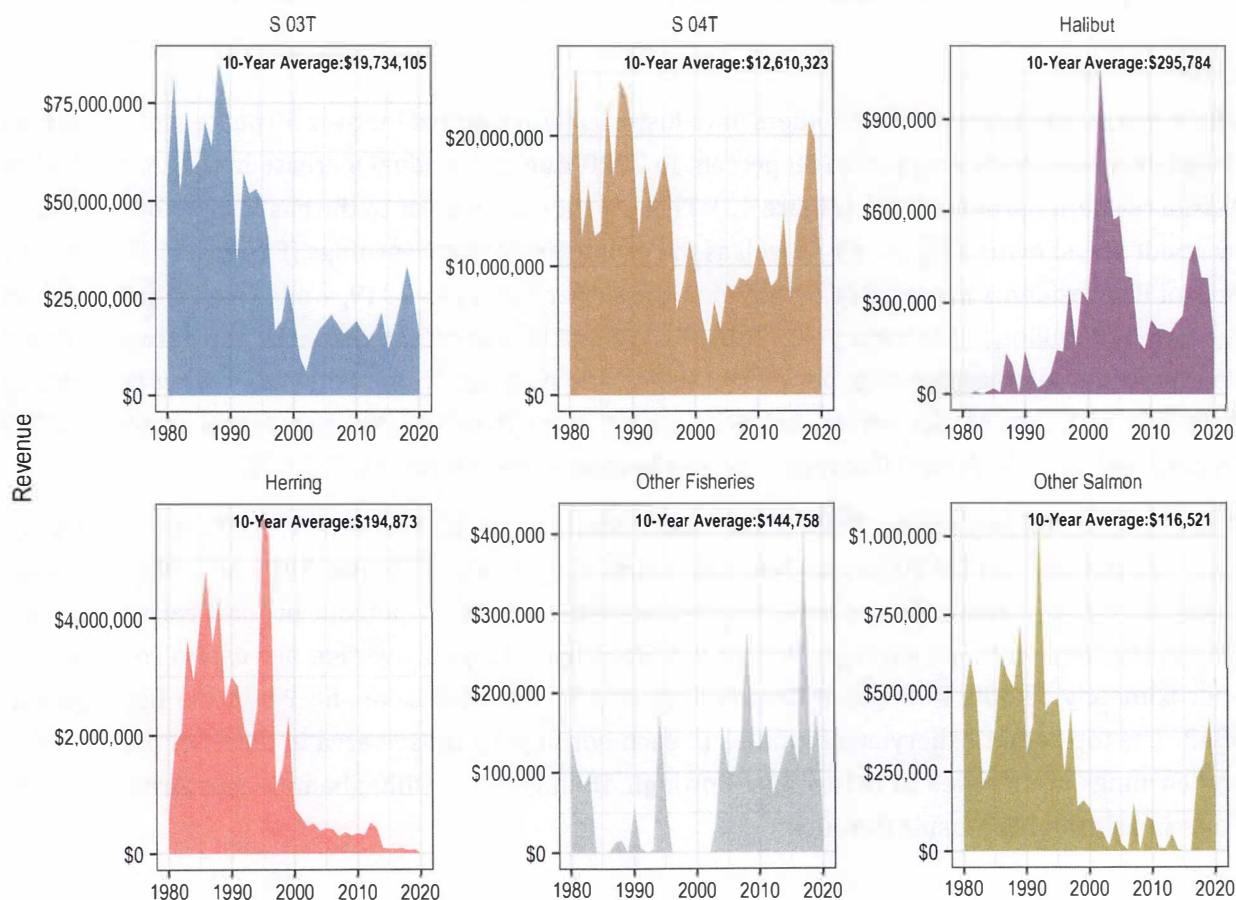
While Bristol Bay region permit holders have historically accounted for over 50 percent of all permits fished, this has slowly dropped to 38 percent in 2020, due to a gradual increase in the share of other Alaska resident permit activity (Figure 42). These trends are similar to the changes in total earnings by residence, shown in Figure 43, as well as the proportion of total earnings (Figure 44). Earnings by Bristol Bay residents topped \$21.6 million in the setnet fishery in 2019, while total setnet earnings reached \$70 million in the same year (Table 7). We find that in recent years, the gap between Bristol Bay residents' average earnings per permit fished and earnings from residents in other regions has widened, with non-Alaska permit holders earning more than \$87,000 per permit fished in 2019 (record highs) while Bristol Bay region permit holders earned less than \$70,000.

Within the Bristol Bay region, Dillingham Census Area has the highest level of S 03T permit activity, even as total permits fished has declined over time (Figure 45). Between 2015 and 2020, earnings from Dillingham Census Area permit holders accounted for 64.4 percent of total earnings across Bristol Bay residents, on average. Bristol Bay Borough's 10-year average per capita revenue was approximately \$3,800, Dillingham Census Area was \$1,795, and Lake and Peninsula Borough was \$843. The top setnet fishery communities in each borough or census area in terms of participation and earnings are Naknek in Bristol Bay Borough, Dillingham in Dillingham Census Area, and Pilot Point in Lake and Peninsula Borough.

## Other Fishery Revenue and Participation

We examined total revenue and permits fished in each of six listed fishery groups: S 03T (drift salmon, S 04T (setnet) salmon, Other non-Area T salmon, Herring, Halibut, and other fisheries<sup>1</sup> for permit holders in BBEDC communities. Compared to the large total revenue contributions of the two Bristol Bay salmon fisheries, all other fisheries revenue represents a minor fraction of total revenues in BBEDC communities, especially in recent years, indicating that local permit holders have a strong reliance on Bristol Bay salmon fisheries for their fishery incomes. Between 2010 and 2022, earnings in the halibut fishery were the highest on average among the other fisheries at \$295,784, followed by herring at \$194,873. Earnings from both of these fisheries have been lower than historical levels, in the mid-1990s herring revenue exceeded \$5 million, and in the early 2000s halibut revenue peaked at around \$1 million.

ES Figure 6. Total Revenue by Fishery for BBEDC Community Permit Holders



<sup>1</sup> Residents of the Bristol Bay Region have participated in many other fisheries throughout Alaska, including the Dungeness, king, and tanner crab fisheries, as well as groundfish, sablefish, shrimp, and other shellfish fisheries.



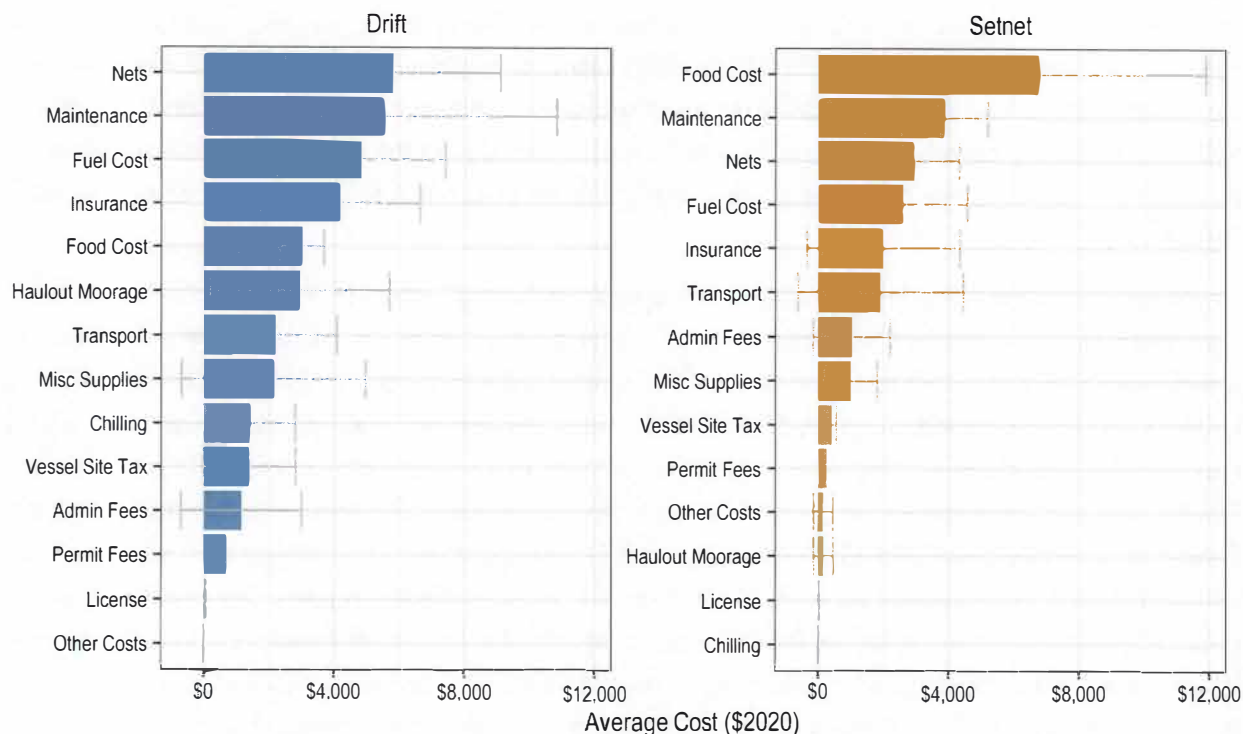
## Estimated Operating Costs in the Set and Driftnet Fisheries

In the winter of 2021, we conducted 15 interviews with drift and set net permit owners to ask them about their operating costs in their 2021 fishing season, or their most recent fishing year that they have cost information. We used this information to generate average estimates of operating costs by fishery, and for Bristol Bay resident driftnetters, noting that due to the limited sample size it was not possible to estimate costs for other populations, such as for other Alaska residents or non-Alaskan residents.

Estimated operating costs for drift and setnet operations are shown in ES Figure 6. For driftnetters, nets were estimated to be the single largest operating cost, at \$5,791 on average across the 11 interviews (Table 14). This included the costs of repairs, new web, and hanging. However, as shown by the standard deviation (in grey, ES Figure 6), reported net and maintenance costs were highly variable, and individuals often either reported net costs or maintenance costs (\$5,550, on average, SD=\$5,280) as the highest single cost. Other top expense categories for drift netters included fuel and insurance, averaging \$4,800 and \$4,200, respectively. Chilling costs were estimated at \$1,400 a year, which included maintenance on an RSW system, ice, or any needed repairs. Several respondents noted that costs had been offset by BBEDC grant programs for RSW maintenance, at \$1,000 per year. We estimate that on average \$1,150 was spent on administrative services. This includes all expenses for an accountant, any legal fees, or association dues, though two interviewees reported that they did not pay for any administrative services, while two local residents noted that they were able to take advantage of tax preparation subsidies provided by BBEDC.

For setnetters, food costs were estimated as the highest single cost category at \$5,000 a season, followed by maintenance costs at \$3,875, and fuel costs at \$3,850 (ES Figure 6). The variability around most operating costs is high for setnetters, in part because of the limited sample size in the interviews (four interviews total). Despite the small sample size, our results are consistent with expectations about costs in the fishery. Because vessels used in the setnet fishery are likely to be skiffs, fuel and other vessel-related maintenance costs are likely to be lower than for drift vessels. Food costs are also likely to be higher for setnetters since operations are likely to be based at the setnet site, and all crew may reside there for the season. Among the top costs, food costs were the most variable, ranging from \$1,100 to \$12,000. The individual interviews help explain some of this variability since at least one operator reported that their operation is a large family venture, where several family members come out for the summer to fish.

ES Figure 7. Average Estimated Operating Costs by Category and Fishery



Note: License and Permit Fees are technically fixed costs but are included in our overall calculations due to their availability. Additionally, error bars represent +/- one standard deviation of the calculated mean for each cost and therefore may include \$0 or negative values.

Source: All costs are derived from Northern Economics Analysis, average revenue by fishery is from CFEC data

## Economic Impacts of Bristol Bay Salmon Harvests

The drift and setnet salmon fisheries in Bristol Bay are major contributors to the economy of the Bristol Bay Region. In this section of the report, we estimate that the 2020 drift and setnet harvests of Bristol Bay salmon contributed 52% of the 2020 GDP in the Bristol Bay Region as estimated by the U.S. Bureau of Economic Analysis (BEA 2021). Northern Economics estimates that the total economic contribution of the salmon harvest in 2020 was \$234,635,000 and comprised the following:

- Ex-vessel revenue in the 2020 drift net fishery equal to \$179,970,000 as per CFEC (2021).
- Ex-vessel revenue in the 2020 set net fishery equal to \$38,044,000 as per CFEC (2021).
- Fishery Business Taxes and Raw Fish Taxes from the 2020 Bristol Salmon Fishery of \$9,579,000 as estimated by Northern Economics.
- Multiplier Effects of \$7,039,000 as estimated by Northern Economics.