A Linked Economy:

Southwest Alaska's Economic Linkages to the State and Beyond

Prepared for

The Southwest Alaska Municipal Conference

June 2016

Northern Economics

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PROFESSIONAL CONSULTING SERVICES IN APPLIED ECONOMIC ANALYSIS

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Abbreviations

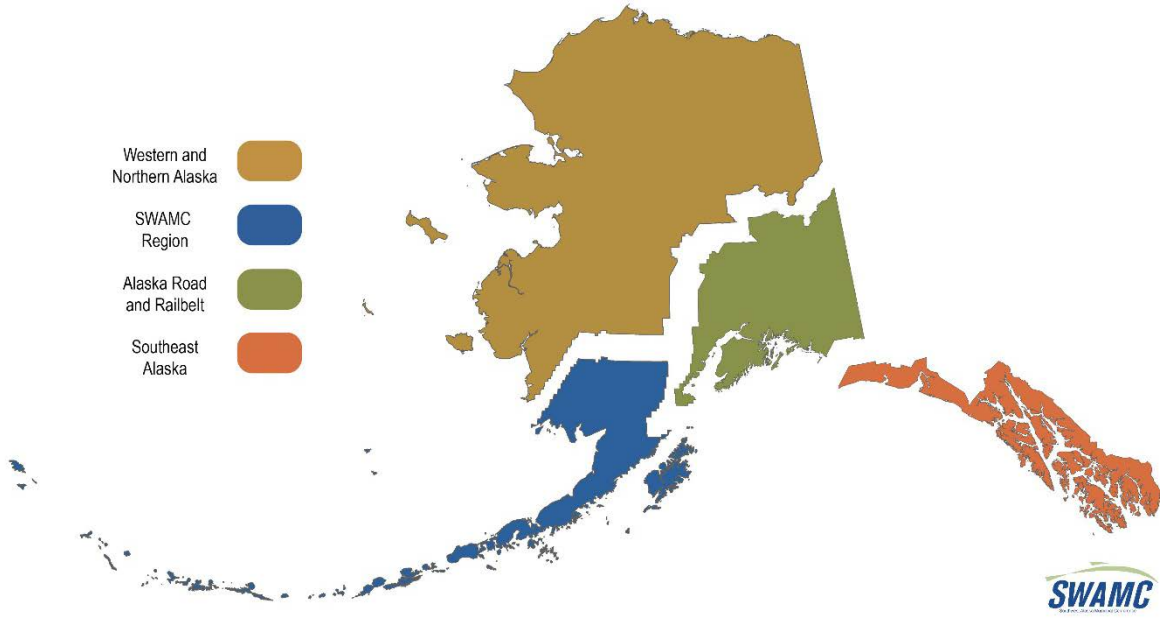
ADOLWD	Alaska Department of Labor and Workforce Development
ADOTPF	Alaska Department of Transportation and Public Facilities
AIRA	Aleutian Islands Risk Assessment
AMHS	Alaska Marine Highway System
ARR	Alaska Road and Railbelt
AVSP	Alaska Visitors Statistics Program
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BTS	Bureau of Transportation Statistics
CFEC	Commercial Fisheries Exchange Commission
GRP	Gross Regional Product
NOAA	National Oceanic and Atmospheric Administration
PFD	Permanent Fund Dividend
QCEW	Quarterly Census of Employment and Workers
SE	Southeast Alaska
SW	Southwest Alaska
SWAMC	Southwest Alaska Municipal Conference; also refers to the Southwest Alaska region
USACE	United States Army Corps of Engineers
WN	Western and Northern Alaska

Executive Summary

Southwest Alaska's low population—the region is the least populated of the third least populated state in the U.S.—belies its geographic vastness and the significance of its largely fisheries-based economy. In terms of total area, Southwest Alaska (SW)[1] is larger than 39 U.S. states, and seafood harvests from its waters are among the highest in weight and value in the country. To the region, state, and country, as well as to international trade partners, SW's fisheries represent an economic engine thanks to the jobs, income, and taxes that they generate, as well as the products they provide to consumers domestically and abroad.

Much of this study is devoted to the comparison of economic measures across regions of Alaska. It is therefore important to identify the four regions of Alaska, as defined by this study, before proceeding further. SW comprises Aleutians East Borough, Aleutians West Census Area, Bristol Bay Borough, Dillingham Census Area, Kodiak Island Borough, and Lake and Peninsula Borough. The Alaska Road and Railbelt (ARR) includes the Railbelt areas, as well as the Southeast Fairbanks Census Area and Valdez-Cordova Census Area. Western and Northern Alaska (WN) comprises all boroughs and census areas north and west of ARR and SW, and Southeast Alaska (SE) includes all areas southeast of the Valdez-Cordova Census Area. Figure ES-1 is a map of the four regions, and Section 1.2 presents a complete list of the constituent areas of each region.

Figure ES-1. Map of Alaska Regions



Source: Northern Economics, Inc.

[1] This report uses "SW" and "SWAMC" interchangeably to refer to the Southwest region.

To put the importance of SW fisheries in perspective, one need look no further than a list of the top fisheries ports in the U.S., as measured by harvest weight and value of shore-based seafood landings (see Table ES-1). SW boasted seven of the top ten ports in the country by value of commercial seafood landings in 2014, as well as six of the top ten ports by weight of landings.

Table ES-1. Top SW Ports by Value and Weight of Seafood Landings, 2014

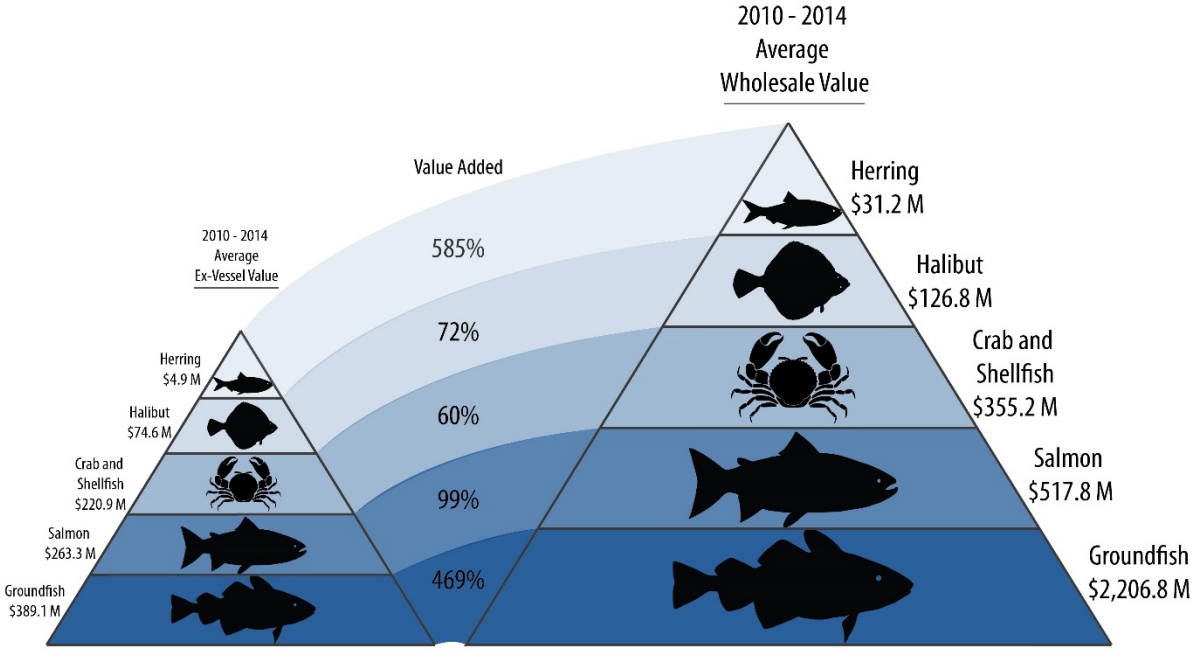
Port	Landed Value ($ Million)	U.S. Rank	Weight (Million pounds)	U.S. Rank
Dutch Harbor	191	2	762	1
Kodiak	143	3	477	2
Naknek	135	5	133	10
Aleutian Islands (other)	107	7	471	3
Alaska Peninsula (other)	87	9	170	8
Bristol Bay	82	10	59	22

Source: NMFS 2015.

Seafood landings are important sources of income to the residents of SW's four boroughs and two census areas, residents of other regions of Alaska, and non-Alaskans. In fact, this study estimates that 63 percent of ex-vessel revenues generated by SW shore-based fishery landings from 2010–2014 went to non-Alaska residents, compared to 24 percent to ARR residents and 11 percent to residents of SE.

Meanwhile, the value of commercial landings from SW waters greatly understates the total economic value of the region's fisheries. This study estimates that the wholesale value of commercial seafood harvests is more than three times the ex-vessel value of shore-based landings. The percentage increase from the ex-vessel value to wholesale value varies considerably by SW fishery, as exhibited in Figure ES-2. For each of five SW fisheries, average ex-vessel and wholesale values are shown in the pyramids' tiers, along with the percent value added from the ex-vessel to wholesale sale. Importantly, the wholesale value of the SW groundfish fishery includes both shore-based deliveries and estimated at-sea harvest values.

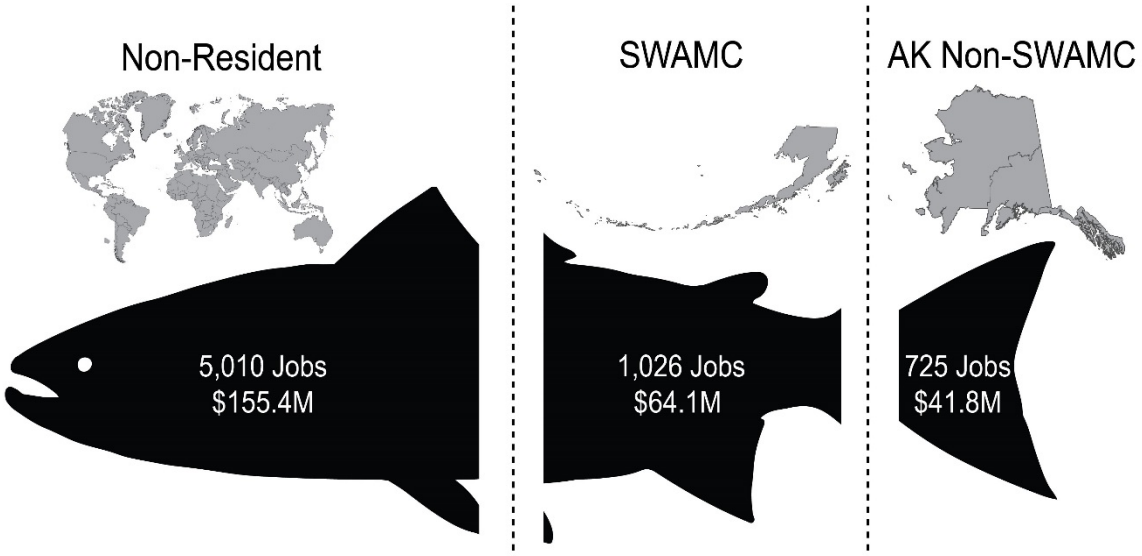
Figure ES-2. Average Ex-Vessel and Wholesale Values of SW Fisheries, 2010–2014



Source: Estimated by Northern Economics using data from CFEC (Goh 2016) and Alaska Fisheries Information Network (AKFIN) (Fey 2016).

Labor income from shore-based seafood processing jobs constitutes much of the value that is added to landed products between ex-vessel and wholesale sale. Similarly to the varied distribution of ex-vessel revenues to residents of multiple regions, shore-based seafood processing jobs held in the SW region are important sources of employment to SW residents, residents of other regions of Alaska, and non-Alaskans alike. Figure ES-3 provides the breakdown of average annual shore-based seafood processing jobs and wages across these three groups over the years 2010–2014. Overall, shore-based seafood processing operations in SW generated an average of 6,761 jobs per year and $261.3 million in labor income. Of these totals, non-Alaskans held 74 percent of the jobs and took home just under 60 percent of wages. In comparison, SW residents held only 15 percent of the jobs but enjoyed a proportionally much larger share—25 percent—of wages. Meanwhile, residents of other regions of Alaska benefitted from 745 jobs and just under $42 million in labor income from these jobs per year.

Figure ES-3. Average Distribution of Shore-Based Seafood Processing Jobs and Wages by Region of Residence, 2010–2014



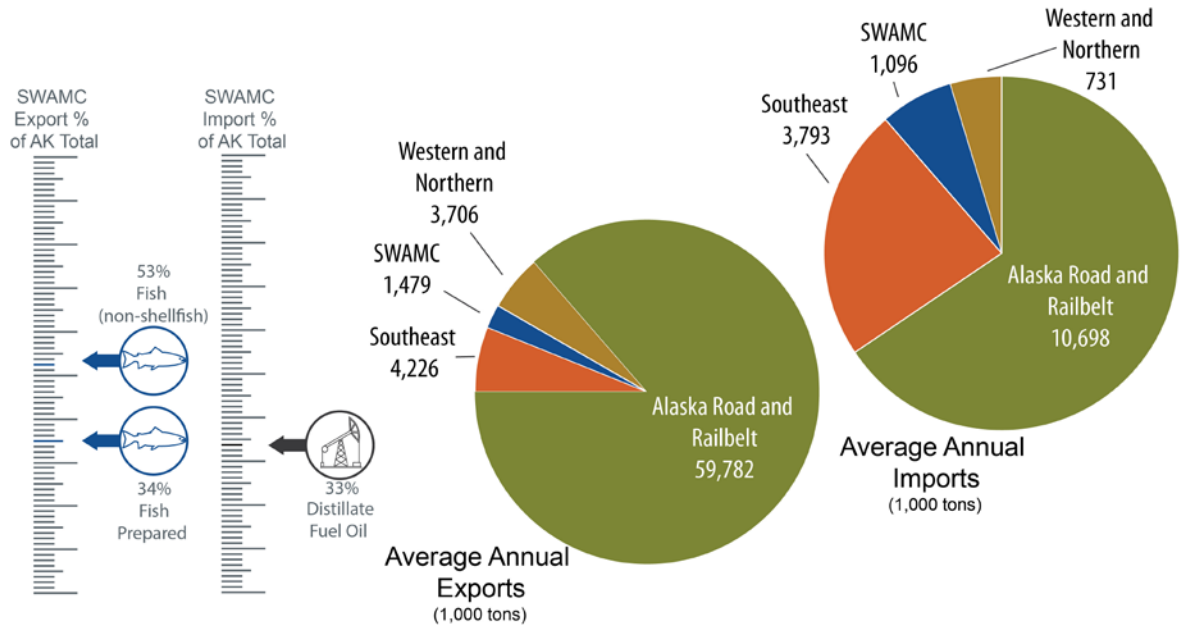
Source: Figure developed by Northern Economics using data from ADOLWD (Robinson 2016).

Notably, seafood processing is not only an integral component of the SW region's economy, but of the state economy as well. Our analysis estimates that the seafood product preparation and packaging sector ranked third statewide in 2014 in terms of total economic output, at $3.46 billion. Of this total, seafood processing operations in SW constituted an impressive 68 percent, or $2.35 billion (IMPLAN 2016). When one considers that the top two sectors—and five of the top ten—statewide in 2014 were associated with oil and gas production, transportation, and refining, the economic output generated by seafood processing operations in SW is particularly noteworthy.

Fisheries also emerge prominently in the context of the region's domestic and international trade. Interregional trade flows measure the value of commodities and services produced in one region and exported to another. IMPLAN analysis of trade flows between SW and other regions of the state, as well as the rest of the U.S., indicates that more than 80 percent of the $2.6 billion in trade from SW to the rest of the U.S. in 2014 fell into the "Food Products" category. It is not a stretch to conclude that seafood products constituted the vast majority of these trade flows. Meanwhile, SW experienced a net trade flow surplus overall but a clear deficit in its trade with ARR, with imports exceeding exports by a factor greater than three. Petroleum products were SW's top import from ARR (IMPLAN 2016).

Without a road system connecting SW to other parts of Alaska, waterborne commerce provides a vital economic link between SW and other regions. Waterborne commerce is also the primary means of trade between SW and its international trading partners. The pie charts in Figure ES-4 depict average annual waterborne exports from and imports to the four regions of the state in thousands of tons. Domestic exports and imports are exports to and imports from other regions of the state or other U.S. states. SW, like the other three regions of Alaska, is a net domestic exporter via waterborne commerce, at least in terms of weight. Moreover, despite occupying a relatively small portion of the domestic export pie, SW's domestic exports of fish and processed fish constitute 53 percent and 34 percent of domestic waterborne exports of those commodities by Alaska as a whole. Meanwhile, SW is responsible for one-third of Alaska's domestic waterborne imports of distillate fuel oil. These percentages are depicted in the vertical axes at the left side of Figure ES-4; the axes measure the proportional share of exports and imports of these commodities by SW, with 0 percent at the bottom of the axes and 100 percent at the top.

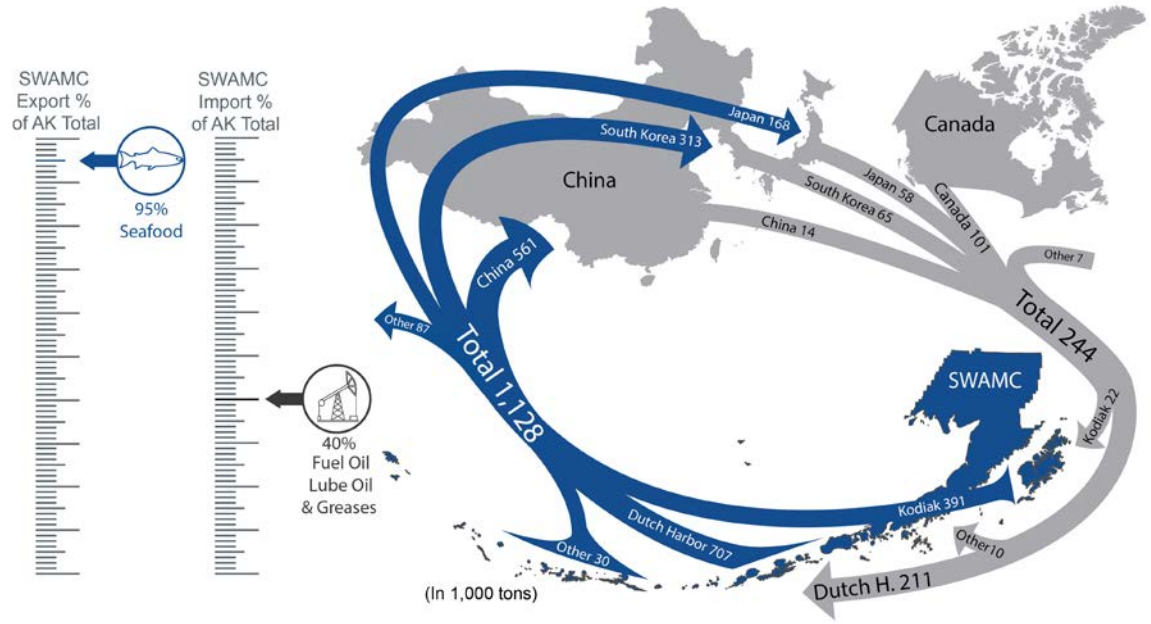
Figure ES-4. Average Annual Domestic Waterborne Exports and Imports by Region, 2012–2013



Source: Developed by Northern Economics based on data from USACE (2015).

International waterborne trade is also a vital component of SW's economy. In terms of weight, SW's international waterborne exports were nearly four times greater than its imports from 2012–2014 (see Figure ES-5), with significant volumes of cargo departing Dutch Harbor and Kodiak and heading mostly to the East Asian destinations of China, South Korea, and Japan. In Figure ES-5, ports of origin and destination countries for exports, as well as associated volumes, are depicted with the blue lines, while the gray lines indicate countries of origin and SW destination ports for imports. Notably, SW accounted for 72 percent of international waterborne exports of fish from Alaska over the three-year period and just over one-third of the state's total international waterborne imports of distillate fuel oil.

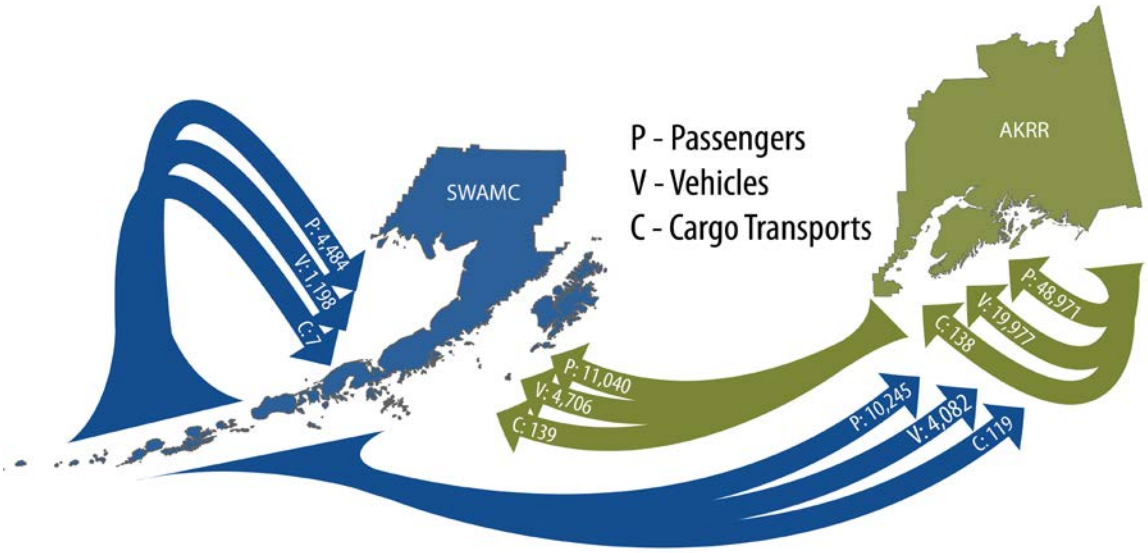
Figure ES-5. Average Annual International Waterborne Imports and Exports (1,000 tons), SW, 2012–2014



Source: Developed by Northern Economics based on data from USACE (2015).

The lack of a road system connecting SW to the rest of the state also means that the region's residents depend heavily on the Alaska Marine Highway System (AMHS) for travel, as well as transport of vehicles and cargo, both between SW communities and between SW and ARR. As shown in Figure ES-6, more than 10,000 people and more than 4,000 vehicles were transported from SW to ARR annually over the four years 2010–2012 and 2014,[2] with slightly higher volumes of passengers and vehicles being transported from ARR to SW. Meanwhile, an average of nearly 4,500 passenger trips and approximately 1,200 vehicular trips were made on the AMHS between SW communities over the four years under analysis.

Figure ES-6. Average Annual Intra- and Interregional Utilization of AMHS, 2010–2012 & 2014



Source: Developed by Northern Economics based on data from ADOTPF (2015a).
Note: AMHS counts passengers, vehicles, and cargo transports each as individual units. AMHS defines cargo shipments, in part, as "vans," which are defined "as vehicles, normally commercial, of any length and from 12' to 13' in height with enclosed cargo space.

[2] This analysis excludes 2013 because the M/V Tustumena was out of commission for much of the year and service to SW was greatly reduced.

Air transport also represents a critical means of connection between SW and the rest of Alaska, particularly ARR. Each year, air travel is responsible for the conveyance of hundreds of thousands of passengers and many millions of pounds of freight and mail to and from SW communities. Importantly, study results indicate that Anchorage is a hub for the transport of passengers, freight, and mail between SW and ARR. As illustrated in Table ES-2, Anchorage was the destination for the top three origin-destination pairs for passenger and freight transport from SW over the years 2010–2014, as well as the origin for the top three origin-destination pairs for passenger and freight transport to SW. Anchorage was also the community of origin for the top three origin-destination pairs for mail transport to SW.

Table ES-2. Total Passenger and Freight Transport to and from SW by Top Origin-Destination Pairs, 2010–2014

Passengers from SW			Passengers to SW		
Origin	**Destination**	**Passengers**	**Origin**	**Destination**	**Passengers**
Kodiak	Anchorage	336,569	Anchorage	Kodiak	334,549
Unalaska	Anchorage	135,115	Anchorage	Unalaska	130,061
King Salmon	Anchorage	126,710	Anchorage	King Salmon	127,599
Freight from SW			**Freight to SW**		
Origin	**Destination**	**Freight (Million lb)**	**Destination**	**Origin**	**Freight (Million lb)**
Kodiak	Anchorage	31.6	Anchorage	King Salmon	21.5
King Salmon	Anchorage	8.1	Anchorage	Dillingham	17.1
Unalaska	Anchorage	7.2	Anchorage	Kodiak	14.5

Source: Developed by Northern Economics based on data from BTS (2015).

Many visitors to Alaska take advantage of SW's ample fishing opportunities, natural beauty, and other attractions. The most recent Alaska Visitors Statistics Program study, conducted in 2011, revealed some pronounced trends in visitation to SW. Non-Alaskans who spend time in SW during their time in Alaska tend to report longer visits to the state overall and spend more money than those who do not visit SW. In addition, non-Alaskans who visit SW during their Alaska trip indicate that they are far more likely to return to Alaska and recommend the state as a vacation destination than those who do not (DCCED 2012). More recent visitor survey statistics revealed that four percent of Alaskan visitor industry jobs held from October 2013 through September 2014 were located in SW, while five percent of total visitor spending took place in SW over the same time period (DCCED 2015).

1 Introduction

1.1 Objective

The Southwest Alaska Municipal Conference (SWAMC) is a regional membership organization whose mission, in part, includes the advancement of the collective interests of Southwest Alaska and the promotion of economic opportunities to improve the quality of life of residents of the region (SWAMC 2016). The SWAMC region comprises four boroughs and two census areas that span a broad geographic swath of the state and is home to several of the largest commercial fisheries in the United States. SWAMC contracted with Northern Economics, Inc. to conduct analysis on the economy of Southwest Alaska (SW), with a focus on the region's inter-regional economic linkages.

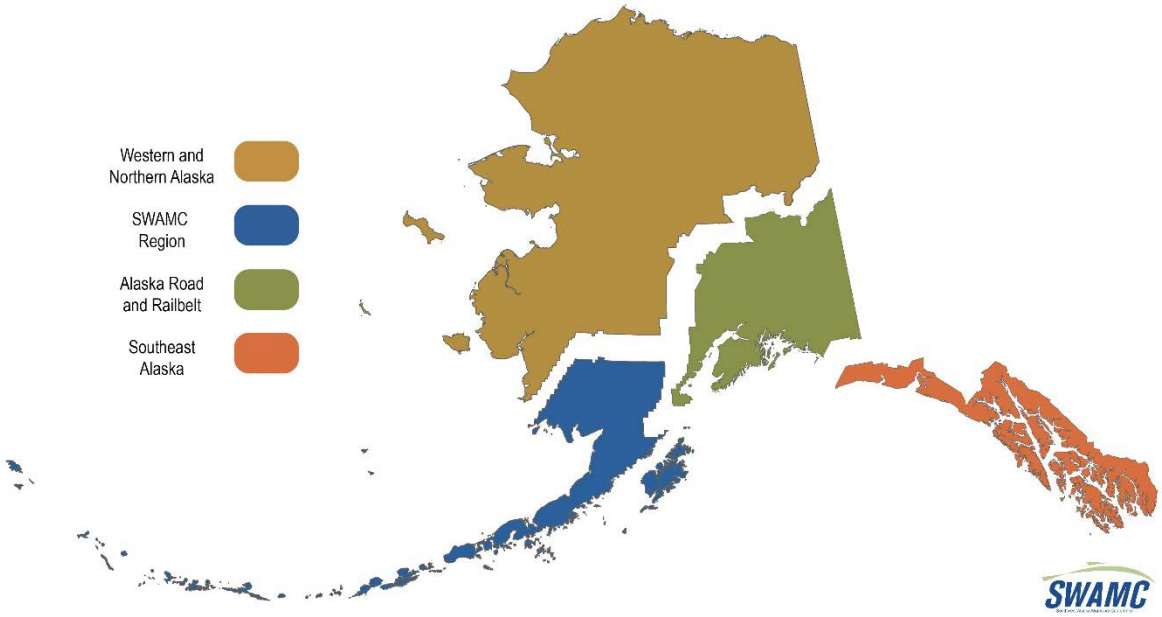
1.2 Geographic Overview

For purposes of this analysis, the study team divided Alaska into four regions. These regions are defined as follows and depicted in Figure 1:

1) SWAMC Region (SWAMC; SW): Dillingham C.A., Bristol Bay Borough, Lake and Peninsula Borough, Aleutians East Borough, Aleutians West Census Area, and Kodiak Island Borough.
2) Alaska Road and Railbelt (ARR): Municipality of Anchorage, Matanuska-Susitna Borough, Kenai Peninsula Borough, Valdez-Cordova Census Area, Denali Borough, Fairbanks North Star Borough, and Southeast Fairbanks Census Area
3) Western & Northern Alaska (WN): Bethel Census Area, Kusilvak Census Area (formerly Wade Hampton Census Area), Yukon-Koyukuk Census Area, Nome Census Area, North Slope Borough, and Northwest Arctic Borough.
4) Southeast Alaska (SE): Haines Borough, Hoonah-Angoon Census Area, City and Borough of Juneau, Ketchikan Gateway Borough, Petersburg Borough, Prince of Wales-Hyder Census Area, City and Borough of Sitka, Municipality of Skagway Borough, City and Borough of Wrangell, and the City and Borough of Yakutat.

This study devotes considerable attention to comparative economic measures across these four regions and economic linkages between them. Where applicable, this analysis also identifies economic flows to and from the remainder of the United States (termed "rest of the U.S.," as well as specific foreign countries.

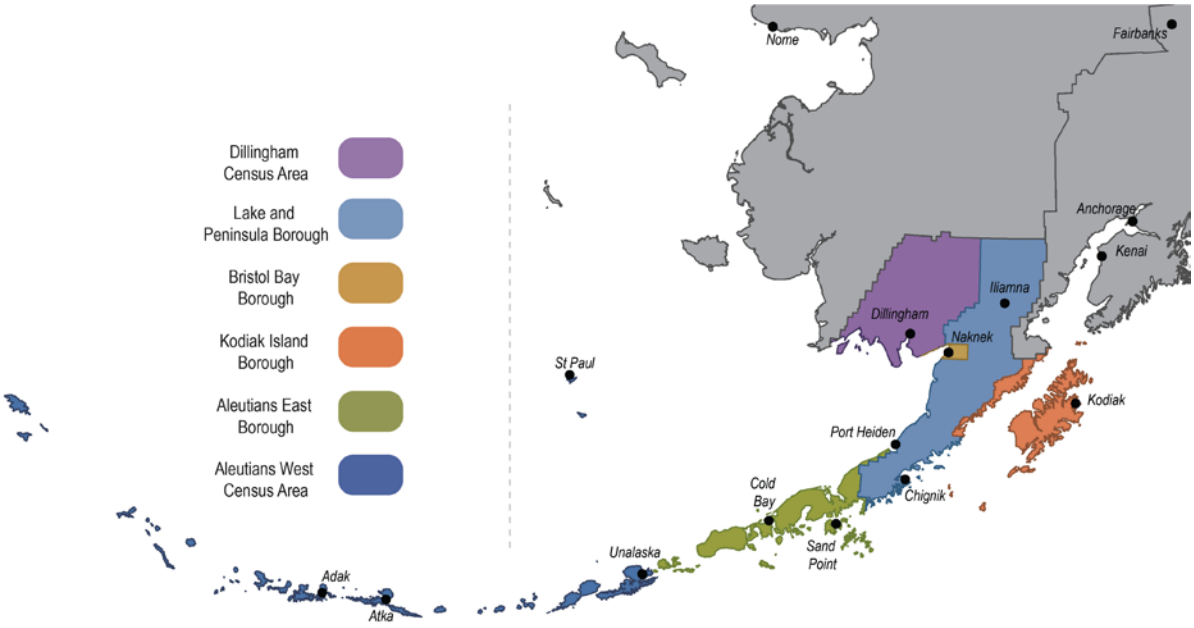
Figure 1. Map of Alaska Regions



Source: Northern Economics, Inc.

As noted above, four boroughs and two census areas constitute SW. The geographic boundaries of these six areas are shown below in Figure 2.

Figure 2. SW Boroughs and Census Areas



Source: Northern Economics, Inc.

1.3 Organization of the Report

This report contains ten sections:

Section 1. Introduction. This section defines project objectives, geographic scope and definitions, and the report layout.

Section 2. Demographic Overview. This section compares a broad range of socioeconomic measures across the four regions, including population totals and racial/ethnic composition, income by sector by place of residence and place of work, and employment by sector by place of residence and place of work. Section 2 also explores recent interregional migration and commuting patterns.

Section 3. Trade Flows and Economic Output. The value of commodities and services exports by SW to other regions and imports to SW from other regions is explored here, as are trade flows occurring among SW boroughs and census areas. Economic output, a comprehensive measure of an economy's size, is compared across the four Alaska regions.

Section 4. Commercial Fisheries. This section analyzes the importance of commercial fishing to the Southwest economy from a number of perspectives: weight and value of seafood landings by SW region port; ex-vessel value of shore-based fisheries; distribution of ex-vessel value by permit holder region of residence; wholesale values of at-sea and shore-based SW fisheries; and the distribution of shore-based seafood processing jobs and wages by region of residence.

Section 5. Waterborne Commerce. Total domestic and international waterborne exports from and imports to SW ports are examined at various levels of disaggregation, with a focus on the region's exports of seafood products relative to state totals.

Section 6. Maritime Commerce. This section identifies the strategic importance of the Aleutians to international maritime commerce, as well as potential expansion of Arctic development.

Section 7. Alaska Marine Highway System. Utilization of AMHS for travel and commodity transport within SW and between SW and ARR is documented here.

Section 8. Air Transport. This section analyzes the use of air transport for the movement of people, freight, and mail to and from SW.

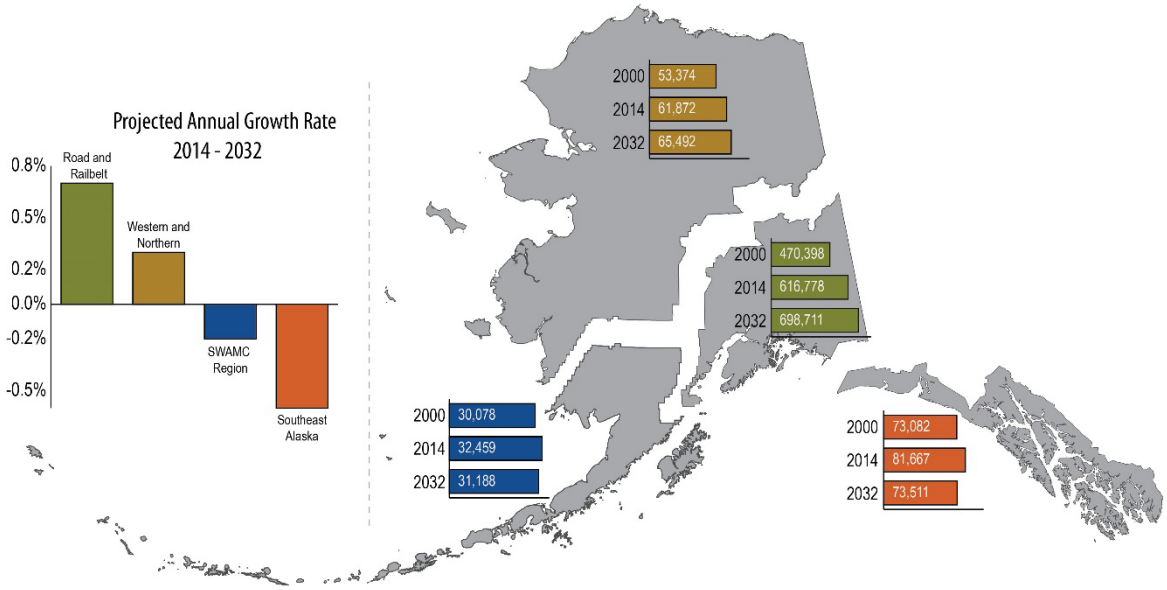
Section 9. Tourism. This section highlights the contributions of tourism to the economy of SW.

2 Demographics and Interregional Movements

2.1 Population

SW's population was 32,459 in 2014, or four percent of the population of the state as a whole, and just over half that of the next least populous region, WN. As shown in Figure 3, each of the four regions experienced positive population growth from 2000–2014, with the greatest year-on-year growth occurring in ARR. Of the four regions, however, the Alaska Department of Labor and Workforce Development (ADOLWD) has predicted that only WN and ARR will experience net population gains from 2014 to 2032, with SW and SE losing population at annual average rates of around 0.2 percent and 0.5 percent, respectively (see column chart on left of Figure 3).

Figure 3. Historical and Forecasted Population by Region

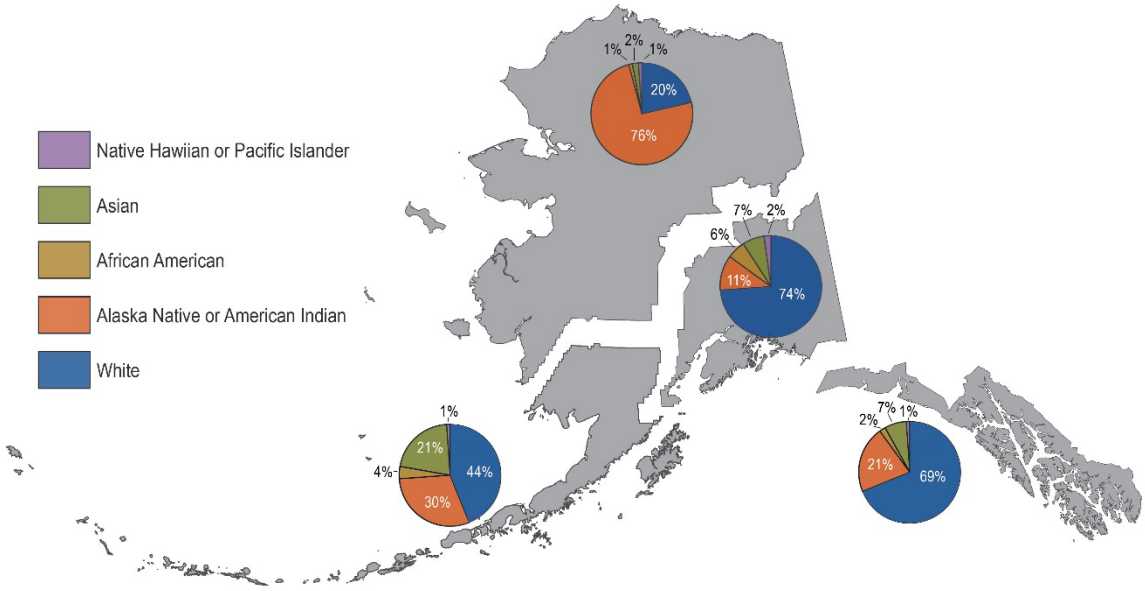


Source: Developed by Northern Economics based on data from ADOLWD (2015b).

Across the state as whole, white residents were the largest racial group in 2014 (67 percent of the population), followed by those self-identifying as Alaska Native or American Indian (15 percent), two or more races (7 percent), Asian (6 percent), black or African American (4 percent), and Native Hawaiian or other Pacific Islander (1 percent). In addition, seven percent of Alaska residents self-identified as Latino or of Hispanic origin in 2014.

The four regions are highly variable with respect to racial and ethnic composition, as depicted in Figure 4. Across SW, no race represents a majority, with white residents constituting 44 percent of the population, followed by those self-identifying as Alaska Native or American Indian (30 percent), Asian (21 percent), black or African American (4 percent), and Native Hawaiian or other Pacific Islander (1 percent). WN is the most dissimilar of the other three regions, where more than three-quarters of the population was Alaska Native or America Indian in 2014, compared to 11 percent in ARR and 21 percent in SE (ADOLWD 2015).

Figure 4. Ethnic and Racial Composition by Region, 2014



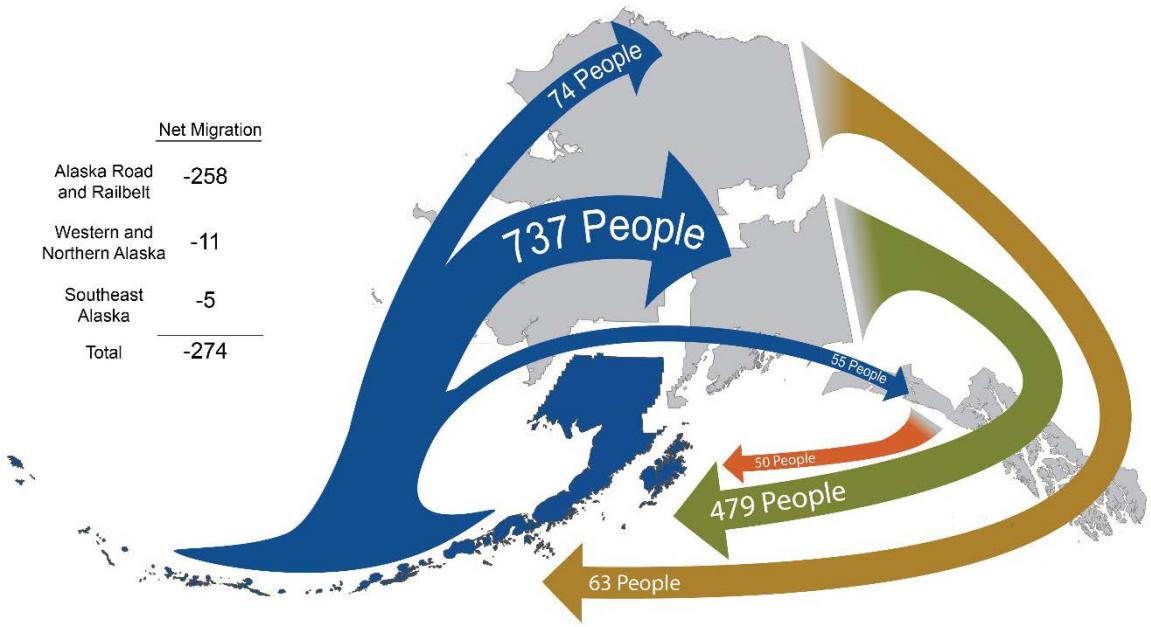
Source: Source: Developed by Northern Economics based on data from ADOLWD (2015b).

2.2 Migration Patterns

Analysis of interregional migration patterns likely helps explain forecasted net declines in the SW population over the next decade or two. Over the years 2009–2014, more people moved from SW to each of the other three regions of the state than from these regions to SW. These net deficits in interregional migratory flows are illustrated in Figure 5, with average annual net change in population due to migration over the years 2009–2014 shown on the left side of the graphic. While SW experienced modest net losses in movements of residents from the region to SE and WN over this time period, average annual net losses in population to ARR totaled 258 people. Table 1 and Table 2 detail year-by-year in-migration and out-migration flows, respectively, between SW and Alaska's other three regions.

Certainly, attributing predicted net population losses entirely to interregional migration within Alaska obscures the influence of other components of population change, such as migratory flows between SW and other states and foreign countries, birth rates, and the age composition of the region's residents. However, even when one removes interregional migration data from the context of the larger story of population change, SW's net population losses due to out-migration are not insignificant.

Figure 5. Average Annual In- and Out-Migration, SW, 2009–2014



Source: Developed by Northern Economics based on data from ADOLWD (2015a).

Table 1. Annual In-Migration to SW, 2009–2014

From	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	Average, 2009–2014
ARR	528	491	467	440	467	479
SE	70	53	45	46	37	50
WN	67	77	51	56	63	63
Total, All AK	665	621	563	542	567	592

Source: Developed by Northern Economics based on data from ADOLWD (2015a).

Table 2. Annual Out-Migration from SW, 2009–2014

To	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	Average, 2009–2014
ARR	742	639	673	801	832	737
SE	59	57	57	51	53	55
WN	95	67	68	69	70	74
Total, All AK	896	763	798	921	955	867

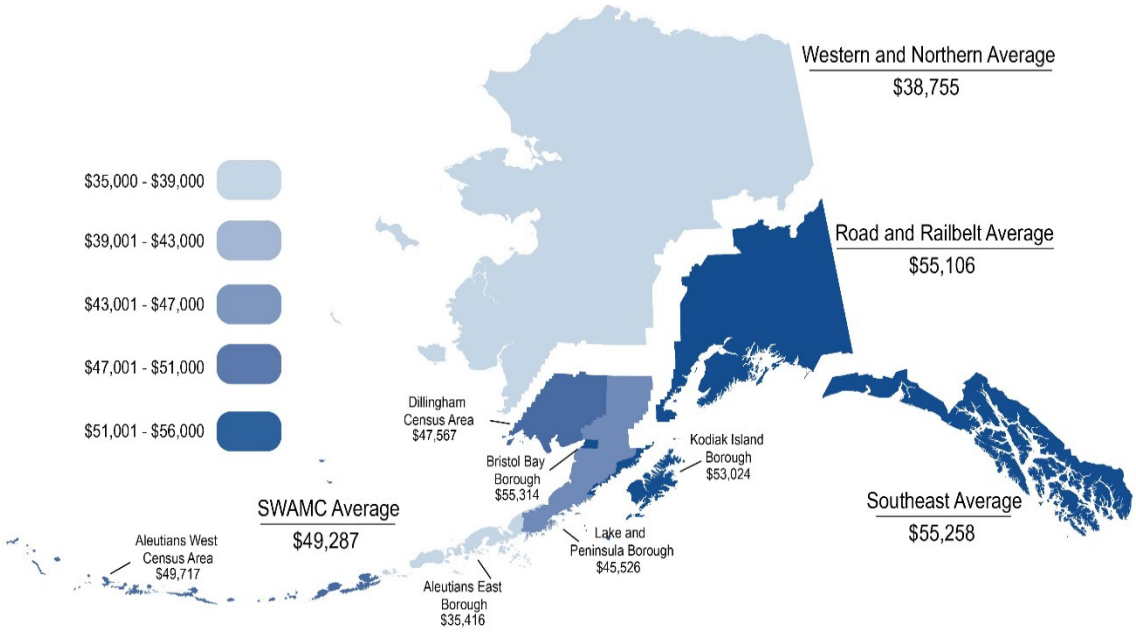
Source: Developed by Northern Economics based on data from ADOLWD (2015a).

2.3 Income

Average annual per capita income among residents across the four regions varies somewhat, with annual income (in 2014 dollars) from 2010–2014 highest in SE and ARR at $55,258 and $55,106, respectively. Average per capita income falls off somewhat in SW to $49,287 and even more sharply in WN, to $38,755. Per capita income over this five-year period was highly inconsistent across SW's constituent boroughs and census areas, as shown in Figure 6. Residents of Bristol Bay Borough enjoyed the highest income during this period, at over $55,000. Average annual per capita income among each of the other boroughs and census areas was greater than $45,000, except in Aleutians East Borough, where it was $35,416 (Bureau of Economic Analysis [BEA] 2015).

There are three important characteristics of the BEA's measure of per capita income. First, the Agency reports per capita income by place of residence rather than place of work. Second, the BEA's measure of income is comprehensive and includes not just net earnings from wage and salary disbursements and other labor income, but also personal dividend income, personal interest income, rental income, and transfer payments by federal, state, and local governments and businesses. Finally, BEA's per capita income figures include proprietors' income, while income measures of the U.S. Census Bureau and Bureau of Labor Statistics (BLS) do not.

Figure 6. Average per Capita Income by Region and SW Borough/Census Area, 2010–2014



Source: Developed by Northern Economics based on data from BEA (2015).

Real per capita income (in 2014 dollars) varied somewhat by year and region from 2010–2014, although all four regions experienced increases in real per capita income (see Table 3). Similar fluctuations were experienced over this period within SW's boroughs and census areas, although each area experienced a pronounced increase in real per capita income between 2010 and 2014 (see Table 4). Across all of SW, the increase in real per capita income from $46,847 in 2010 to $51,027 in 2014 translates to average annual growth of 2.2 percent, far outpacing the state average annual growth in real per capita income over this time period of 0.6 percent.

Table 3. Per Capita Personal Income by Region (2014 dollars)

Region	2010	2011	2012	2013	2014	Average, 2010–2014
ARR	54,575	55,875	56,333	53,387	55,373	55,106
SE	53,515	55,224	56,495	54,675	56,346	55,258
SW	46,847	48,828	50,769	48,897	51,027	49,287
WN	38,033	38,997	39,614	37,776	39,338	38,755
Average, Alaska	52,832	54,160	54,779	52,085	54,012	53,574

Source: Developed by Northern Economics based on data from BEA (2015)

Table 4. Per Capita Personal Income by SW Borough/Census Area, 2010–2014 (2014 dollars)

Borough/Census Area	2010	2011	2012	2013	2014	Average, 2010–2014
Aleutians East Borough	33,863	35,761	34,584	35,841	36,946	35,416
Aleutians West CA	44,712	48,187	51,609	50,888	53,010	49,717
Bristol Bay Borough	52,354	52,350	55,150	57,513	59,603	55,314
Dillingham CA	45,009	47,062	47,788	47,704	50,212	47,567
Kodiak Island Borough	51,530	52,961	55,285	51,515	53,792	53,024
Lake and Peninsula Borough	42,377	45,397	48,279	44,797	46,787	45,526
Average, SW	**46,847**	**48,828**	**50,769**	**48,897**	**51,027**	**49,287**

Source: Developed by Northern Economics based on data from BEA (2015).

The BEA also reports per capita income statistics by sector of employment. Table 5 provides average real per capita income for residents of each of the four Alaska regions, as well as the state as whole, on a sector-specific basis over the time period 2010–2014. Across the state as a whole, individuals employed in the Federal Government sector enjoyed the highest per capita income, followed by those employed in the Professional Management and Financial Services, State and Local Government, Transportation and Utilities, and Resource Extraction and Manufacturing sectors. SW residents employed in the government sectors also enjoyed the highest per capita income, while those with Resource Extraction and Manufacturing jobs—which include seafood harvesting and processing jobs—reported incomes far lower than the state average. This sector list, which Northern Economics developed specifically for this study, may be inconsistent with sector lists from other economic reports and analyses.

Table 5. Average Annual Wages by Sector and Region of Residence, 2010–2014 (2014 dollars)

Sector	AK	ARR	SE	SW	WN
Accommodations, Food Services, Arts & Entertainment	23,777	23,965	21,235	22,842	31,133
Construction	66,454	66,896	54,029	50,585	60,594
Federal Government	91,226	91,499	100,337	86,402	55,594
Healthcare and Social Assistance	57,965	57,276	52,037	65,976	66,192
Other Services	26,362	25,629	25,686	29,174	51,960
Professional Management and Financial Services	82,939	93,569	43,633	30,238	57,515
Resource Extraction and Manufacturing	71,201	74,296	30,108	41,575	121,175
State and Local Government	77,840	79,952	83,901	71,500	69,882
Transportation and Utilities	74,480	79,636	51,924	58,645	59,746
Wholesale and Retail Trade	37,427	38,982	30,853	30,021	27,993
Average, All Sectors	58,111	58,125	49,210	52,476	76,356

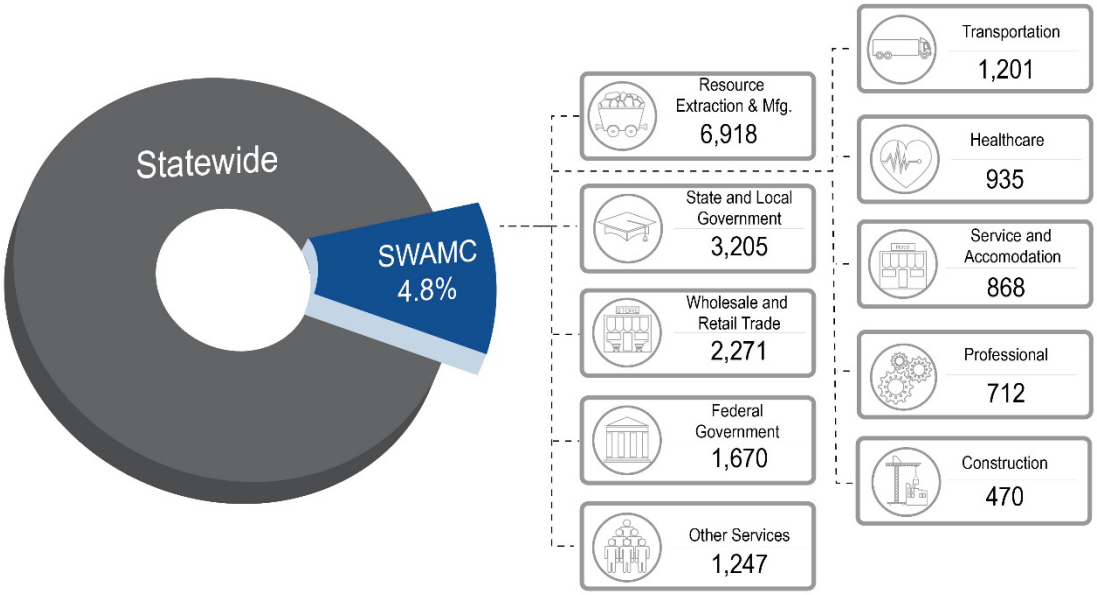
Source: Developed by Northern Economics based on data from BEA (2015).

2.4 Employment Overview

2.4.1 Employment by Region of Residence

SW residents held 4.8 percent of all jobs held by Alaskans over the years 2010–2014, as reported by the BEA. Importantly, the BEA's job counts are by place of residence, regardless of job location, and consider jobs of all types—full-time, part-time, seasonal, etc.—equally as one job each. In addition, an individual may hold multiple jobs in a single year, with each job counted separately. Figure 7 depicts SW residents' share of all jobs held by Alaskans over the five-year period ending in 2014, as well as the average annual distribution of these jobs across 10 broad sectors. Notably, the Resource Extraction and Manufacturing sector—which includes seafood harvesting and processing—provided 35 percent of total jobs, although many of these jobs are seasonal. The study team believes that seafood harvesting jobs are understated in the BEA counts, as these jobs are seldom reported for fishers who do not receive a W-2 or 1099. Further, Northern Economics has not augmented the BEA estimates with independent estimates of fish harvesting workers. Thus, this sector is an even more important employer of SW residents than is indicated in the BEA statistics. Government also was an important employer of SW residents, with average annual employment across federal, state, and local levels totaling close to 5,000 jobs.

Figure 7. Average Annual Employment of SW Residents by Sector, 2010–2014



Source: Developed by Northern Economics based on data from BEA (2015).

SW residents' employment within the Resource Extraction and Manufacturing sector from 2010–2014 was disproportionately high relative to the region's population, with the annual average of 6,918 jobs accounting for more than 14 percent of all jobs held by Alaskans in this sector (see Table 6). The other two sectors in which SW residents' share of total employment of all Alaskan residents exceeded the region's 4.0 percent share of total population (in 2014) were Transportation and Utilities and State and Local Government. As shown in the bottom row of Table 6, average annual growth in total jobs held by SW residents outpaced that of the state as a whole from 2010–2014 and was exceeded only by WN.

Table 6. Average Annual Employment by Sector and Region of Residence, 2010–2014

Sector	AK	ARR	SE	SW	WN	SW % of Total
Accommodations, Food Services, Arts & Entertainment	43,249	34,306	4,751	868	1,533	2.0
Construction	24,220	20,101	2,399	470	359	1.9
Federal Government	43,628	38,417	2,791	1,670	729	3.8
Healthcare and Social Assistance	48,827	39,265	4,140	935	686	1.9
Other Services	69,377	56,018	4,443	1,247	3,626	1.8
Professional Management and Financial Services	30,162	23,125	2,174	712	506	2.4
Resource Extraction and Manufacturing	48,648	18,442	3,468	6,918	10,520	14.2
State and Local Government	69,850	43,529	11,832	3,205	10,519	4.6
Transportation and Utilities	25,482	19,138	2,492	1,201	1,856	4.7
Wholesale and Retail Trade	51,589	41,581	5,493	1,269	2,271	2.5
Total	456,163	339,361	52,519	22,075	39,813	4.8
Avg Annual Growth in Total Employment, 2010–2014	1.2%	1.0%	1.2%	1.6%	2.4%	

Source: Northern Economics analysis of data from BEA (2015).

In contrast to the BEA, the BLS tracks employment by place of work, largely through the Quarterly Census of Employment and Wages (QCEW).[3] QCEW data are tabulations of monthly employment and quarterly wages of workers who are covered by state unemployment insurance programs or by the unemployment insurance programs for federal employees. Importantly, QCEW excludes members of the armed forces, the self-employed, proprietors, domestic workers, and a few other job categories. The exclusion of the self-employed and proprietors is an important consideration because of the high number of jobs in SW fisheries that fit into these two categories. The QCEW's understatement of fish harvesting jobs is exhibited by its reporting of an average monthly job total of 59 for Kodiak Island Borough's Fishing, Hunting, and Trapping sector in 2014 (BLS 2015). For sectors other than Resource Extraction and Manufacturing, however, QCEW job counts provide for comparison of region-specific contributions to employment totals.

[3] ADOLWD employment estimates generally rely on QCEW data and correspond more closely to BLS data than BEA data.

Unsurprisingly, ARR is the largest employer by place of work across all sectors, as shown in Table 7. Further, even with the exclusion of self-employment and proprietorship totals, regional QCEW job counts aggregated across all sectors indicate that jobs located within SW accounted for more than five percent of all jobs held statewide over the years 2010–2014.

Table 7. Average Employment by Sector and Region of Work, 2010–2014

	Region of Work					
Sector	AK	ARR	SE	SW	WN	Unknown
Accommodations, Food Services, Arts & Entertainment	32,989	26,782	3,315	481	958	20
Construction	16,378	13,732	1,280	273	176	76
Federal Government	16,270	13,759	1,641	517	334	19
Healthcare and Social Assistance	44,513	35,537	3,441	839	721	136
Other Services	30,323	23,489	1,963	573	2,619	295
Professional Management and Financial Services	30,554	25,989	1,818	367	463	491
Resource Extraction and Manufacturing	31,345	10,836	1,990	4,358	8,537	171
State and Local Government	65,461	39,773	11,604	3,252	10,789	46
Transportation and Utilities	21,494	16,219	2,139	877	1,364	56
Wholesale and Retail Trade	42,286	34,207	4,337	965	1,789	187
Total Industries	331,612	242,993	37,209	17,006	32,909	1,496

Source: Developed by Northern Economics based on QCEW data from BLS (2015).

2.5 Commuting Patterns

Analysis of commuting patterns between SW and the other regions of the state reveals that more non-SW Alaska residents commute to SW for jobs than the number of SW residents who commute to jobs outside their home region. This net importation of workers suggests that SW offers ample employment opportunities to residents of the other regions of Alaska. In contrast to the traditional definition of a commuter as someone who travels daily from her area of residence to a distinct area of employment, this analysis considers someone a commuter if she reports residence in one borough, census area, or municipality and is employed in another. The vast majority of commuters counted in this analysis travel from their areas of residence to distinct areas of employment for extended periods of time. In addition, an individual can be counted as a commuter multiple times: commuter counts are derived from monthly QCEW counts of workers, and a worker who holds multiple jobs outside her borough, census area, or municipality of residence over the course of a year will be counted as a commuter multiple times. The QCEW captures workers' social security numbers, which allows for place of employment to be related to place of residence by tying workers' social security numbers to place of residence as reported in their Permanent Fund Dividend (PFD) applications. Further, an individual is considered a single commuter regardless of how many months over the course of a year she is counted as being employed outside her area of residence. Figure 8 shows the numbers of SW residents commuting to the other three regions and residents of these regions commuting to SW in 2014; the study team considers it unlikely that the net importation result is anomalous relative to other years.

Figure 8. Number of Commuters to and from SW, 2014

Source: Northern Economics analysis of commuting pattern data from ADOLWD (Robinson 2015).

A comprehensive picture of interregional commuting patterns for a state incorporates the influx of workers who reside outside the state, as well as the outflow of workers to jobs located outside the state. Table 8 is a matrix of interregional commuting totals that includes not only residents of the four Alaska regions, but also Alaska residents living outside the state (termed "Ex-AK") and a final group composed of non-Alaska residents and people who live in Alaska but who have not been residing in the state long enough to file for a PFD (termed "DNA" for "Did Not Apply"). The table also includes the estimated number of residents of these six regions working offshore. The far right column identifies the large numbers of non-Alaska residents working in each of the regions of the state. These out-of-state residents hold more jobs in SW than even the region's residents themselves. Upon observation of the columns for each of the four geographic regions of the state, it is apparent (and unsurprising) that most residents of a particular region tend to also work in that region.

Table 8. Interregional Commuter Counts, FTE Equivalents, 2014

Region of Work	Region of Residence					
	ARR	SE	SW	WN	Ex-AK	DNA
ARR	243,124	1,508	1,026	1,753	931	66,810
SE	2,185	34,025	133	82	160	15,753
SW	2,074	170	12,064	167	54	16,753
WN	15,840	426	240	25,893	112	14,932
Offshore	251	70	59	28	-	3,240
Ex-AK	1,268	39	16	6	11	1,556
Unknown	725	40	20	26	6	312

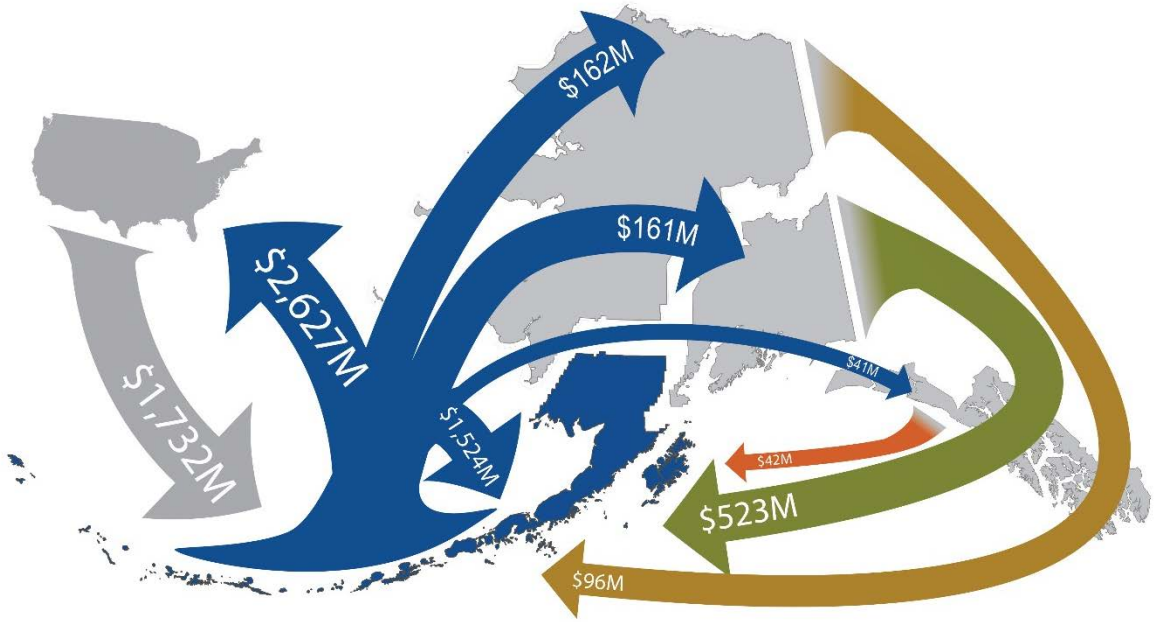
Source: Northern Economics analysis of commuter data from ADOLWD (Robinson 2015).

3 Trade Flows and Economic Output

3.1 Trade Flows

Interregional trade flows measure the value of commodities and services produced in one region and exported to another region. While empirical data that inform the development of interregional trade flow estimates for Alaska are limited, the estimates provided in Figure 9 reveal the vast importance of SW's trade with areas of the country outside Alaska. Indeed, according to the trade flow export estimates provided by IMPLAN, the total value of commodities and services exported from SW to the rest of the U.S. in 2014 was roughly ten times the combined value of exports to the other three regions of the state. Moreover, IMPLAN estimates that in 2014 more than 80 percent of SW's exports to the rest of the U.S. fell into the commodity category labeled "Food Products." Without additional detail regarding the type of food products, one can safely conclude that seafood products constitute the vast majority, if not all, of the more than $2 billion in exports from SW to the rest of the U.S. Meanwhile, SW imported more than $1.7 billion of commodities and services from the rest of the U.S. in 2014, although the composition and value of the constituent imports is less certain than the seafood exports. SW also experienced a net trade flow deficit with ARR in 2014, with the total value of imports more than triple that of exports. According to the IMPLAN estimates, SW's top import from ARR by value was "Petroleum and coal products." Figure 9 further indicates the importance of intraregional trade flows to SW, i.e. the trade of commodities and services between SW's boroughs and census areas, as evidenced by the more than $1.5 billion of commodities and services both produced in and sold within the region. Figure 9 shows only inter- and intraregional trade flows for SW and not trade flows between and within other regions.

Figure 9. Inter- and Intraregional Trade Flows, SW, 2014



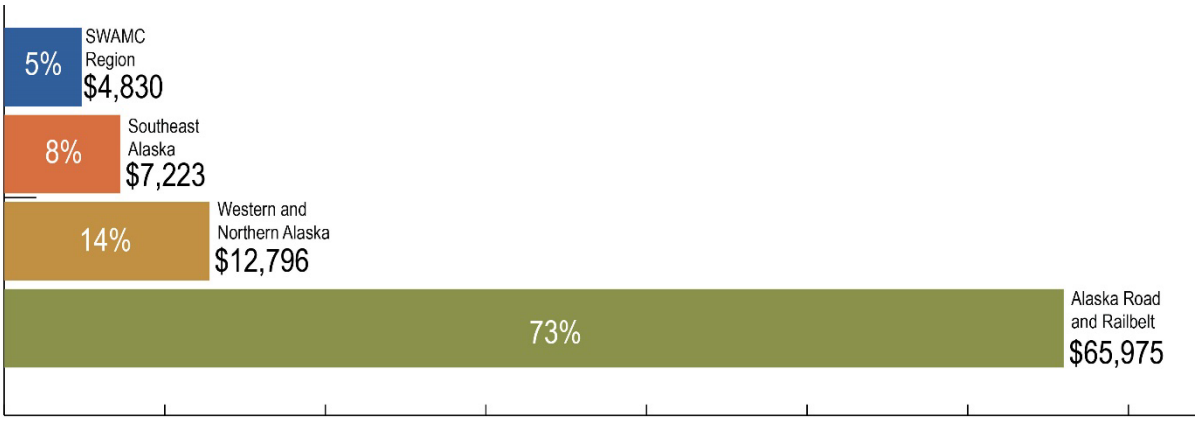
Source: Developed by Northern Economics based on data from IMPLAN (2016).

3.2 Output

Economic output (or just output) is one measure of the overall size, or value, of an economy and refers to the total value of sales of products and services to final users in an economy (i.e. value added) plus sales of intermediate inputs.[4] Gross domestic product, on the other hand (or, for a regional economy, what is often referred to as Gross Regional Product [GRP]), represents only value added, i.e. the sum of employee compensation, taxes on production and imports, and gross operating surplus, less subsidies. It is important to draw the distinction between output and GRP, because both are commonly used as measures of an economy's size and because, unlike GRP, output allows for the potential for double-counting (BEA 2014). An example of the difference between the two measures is that of a crab that is harvested from SW waters, sold by the crab fisher to a processing company at a SW dock, and then processed and sold at wholesale value from the processing company's plant located in SW. A calculation of output associated with the crab would sum the crab's ex-vessel value and wholesale value, while GRP would subtract the ex-vessel value. If the crab were also retailed at a grocery store within SW, the ex-vessel and wholesale values would be added to the retail price in the calculation of output, while GRP would exclude both the ex-vessel and wholesale prices.

Figure 10 shows each region's share of statewide economic output in 2014, as well as total value of output for each region. SW's output of just over $4.8 billion represented a little over five percent of statewide output in 2014, with ARR, WN, and SE contributing 73 percent, 14 percent, and 8 percent, respectively.

Figure 10. Economic Output by Region and Share of State Total, 2014 ($ million)



Source: IMPLAN 2016.

[4] This definition of economic output contrasts with a definition of direct economic output, which includes only the total value of sales of products and services to final users in an economy.

Table 9 provides additional detail regarding SW's contribution to total statewide output for Alaska's top ten sectors (ranked by output), as defined by IMPLAN, as well as other sectors that round out the list of SW's top ten sectors by output. Each sector's rank in terms of its contribution to statewide output is provided in the far left column, with actual output for each sector noted in the third column. The two columns furthest to the right identify SW's output by sector and the region's sector-specific percentage contribution to total state output. Of the sectors for which SW's contributions are left blank (all related to oil and gas drilling, production, transportation, and refining), the only sector for which SW's output was nonzero in 2014 was Petroleum refineries ($6 million). Notably, of total statewide output from the Seafood product preparation and packaging sector—whose output was ranked third overall for Alaska in 2014—SW's contribution of nearly $2.4 billion constituted more than two-thirds. Importantly, the data sources that inform IMPLAN's estimates of sectoral output do not capture output related to at-sea harvests and processing. SW's output from the Water transportation and Commercial fishing sectors also were significant relative to respective statewide totals, with each exceeding 20 percent.

Table 9. Select Top Sectors by Output, State of Alaska, and SW Contribution to State Total, 2014

AK Rank	Sector	AK Output ($Millions)	SW Output ($Millions)	SW Share of State Total (%)
1	Extraction of natural gas and crude petroleum	12,129		
2	Pipeline transportation	3,692		
3	Seafood product preparation and packaging	3,464	2,353	68
4	Owner-occupied dwellings	3,356	129	4
5	Petroleum refineries	3,156		
6	Real estate	2,804	166	6
7	Employment and payroll of federal govt, military	2,799	128	5
8	Support activities for oil and gas operations	2,180		
9	Air transportation	2,067	119	6
10	Drilling oil and gas wells	2,018		
14	Hospitals	1,838	108	6
15	Employment and payroll of local govt, education	1,834	121	7
17	Employment and payroll of local govt, non-education	1,342	115	9
20	Water transportation	1,163	248	21
40	Commercial Fishing	550	126	23
	Total	**90,823**	**4,830**	**5.3**

Source: IMPLAN 2016.

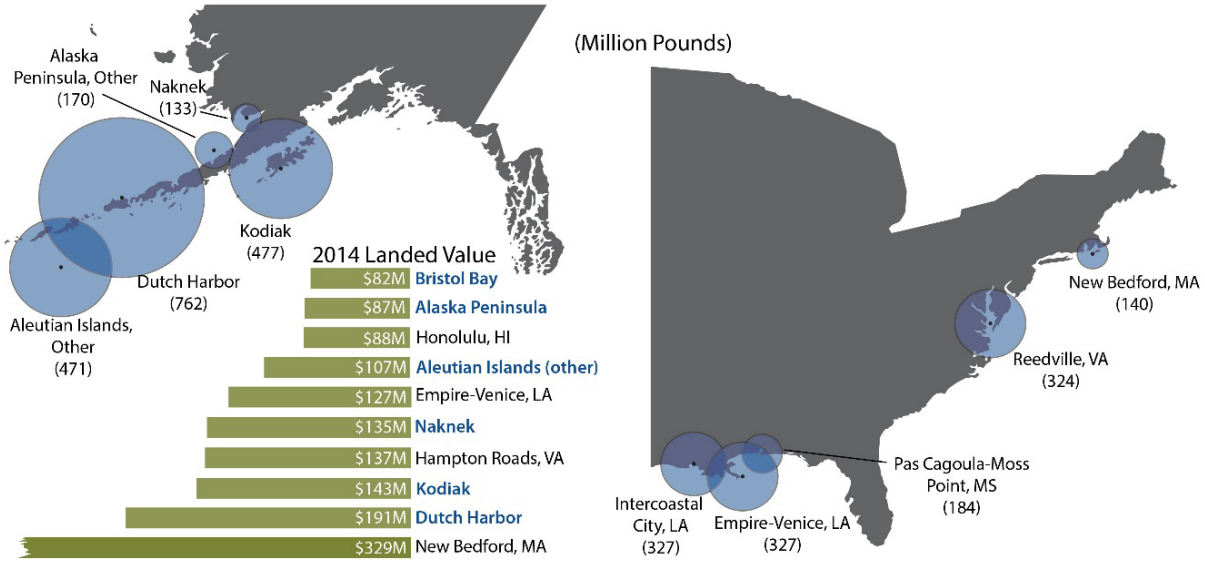
4 Economic Impacts of SW Commercial Fisheries

4.1 Total Harvest Volumes by SW Port

In 2014, SW was home to five of the top ten ports in terms of pounds of commercial seafood landings, including the top three in Dutch Harbor (762 million pounds), Kodiak (477 million pounds), and Aleutian Islands (Other) (includes Akutan, Adak, Saint Paul, and Atka; 471 million pounds). The other two SW ports in the top ten were Alaska Peninsula (Other) (includes King Cove, Sandpoint, Chignik, and False Pass; 170 million pounds) at number eight and, at number ten, Naknek (includes King Salmon; 133 million pounds). In addition, Bristol Bay, which is ranked twenty-second in terms of weight of seafood landings but tenth in terms of value, includes Dillingham and other areas outside Bristol Bay Borough. The prominence of these SW ports in the 2014 list of top U.S. ports by pounds of commercial fish landings is the norm and indicates the vast importance of commercial fishing in SW waters to the region, state, and country (NMFS 2015). Figure 11 identifies the top U.S. ports by weight of commercial seafood landings in 2014, with the areas of the circles corresponding to ports' landings by weight.

The ex-vessel values of these fish landings attests directly to the economic importance to the regional and state economies of commercial fishing in SW waters. The bar chart in the lower left quadrant of Figure 11 shows the top ten U.S. ports by ex-vessel value of seafood landings in 2014, with six of these ten (Dutch Harbor, Kodiak, Naknek, Aleutian Islands (Other), Alaska Peninsula, and Bristol Bay) located in SW. SW ports accounted for 48 percent of the total weight of seafood landings across the top 20 U.S. ports (ranked by weight of seafood landings) in 2014 and 37 percent of the total value of seafood landings across the top 20 ports (ranked by value of seafood landings) (NMFS 2015).

Figure 11. Top US Ports by Weight and Value of Seafood Landings, 2014



Source: Developed by Northern Economics based on data from NMFS (2015).

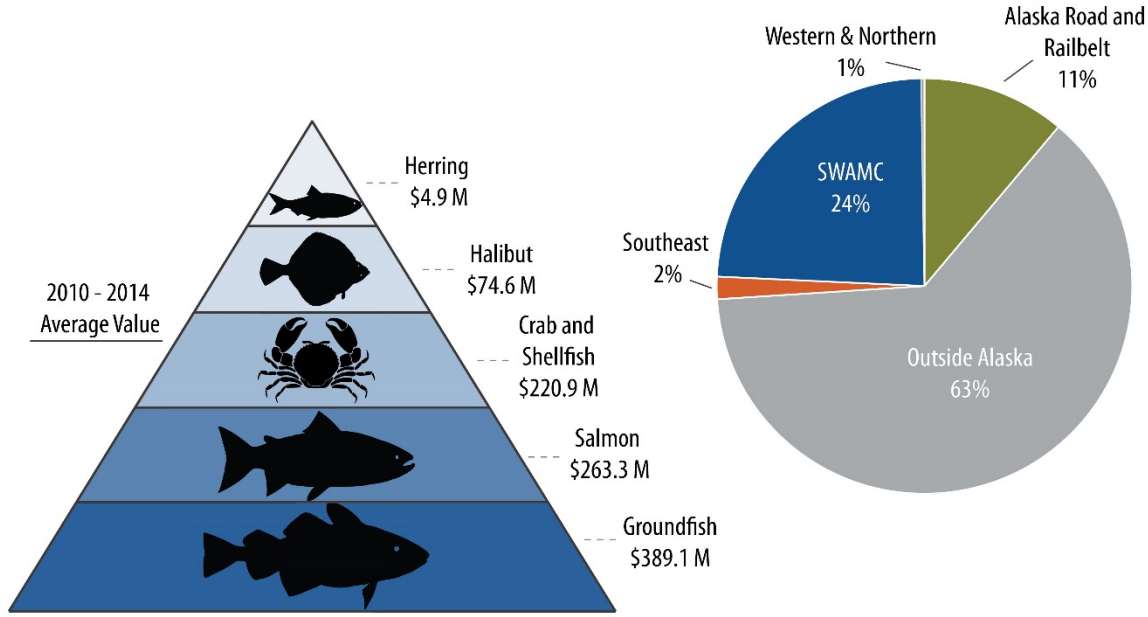
4.2 Ex-Vessel and Wholesale Value

4.2.1 Shore-based Ex-Vessel Value by SW Fishery

Several fisheries generate the total ex-vessel value of shore-based seafood landings at SW region ports. The pyramid in Figure 12 disaggregates by fishery the average annual (2010–2014) total ex-vessel value of shore-based deliveries across SW region fisheries. Over the five-year period, the shore-based groundfish fishery generated the greatest revenue, with an annual average (nominal) value of $389.1 million. Average annual ex-vessel revenues generated by the salmon and crab and shellfish fisheries exceeded $200 million, while the halibut and herring fisheries contributed annual averages of just under $74 million and $5 million, respectively.

The study team estimates that SW residents took home 24 percent of these shore-based fishery ex-vessel revenues over the years 2010–2014, with non-Alaska, ARR, SE, and WN residents collecting 63 percent, 11 percent, 2 percent, and 1 percent of revenues, respectively. The pie chart in Figure 11 depicts this distribution of shore-based ex-vessel revenues by region of residence, which the study team estimated for the salmon, crab and shellfish, halibut, and herring fisheries based on permit holders' regions of residence. For the groundfish fishery, the study team estimated allocation of revenues based on the region in which the vessels harvesting and delivering the fish were registered. This is because there tends to be a less direct link between permit holder residence and residence of the primary recipient of ex-vessel revenue in the groundfish fishery than the other four fisheries.

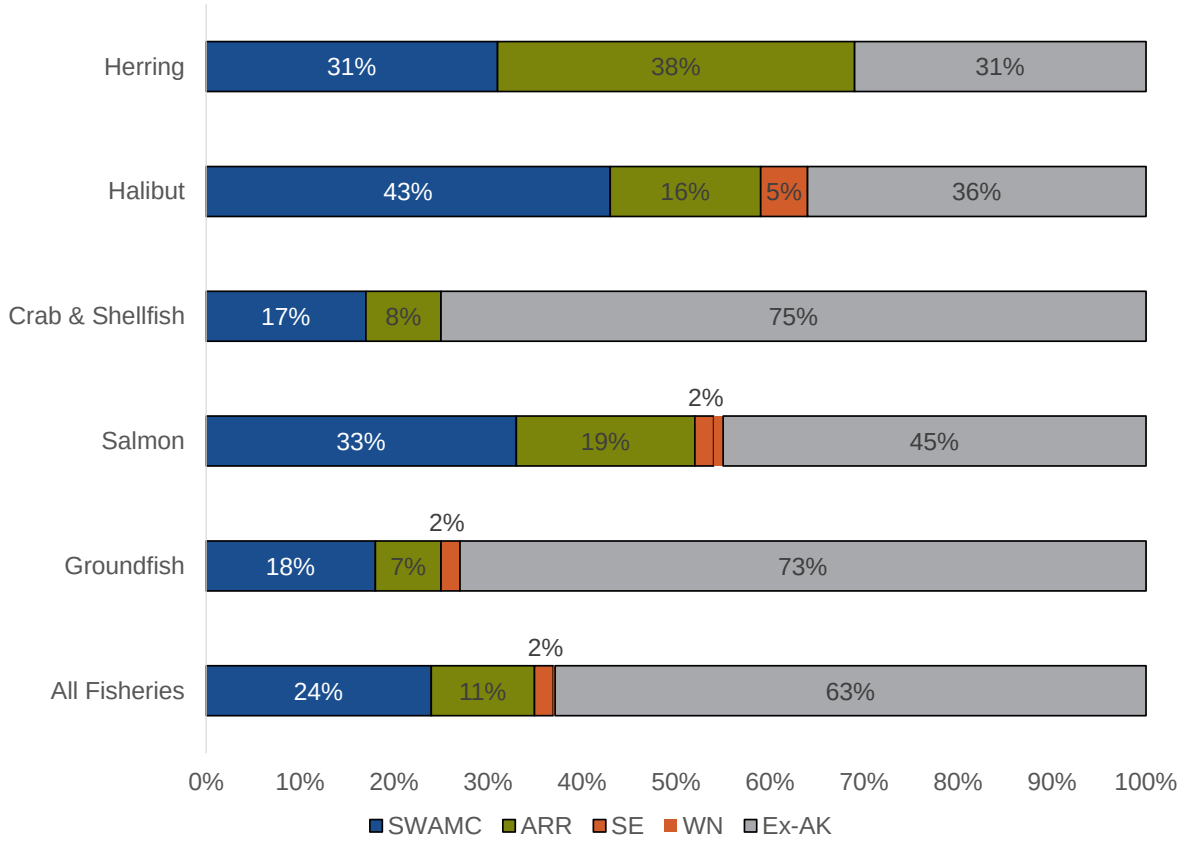
Figure 12. Average Annual Ex-Vessel Value of Shore-Based Landings by SW Fishery and Distribution of Ex-Vessel Value by Permit Holder Place of Residence, 2010–2014



Source: Developed by Northern Economics based on data from CFEC (Goh 2016) and Alaska Fisheries Information Network (AKFIN) (Fey 2016).

The study team further estimated the regional distribution of ex-vessel revenue for each fishery for the years 2010–2014. As shown in Figure 13, this analysis considered five regions: the four regions of Alaska and a region comprising all areas outside the state. SW shore-based fisheries generated significant ex-vessel revenues for non-Alaskan permit holders, as well as permit holders residing in SW, but also substantial revenues for ARR resident permit holders. As shown in Figure 13, this analysis estimates that non-Alaskan permit holders earned 63 percent of ex-vessel revenues across the five shore-based fisheries over the years 2010–2014. Non-Alaskans' share of ex-vessel revenues are particularly high in the groundfish and crab and shellfish fisheries, at 73 percent and 75 percent, respectively. In comparison, SW resident permit holders earned just under one-quarter of revenues across the five fisheries. SW resident permit holders' share of ex-vessel revenues in the halibut fishery (43 percent) was greater than that of any other region's residents and higher than SW residents' share of revenues for the other four fisheries. SW resident permit holders earned over 30 percent of ex-vessel revenues in both the salmon and herring fisheries but less than 20 percent in the groundfish and crab and shellfish fisheries. Meanwhile, ARR resident permit holders earned an estimated 11 percent of all ex-vessel revenues across the five fisheries.

Figure 13. Average Distribution of Ex-Vessel Revenue by Permit Holder Region of Residence, 2010–2014

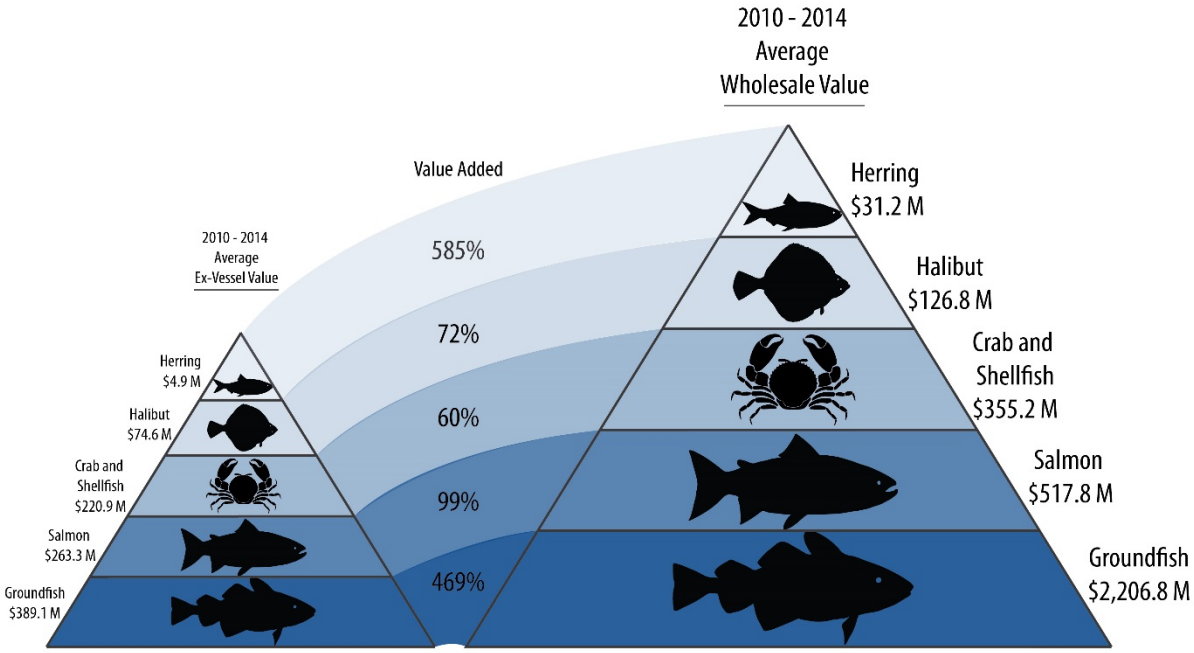


Source: Developed by Northern Economics based on data from CFEC (Goh 2016) and AKFIN (Fey 2016).

4.2.2 Wholesale Values

In conjunction with the Alaska Fisheries Information Network (AKFIN), Northern Economics estimated the wholesale values of each of the shore-based fisheries whose ex-vessel values are provided above, as well as the at-sea groundfish and herring fisheries (see Figure 14). For the salmon, crab and shellfish, halibut, and herring fisheries, the wholesale values indicate that shore-based processing adds substantial value to the product, above the ex-vessel value. The more than 400 percent increase from the ex-vessel value to wholesale value of the groundfish fishery attests to both the considerable value added to shore-based deliveries through processing and the significant wholesale value of the at-sea groundfish fishery. Moreover, a portion of the large margins between ex-vessel and wholesale values are attributable to a high number of shore-based seafood processing jobs held in SW. These jobs, which are a significant source of employment for Alaskan and non-Alaskan residents, are documented in greater detail in the next section.

Figure 14. Average Ex-Vessel and Wholesale Values of SW Fisheries, 2010–2014

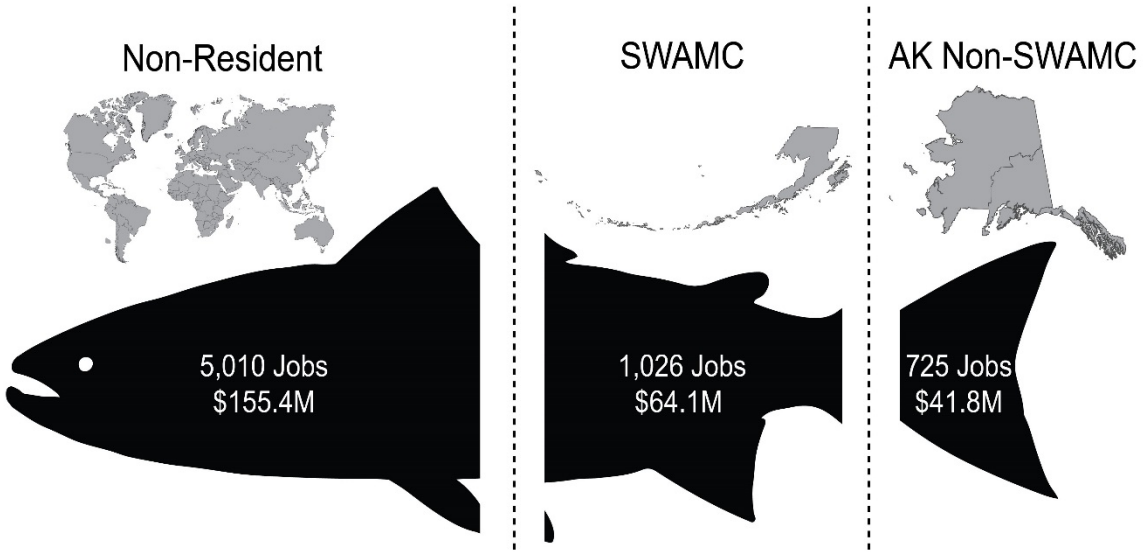


Source: Developed by Northern Economics based on data from CFEC (Goh 2016) and AKFIN (Fey 2016).

4.3 Shore-based Fish Processing Employment

Fish harvesting jobs are just one component of the employment opportunities provided by the SW region seafood industry. Seafood processing jobs also are important sources of employment and income to thousands of SW region, other Alaskan, and non-Alaskan residents. Figure 15 shows the average annual allocation of jobs and wages (in 2014 constant dollars) provided by SW region shore-based seafood processing jobs over the years 2010–2014 across residents of three regions: non-Alaska residents, SW residents, and non-SW Alaska residents. As shown in the graphic, non-Alaska residents held nearly five times as many shore-based processing jobs as SW residents and nearly seven times as many jobs as non-SW Alaska residents over the five-year time period. However, average wages per job among SW and other Alaskan residents ($62,000 and $58,000, respectively) were significantly higher than averages wages per job among non-Alaska residents ($31,000). Table 10 and Table 11, meanwhile, provide the annual breakdown of jobs and total wages, respectively, for residents of the three regions over the five-year period.

Figure 15. Average Distribution of Shore-Based Seafood Processing Jobs and Wages by Region of Residence, 2010–2014



Source: Developed by Northern Economics based on data from ADOLWD (Robinson 2016).

Table 10. Fish Processing Jobs in SW, 2010–2014

Year	Local Jobs	AK Non-local Jobs	Non-Resident Jobs	Total Jobs
2010	982	694	4,683	6,358
2011	924	693	4,755	7,031
2012	1,082	721	5,138	6,939
2013	1,068	754	5,217	7,039
2014	1,073	764	5,259	7,096
Average, 2010–2014	1,026	725	5,010	6,893

Source: Developed by Northern Economics based on data from ADOLWD (Robinson 2016).

Table 11. Wages Paid by SW Fish Processing Jobs (2014 $Millions), 2010–2014

Year	Local Wages	AK Non-local Wages	Non-Resident Wages	Total Wages
2010	63.4	44.8	142.7	250.8
2011	64.4	48.3	158.9	271.6
2012	62.8	41.8	160.6	265.2
2013	64.6	45.5	156.4	266.4
2014	65.2	46.4	158.4	269.9
Average, 2010–2014	64.1	45.4	155.4	264.8

Source: Developed by Northern Economics based on data from ADOLWD (Robinson 2016).

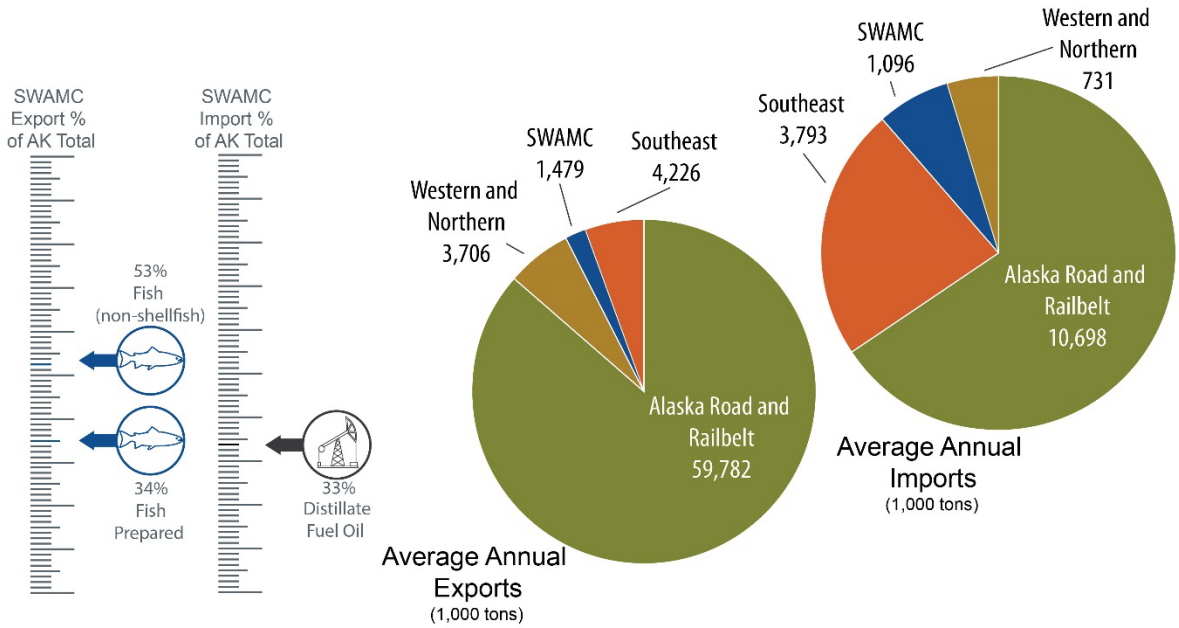
5 Waterborne Commerce

Waterborne trade, both domestic and international, is an important component of the SW economy, with large volumes of seafood products exported from and substantial volumes of petroleum products imported to the region. Through its Waterborne Commerce Statistics Center, the U.S. Army Corps of Engineers (USACE) publishes extensive data regarding both domestic and international waterborne transport of commodities. The international data provide commodity category, tonnage, and ports of both origin and destination for commodities imported to or exported from the U.S., while the domestic data offer commodity category, tonnage, and either port of origin (for exports) or destination port (for exports). This section disaggregates domestic and international waterborne exports and imports by tonnage and commodity type and, specifically for international exports and imports, identifies important international trade partners.

5.1 Domestic

Domestic waterborne exports from Alaska's four regions can be transported either to other regions of the state or to the Lower 48 states or Hawaii. Similarly, domestic imports need not be exported by other Alaskan regions, as they can originate from Lower 48 ports or Hawaii. When one compares the tonnage numbers in the export and import pie charts in Figure 16 , it is evident that, in terms of tonnage, Alaska is a net exporter in its waterborne trade with the rest of the U.S. By tonnage alone, domestic waterborne exports from SW account for a little over two percent of the state total. The further left pie chart in Figure 16 demonstrates SW's relatively small contribution to statewide average annual domestic waterborne exports over 2012–2013. However, it is important to point out that waterborne commerce data, by virtue of its presentation in tonnage, may distort the relative values of exports from each region.

Figure 16. Average Annual Domestic Waterborne Exports and Imports by Region, 2012–2013



Source: Developed by Northern Economics based on data from USACE (2015).

Table 12, which identifies domestic waterborne exports of highly aggregated commodity groups from Alaska and SW over the years 2012–2013, helps demonstrate that comparison of exports in terms of tonnage may distort an understanding of their relative values. A comparison of the relative values of a pound each of Alaskan crude and Bristol Bay sockeye helps clarify this point. By a large margin, the top waterborne commerce export by Alaska in terms of tonnage is crude and other petroleum products. A 42-gallon barrel of crude that weighs roughly 315 pounds and sells for $100 (far higher than current prices) equates to an average value per pound of $0.32. Meanwhile, the wholesale value of a pound of frozen headed and gutted sockeye from Bristol Bay is likely to be at least $2.50 (ADOR 2015), or nearly eight times the value of a pound of crude (again, assuming $100 per barrel of crude oil). Thus, one should view the domestic export pie chart in Figure 16 as no more than a rough approximation of the relative values of domestic waterborne exports from Alaska's four regions.

Despite the shortcomings of using weight as a surrogate for value, there are some SW domestic waterborne export statistics worth noting. The region's exports of seafood products accounted for 50 percent of the state total over 2012–2013. In addition, by tonnage alone, fish (other than shellfish) and prepared (processed) fish (not listed separately in Table 12) were the fifth and tenth largest domestic waterborne exports overall for Alaska over the years 2012–2013. The Seafood Products category includes Fish (not shellfish), Shellfish, Fish (prepared), Tallow and Animal Oils, and Animal Feed, but excludes manufactured Products "Not Elsewhere Classified" (NEC),[5] which for SW are likely nearly entirely seafood products.

Table 12. Top Alaska and SW Domestic Waterborne Exports, 2012–2013

	Annual Exports (1,000 tons)		
Commodity Group	Alaska	SW	SW % of AK Total
Crude and Other Petroleum Products	59,437	148	>0
Seafood Products	1,741	877	50
Other Commodities	8,015	454	6

Source: Developed by Northern Economics based on data from USACE (2015).

Importantly, commodities that show up as having been exported from a region are not necessarily produced in that region. This is due to the USACE's methodology for counting domestic waterborne exports and imports. Specifically, if a commodity is produced in and exported from one region of a state is transported to a port in another region of the same state and then again shipped (either to another region of the state or another state), the USACE counts that commodity as an export for both the region in which the commodity was produced and the region to which the commodity was first transported. That the USACE applies this methodology is important for two reasons: first, it allows for potential double-counting of domestically exported goods; and, second, it follows that not all commodities that show up as exports from a particular region are necessarily produced in that region.

As documented above, by tonnage alone, Alaska is a net exporter in terms of domestic waterborne trade. However, as shown in Table 13, three of the state's top four domestic waterborne imports from 2012 to 2013 were petroleum-based products, with fabricated metal products the second largest import. Notably, SW's domestic imports of distillate fuel oil constitute one-third of statewide domestic imports of the commodity. In terms of tonnage, this commodity also represented the top domestically imported commodity by a large margin. In addition, the region's domestic waterborne imports of paper products (other than newsprint and paper and paperboard) accounted for 37 percent of the state total,

[5] "Unknown or NEC" commodities are commodities of unspecified classification.

while its imports of unclassified non-metal minerals and sand and gravel accounted for 23 percent and 24 of respective statewide totals. SW's imports of these three commodities are not included in Table 13, as none of them ranked among the state's top ten imports over the two-year period.

Table 13. SW's Share of Top Alaska Domestic Waterborne Imports, 2012–2013

	Average Annual Imports (1,000 tons)		
Commodity Group	Alaska	SW	SW % of AK Total
Crude Petroleum	4,813	0	<1
Manufac. Prod. NEC	2,756	116	4
Gasoline	2,526	167	7
Distillate Fuel Oil	2,138	704	33
Groceries	789	3	<1
Cement & Concrete	490	1	<1
Lumber	275	5	2
Fab. Metal Products	266	30	11
Vehicles & Parts	245	2	1
Misc. Mineral Prod.	193	2	1
Other Commodities	1,827	30	2

Source: Developed by Northern Economics based on data from USACE (2015).
Note: The NEC commodity category captures all manufactured equipment, machinery, and products not belonging to one of the ten manufactured commodity group categories.

5.2 International

Unlike domestic waterborne export and import data, equivalent international data identify both the port of origin and destination. This provides for the clear identification of SW's international trade partners, both by tonnage and type of commodity. A comparison of Table 14 to Table 15 reveals that, in terms of tonnage, Alaska's international waterborne exports were 2.6 times greater than its imports over the years 2012–2014. Among the state's top exported commodity categories were fish and forest products, while petroleum products represented a large portion of imports. In addition, SW's share of statewide international waterborne exports greatly exceeded its share of domestic exports, while it trailed only ARR in terms of tonnage of international waterborne imports.

Table 14 and Table 15 also reveal SW's considerable contributions to total Alaskan international waterborne exports of seafood products and to total statewide international imports of fuel oils, lube oil, and greases. Of the annual average of 714,000 tons of seafood products exported by Alaska to international destinations over the time period 2012–2014, SW exported 675,000 tons, or 95 percent of the statewide total. The aggregated seafood products category includes Animal Feed, Fish, and Other Agricultural Products. However, it excludes products classified as Unknown or NEC. SW exports falling into this category were considerable—nearly 97,000 tons over the three-year period and likely all, or at least mostly, seafood products. It is worth noting that the Forest Products export total for SW of 382,000 tons, while appearing high, is not a measure of value but of weight and likely took the form of exports of raw harvested lumber from Kodiak Island Borough. Meanwhile, SW's imports from abroad of Fuel Oils, Lube Oils, and Greases constituted 40 percent of the state total, while the region's imports of Other Agricultural Products made up 97 percent of the statewide total.

Table 14. Average Annual International Waterborne Exports by Alaskan Region and Commodity, 2012–2014

Region	Commodity (1,000 tons)			
	Seafood Products	Forest Products	Other Products	Total Exports
ARR	27	8	1,244	1,279
SE	11	302	111	424
SW	675	382	71	1,128
WN	0	0	1,133	1,133
Total, All Regions	**714**	**692**	**2,559**	**3,965**
SW Exports as % of Total	**95**	**55**	**3**	**28**

Source: Northern Economics analysis of data from USACE (2015).

Table 15. Average Annual International Waterborne Imports by Commodity and Region, 2012–2014

Region	Commodity (1,000 tons)				
	Gasoline, Jet Fuel, Kerosene	Fuel Oils, Lube Oil & Greases	Other Agricultural Products	Other Products	Total Imports
ARR	395	18	> 0	451	864
SE	96	75	> 0	66	238
SW	30	153	21	40	244
WN	41	129	0	6	176
Total, All Regions	**546**	**371**	**21**	**561**	**1,500**
SW Imports as % of Total	**3**	**40**	**97**	**7**	**15**

Source: Northern Economics analysis of data from USACE (2015).

Table 16 disaggregates average annual international waterborne exports originating from SW by commodity group and destination country from 2012 to 2014, while Table 17 provides the equivalent breakdown for international imports. The East Asian countries of China, South Korea, and Japan are the top destinations for exports from SW, with the overwhelming majority of these exports consisting of seafood products and forest products (see Table 16).

Table 16. Average Annual International Waterborne Exports by Commodity and Destination from SW, 2012–2014

Country	Commodity (1,000 tons)			
	Seafood Products	Forest Products	Other Products	Total Exports
China	218	331	11	561
South Korea	249	22	41	313
Japan	149	1	19	168
Other Countries	59	27	0	87
Total, All Countries	**675**	**382**	**71**	**1,128**

Source: Northern Economics analysis of data from USACE (2015).

Meanwhile, nearly all international waterborne imports to SW originate from Canada, South Korea, Japan, and China, with petroleum products constituting the majority of imports (see Table 17).

Table 17. Average Annual International Waterborne Imports to SW by Commodity and Country of Origin, 2012–2014

	Commodity (1,000 tons)				
Country	Gasoline, Jet Fuel, Kerosene	Fuel Oils, Lube Oil & Greases	Other Agricultural Products	Other Products	Total Imports
Canada	7	85	0	9	101
China	8	0	0	6	14
Japan	0	42	7	9	58
South Korea	15	22	14	14	65
Other Countries	0	4	0	2	7
Total, All Countries	**30**	**153**	**21**	**40**	**244**

Source: Northern Economics analysis of data from USACE (2015).

Table 18 shows that the vast majority of exports of seafood products (both unprocessed and processed) destined for Asia originate in Dutch Harbor, while nearly all of international exports of forest products originate in Kodiak.

Table 18. Average Annual SW Waterborne Exports by Commodity and Port of Origin, 2012–2014

	Commodity (1,000 tons)			
Port	Seafood Products	Forest Products	Other Products	Total Exports
Dutch Harbor	635	2	71	707
Kodiak	10	381	0	391
Other SW Ports	30	0	0	30
Total, All SW Ports	**675**	**382**	**71**	**1,128**

Source: Northern Economics analysis of data from USACE (2015).

On the import side of the trade ledger, Table 19 demonstrates that 95 percent of international waterborne imports to SW arrived at Dutch Harbor.

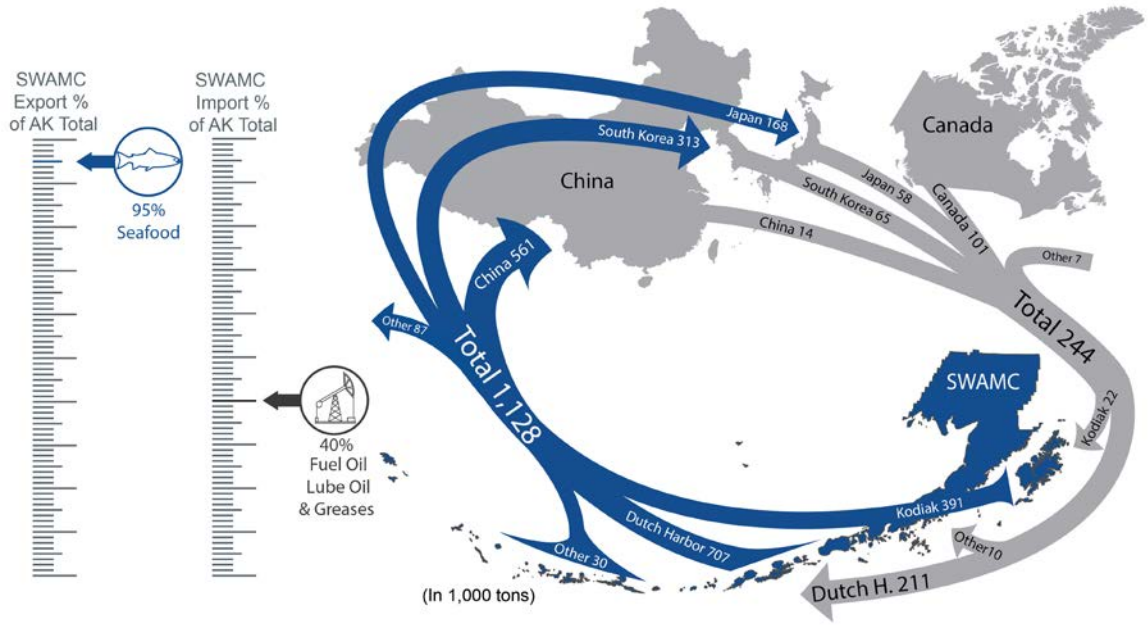
Table 19. Average Annual International Waterborne Imports to SW by Commodity and Destination Port, 2012–2014

	Commodity (1,000 tons)				
Port	Gasoline, Jet Fuel, Kerosene	Fuel Oils, Lube Oil & Greases	Other Agricultural Products	Other Products	Total Imports
Dutch Harbor	30	149	3	30	211
Kodiak	0	0	18	3	22
Other SW Ports	0	4	0	6	10
Total, All SW Ports	**14**	**148**	**21**	**39**	**222**

Source: Northern Economics analysis of data from USACE (2015).

Figure 17 summarizes the international waterborne export and import story, as it depicts the discrepancy (in tonnage) between exports from and imports to SW. The figure also shows the tonnages of commodities originating from SW ports and arriving at international destinations, as well as the equivalent import tonnages. The export and import scales on the left side of the graphic reinforce SW's prominence with respect to Alaska's total exports of unprocessed fish and imports of fuel oils.

Figure 17. Average Annual International Waterborne Imports and Exports (1,000 tons), SW, 2012–2014



Source: Developed by Northern Economics based on data from USACE (2015).

6 Strategic Importance of SW to Maritime Commerce

Measures of economic activity directly associated with SW fail to fully capture the importance of the region to international maritime commerce and Arctic development activities. Thousands of commercial vessels travel through Aleutian waters each year, with the majority of cargo ships traveling between Northwest North America and East Asia via the North Pacific Great Circle Route. Vessels following this route pass through Unimak Pass in the Eastern Aleutians, and those transiting north of the Aleutian Islands cross again at a point west of Tanaga Island.

Table 20 shows the number of vessels and tracks (trips) by vessel type transiting through Aleutian waters between August 1, 2008 and July 31, 2009, as recorded as part of the Aleutian Islands Risk Assessment's Semi-quantitative Traffic Study Report. The majority of the unique vessels were cargo vessels of some kind, while fishing vessels accounted for the most tracks. Most of the bulk carriers were transiting the North Pacific Great Circle Route, but approximately 25 bulk carriers entering the Aleutians between July and October were traffic from Red Dog Mine in Northwest Alaska headed for Europe, Asia, and British Columbia. It should be noted that the number of fishing vessels likely is understated due to the fact that the study included only vessels carrying at least 10,000 gallons of fuel oil or other oil products. In addition, total recorded vessel volume over the study time frame was low relative to preceding and ensuing years because of the global economic downturn that caused a drop of about 12 percent in world trade volume in 2009. The Traffic Study Report further predicted that the sharpest growth in vessel traffic is expected for container ships greater than 4,500 TEUs,[6] from 1,000 tracks in 2010 to 1,800 tracks by 2035 (Det Norske Veritas & ERM West, Inc. 2010).

Table 20. Number of Vessels and Tracks by Vessel Type through Aleutian Waters, August 2008 – July 2009

Vessel Type	Number of Vessels	Percentage of Vessels by Type (%)	Number of Recorded Tracks	Percentage of Recorded Tracks (%)
Bulk Carriers	911	41.1	1,899	12.0
Container ships	491	22.1	1,914	12.1
Fishing Vessels	373	16.8	9,424	59.7
General Cargo Vessels	105	4.7	249	1.6
Roll-on/Roll-off and Car Carriers	98	4.4	227	1.4
Tugs	66	3.0	994	6.3
Other Vessels	44	2.0	441	2.8
LNG, Gas, Crude Oil, & Chemical Carriers	26	1.2	85	0.5
Refrigerated Cargo Ships	40	1.8	264	1.7
Product Tankers	33	1.5	59	0.4
Government Vessels	19	0.9	186	1.2
Cruise Ships	13	0.6	46	0.3
Total, All Vessels	**2,219**	**100**	**15,788**	**100**

Source: Det Norske Veritas & ERM West, Inc. (2010).

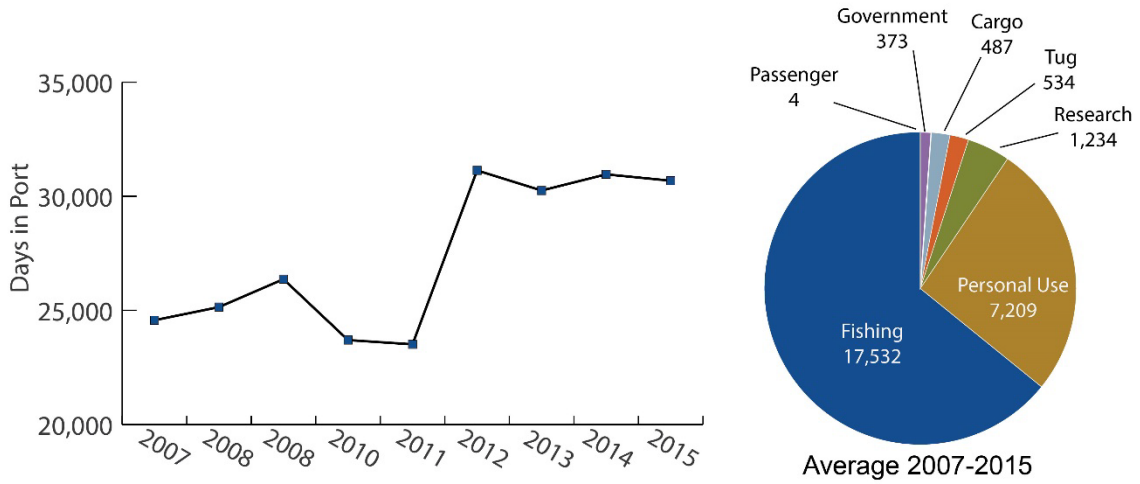
While the majority of cargo vessels transiting through Aleutian waters pass through without stopping, many cargo and other vessels call at Dutch Harbor for fuel and other services. Marine infrastructure at Unalaska includes multiple docks, uplands, warehouse and storage space, heavy industrial equipment,

[6] A TEU is a twenty-foot equivalent unit and is an inexact unit of cargo capacity.

fuel storage, crew lodging, and an airport, as well as infrastructure to load, offload, and transport containerized and bulk/oversized cargo. Available services include ship repair and marine safety services, and both the Alaska Marine Pilots and U.S. Coast Guard maintain offices and permanent staff in Unalaska (Northern Economics, Inc. 2014).

Data provided by the City of Unalaska Department of Ports and Harbors indicate that a large volume and broad range of vessels utilize the services available at Dutch Harbor (see Figure 18). Horizon Lines, Samson Tug and Barge, APL, and Lynden all provide regular cargo services in and out of Dutch Harbor (Northern Economics, Inc. 2014). While fishing vessels spend the most days in port at Dutch Harbor by a sizeable margin, the pie chart demonstrates that government, cargo, tug, and research vessels also frequently call at the port. The high number of days in port spent by personal use vessels likely reflects a relatively small number of personal use vessels that remain in port all or most of the year. The line graph also indicates a pronounced and sustained increase in total days spent in port across all vessel types from 2011 onward.

Figure 18. Total Days in Port across All Vessels and Average Annual Distribution of Days in Port by Vessel Type, Dutch Harbor, 2007–2015



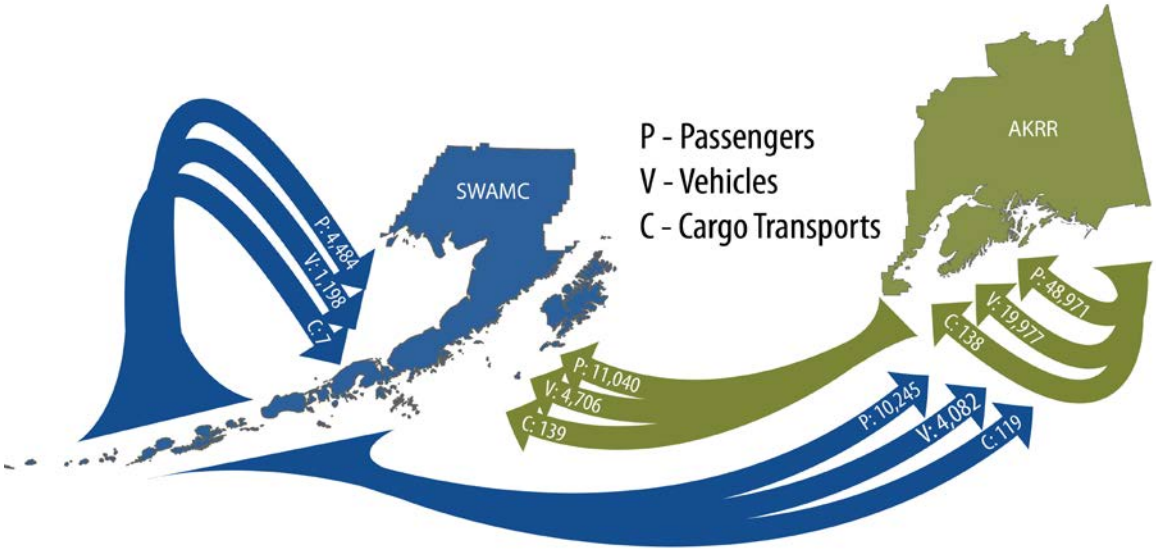
Source: Developed by Northern Economics based on data from City of Unalaska (2016).

According to the USACE, Dutch Harbor and other Aleutian ports could play important roles in supporting Arctic development activities. In its Alaska Deep-Draft Arctic Port System Study, the USACE noted that diminishing sea ice and increased natural resource expansion are occurring, with examples of increased Arctic activity including drilling in the Chukchi Sea, dredging for gold in Nome, and the passage of ore and concentrates via the Northern Sea Route. The USACE further stated that investment in and development of existing and potential Arctic ports could result in increased trans-shipment from Asia to Europe, with resupply and fueling at Dutch Harbor. Moreover, the study pointed out that both Adak and Dutch Harbor play important roles in the staging of Arctic maritime activities and will play key roles in trans-shipment activities in support of Arctic operations. According to the study, Adak offers significant uplands facilities to support equipment and personnel related to oil and gas industry operations offshore of Alaska's North Slope (USACE 2013).

7 Alaska Marine Highway System

The Alaska Marine Highway System (AMHS) is a critical means of conveyance between Southwest and ARR—as well as between points within SW—that serves as the region's equivalent of ARR's road system. With the middle sets of arrows, Figure 19 depicts the average annual volumes of people, vehicles, and cargo transported between the two regions via the AMHS over the years 2010–2012 and 2014. The figures presented in Figure 19 exclude volumes from 2013, when the MV Tustumena was largely out of commission and AMHS service to Southwest was greatly curtailed. Over the four years under analysis, the AMHS conveyed more than 11,000 passengers, 4,706 vehicles, and 139 cargo transports from ARR to SW annually, with slightly lower volumes traveling from SW to ARR. In addition, nearly 5,000 passenger trips and 1,200 vehicle trips between SW communities were made annually via the AMHS over the four-year period.

Figure 19. Average Annual Intra- and Interregional Utilization of AMHS, 2010–2012 & 2014



Source: Developed by Northern Economics based on data from ADOTPF (2015a).

Table 21, Table 22, and Table 23 detail the number of intra- and interregional passenger, vehicle, and cargo transports, respectively, for each of the five years ending in 2014. While vessel schedules can vary considerably year-to-year, utilization of the AMHS for transport both within SW and from SW to ARR was fairly steady over the years 2010–2012 and 2014, with noticeable drop-offs in all three categories in 2013.

Table 21. AMHS Passenger Flows between SW and ARR, 2010–2014

Year	From SW to ARR	From ARR to SW	Interregional Total	Within SW
2010	10,179	10,998	21,177	4,029
2011	10,391	11,284	21,675	4,700
2012	10,268	10,950	21,218	4,456
2013	5,574	6,237	11,811	1,666
2014	10,143	10,927	21,070	4,751
Average, 2010-12 & 2014	**10,245**	**11,040**	**21,285**	**4,484**

Source: Developed by Northern Economics based on data from ADOTPF (2015a).

Table 22. AMHS Vehicle Flows between SW and ARR, 2010–2014

Year	From SW to ARR	From ARR to SW	Interregional Total	Within SW
2010	3,995	4,609	8,604	1,077
2011	4,331	4,929	9,260	1,309
2012	4,016	4,600	8,616	1,144
2013	2,779	3,314	6,093	479
2014	3,985	4,687	8,672	1,261
Average, 2010-12 & 2014	**4,082**	**4,706**	**8,788**	**1,198**

Source: Developed by Northern Economics based on data from ADOTPF (2015a).

Table 23. Count of AMHS Cargo Flows between SW and ARR, 2010–2014

Year	From SW to ARR	From ARR to SW	Interregional Total	Within SW
2010	107	132	239	1
2011	121	146	267	2
2012	132	142	274	14
2013	102	115	217	3
2014	114	136	250	11
Average, 2010-12 & 2014	**119**	**139**	**258**	**7**

Source: Developed by Northern Economics based on data from ADOTPF (2015a).
Note: AMHS refers to cargo shipments as "vans," which are defined "as vehicles, normally commercial, from 12' to 13' in height with enclosed cargo space. Vans can be any length and either self-propelled or towed. A flatbed truck or trailer, with a load higher than 10 feet from the ground, is also considered a van."

Homer is the primary port of origin for AMHS vessel transits from ARR ports to SW ports and the primary destination for vessel trips from SW ports to ARR ports. Meanwhile, the overwhelming majority of passenger, vehicle, and cargo transports from ARR and destined for SW ports arrive in Kodiak. Table 24 breaks down the year-by-year volumes of passenger, vehicle, and cargo transits destined for or departing from Homer via the AMHS by SW port of origin and/or destination. More than 90 percent of passenger, vehicle, and cargo transits from Homer to SW via the AMHS over the years 2010–2014 were destined for Kodiak, and, similarly, more than 90 percent of the transits across each of these three categories to Homer from SW originated in Homer.

Table 24. AMHS Passenger, Vehicle, and Van Flows between SW Ports and Homer, 2010–2014

Year	Origin/ Destination	To Homer			From Homer		
		Passengers	Vehicles	Vans	Passengers	Vehicles	Vans
2010	Kodiak	8,965	3,437	82	9,570	3,808	84
	Port Lions	321	138		370	181	
	Dutch Harbor	171	30	1	207	26	
	Chignik	121	25		122	51	
	All Others	122	74	1	108	126	1
2011	Kodiak	8,783	3,692	99	9,461	4,042	104
	Port Lions	446	193		467	195	
	Dutch Harbor	230	35		315	47	
	Chignik	183	21		204	56	
	All Others	126	94	9	119	171	8
2012	Kodiak	9,002	3,400	102	9,469	3,740	98
	Port Lions	240	118		316	147	
	Dutch Harbor	171	44		192	37	
	Chignik	120	29		127	44	
	All Others	196	106	4	238	170	4
2013	Kodiak	4,781	2,289	73	5,342	2,613	72
	Port Lions	90	42		79	45	
	Dutch Harbor	21	14		49	15	
	Chignik						
	All Others	55	43	1	97	67	
2014	Kodiak	8,643	3,361	93	9,335	3,851	109
	Port Lions	335	160		394	193	
	Dutch Harbor	242	44	1	267	39	
	Chignik	149	27		129	34	
	All Others	206	101		256	167	
Average, 2010–2012 & 2014	Kodiak	8,848	3,473	94	9,459	3,860	99
	Port Lions	336	152		387	179	
	Dutch Harbor	204	38	1	245	37	
	Chignik	143	26		146	46	
	All Others	163	94	5	180	159	4

Source: Developed by Northern Economics based on data from ADOTPF (2015b).

Note: Repairs to the M/V Tustumena that extended into August 2013 significantly reduced AMHS sailings to Southwest communities that year.

8 Air Transport

In the absence of a road system connecting SW to the rest of the state, aviation represents an important interregional mode of transport of people, freight, and mail. Northern Economics obtained data regarding passenger, freight, and mail volumes originating from and arriving at SW airports from the "Air Carriers: T100 Domestic Markets - All Carriers" dataset, which shows only passengers, mail, and cargo that enplaned or deplaned at a given airport. The BTS data have proved a valuable resource in past economic activity analyses because they are the most powerful tool for showing movements between airports. However, only larger certificated carriers report into the system, while general aviation flights and small air taxi operators generally do not.

SW relies on air transport particularly heavily for the movement of passengers and mail. Over the five years ending in 2014, combined inbound transport of passengers, freight, and mail to SW and outbound transport of passengers, freight, and mail from SW accounted for 7.1 percent, 1.7 percent, and 12.4 percent of combined inbound volumes arriving in Alaska and outbound volumes departing Alaska, respectively (see Table 25). These figures include all inbound passengers, freight, and mail originating either from points within Alaska or airports outside the state, as well as outbound transports destined either for intrastate locations or points outside Alaska.

Table 25. SW Passenger, Freight, and Mail Transports as Portion of Total Alaskan Volumes, 2010–2014

	Passengers (1000s)	Freight (million lb)	Mail (million lb)
Total Inbound and Outbound Volumes, 2010–2014	31,067.9	9,426.9	989.8
Avg Inbound and Outbound Volumes, 2010–2014	6,213.6	1,885.4	198.0
SW Avg Annual Inbound Volumes	218.9	17.3	18.3
SW Avg Annual Outbound Volumes	219.6	14.4	6.3
SW Inbound % of Total	3.5	0.9	9.2
SW Outbound % of Total	3.5	0.8	3.2
SW % of All AK Inbound and Outbound	7.1	1.7	12.4

Source: Developed by Northern Economics based on data from BTS (2015).

Table 26 shows the average annual intraregional and interregional volumes of passengers and weight of freight and mail arriving at and originating from SW airports via domestic air transport over the years 2010–2014. During this time period, more than 70 percent of passenger arrivals to SW originated in ARR, compared to 25 percent originating from within SW, 4 percent from outside Alaska, and less than 1 percent each from WN and SE. The respective proportions of passengers traveling by air from SW to the other four regions were nearly identical. Importantly, commercial travel between SW communities is very limited, and the majority of intraregional air travel requires a connection through Anchorage. In many cases, passengers flying from SW to Anchorage may only be stopping over in Anchorage for a brief period of time and then boarding a flight for another SW destination.

Meanwhile, 87 percent of inbound air freight to SW originated from ARR, compared to 12 percent from within the region and minimal amounts from WN, SE, and outside Alaska. For outbound air freight from SW, ARR again was the primary destination (83 percent), followed by intraregional transports (15 percent). This trend of ARR being the preponderant region of origin and destination holds for inbound air transport of mail but is reversed for outbound mail from SW. On average, only 1.3 million pounds of mail was sent via air from SW to ARR over the years 2010–2014, slightly more than the 1.2 million

pounds of mail destined for points outside Alaska and far less than the 3.8 million pounds remaining within the region.

Table 26. Average Inbound and Outbound Volumes of Passengers, Freight, and Mail, SW, 2010–2014

Destination Region	Inbound			Outbound		
	Passengers	Freight (million lb)	Mail (million lb)	Passengers	Freight (million lb)	Mail (million lb)
ARR	155,557	15.0	14.4	156,156	11.9	1.3
SW	53,908	2.1	3.8	53,908	2.1	3.8
WN	828	>0	>0	692	>0	>0
SE	1	>0	>0	65	>0	>0
Outside AK	8,630	0.2	>0	8,774	0.4	1.2
Total	**218,924**	**17.3**	**18.3**	**219,594**	**14.4**	**6.3**

Source: Developed by Northern Economics based on data from BTS (2015).

8.1 Passenger Travel

Passenger air travel data reveal the importance of Anchorage as the main point of connection between SW communities and the rest of the state and areas beyond, with 71 percent of outbound (from SW) passengers destined for Anchorage and 71 percent of inbound passengers originating in Anchorage. As noted above, many passengers flying from SW to Anchorage or from Anchorage to SW may be using Anchorage as a connecting point to another SW community, as intraregional service is limited. Nevertheless, Anchorage was the destination city for the top six outgoing (from SW) origin-destination city pairs from 2010–2014, as determined by passenger volumes, and the city of origin for the top six incoming origin-destination city pairs (see Table 27). In addition, Kodiak, Unalaska, King Salmon, and Dillingham comprised the top four passenger origin (outbound) and destination (inbound) cities, with Cold Bay, Iliamna, King Salmon, Old Harbor, and King Cove rounding out the top ten in each list.

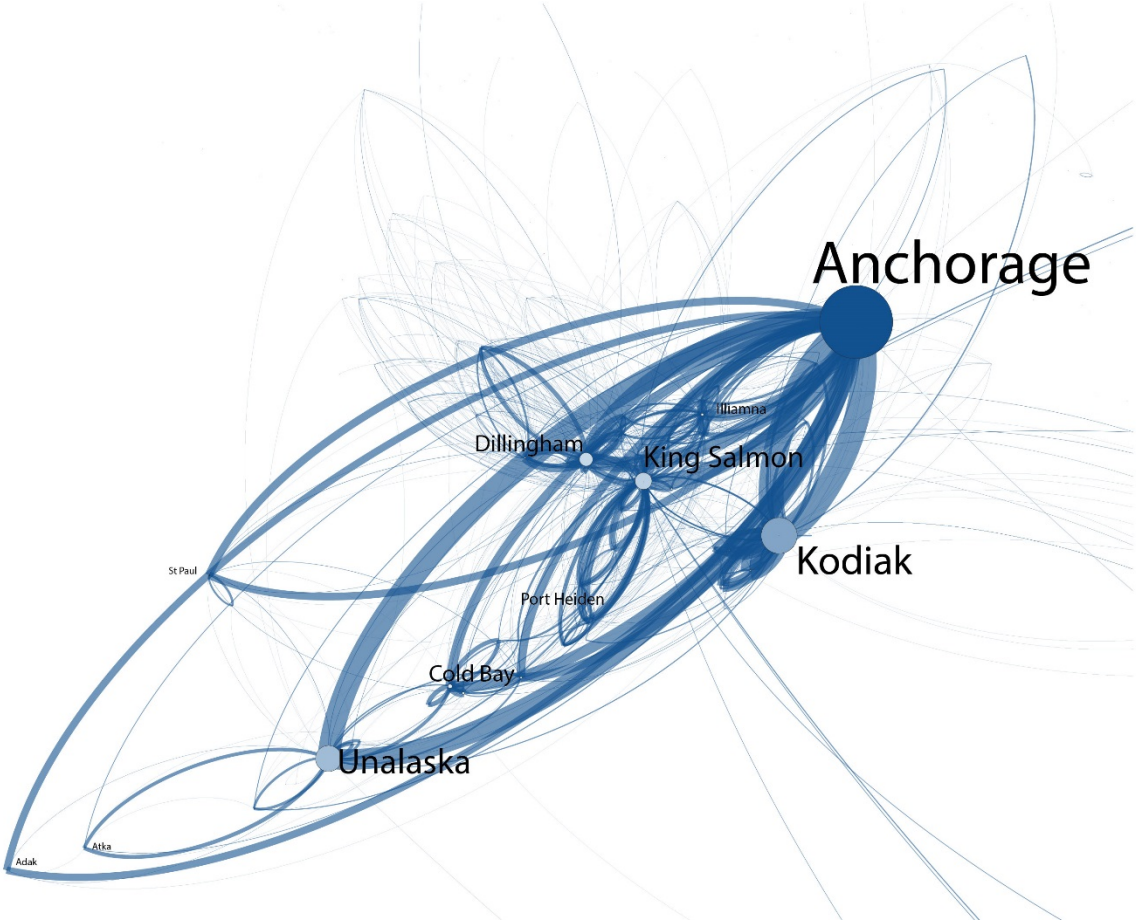
Table 27. Total Passenger Trips to and from SW by Top Origin-Destination Pairs, 2010–2014

From SW			To SW		
Origin	Destination	Passengers	Origin	Destination	Passengers
Kodiak	Anchorage	336,569	Anchorage	Kodiak	334,549
Unalaska	Anchorage	135,115	Anchorage	Unalaska	130,061
King Salmon	Anchorage	126,710	Anchorage	King Salmon	127,599
Dillingham	Anchorage	114,756	Anchorage	Dillingham	115,879
Cold Bay	Anchorage	24,928	Anchorage	Cold Bay	27,044
Iliamna	Anchorage	19,572	Anchorage	Iliamna	19,043
King Salmon	Brooks Lodge	18,663	Brooks Lodge	King Salmon	16,548
Kodiak	Old Harbor	15,145	Kodiak	Old Harbor	15,145
Old Harbor	Kodiak	14,610	Old Harbor	Kodiak	14,610
King Cove	Cold Bay	12,733	King Cove	Cold Bay	12,733

Source: Developed by Northern Economics based on data from BTS (2015).

Figure 20 illustrates total inbound and outbound volumes of passenger flights between SW cities and other destinations (including other SW cities) between the years 2010–2014. Relative volumes of inbound and outbound passengers traveling between origin-destination pairs are denoted by the thickness of the lines connecting the cities, while the relative volume of total inbound and outbound passenger trips for each city in the graphic is denoted by the area of its circle.

Figure 20. Volumes of Passenger Trips to and from SW by Air, 2010–2014



Source: Developed by Northern Economics based on data from BTS (2015).

8.2 Freight

The vast majority of freight destined for SW by air (86 percent) from 2010–2014 originated in Anchorage, with only a slightly lower proportion of air freight originating in SW (83 percent) destined for Anchorage (see Table 28). More than four times as much outbound air freight originated in Kodiak as any other SW city, with King Salmon, Unalaska, Dillingham, and Cold Bay rounding out the top five SW origin cities in terms of freight tonnage. Meanwhile, King Salmon, Dillingham, Kodiak, Iliamna, and Unalaska comprised the top five SW destinations in terms of air freight tonnage over the five years ending 2014, with Anchorage the city of origin in each case.

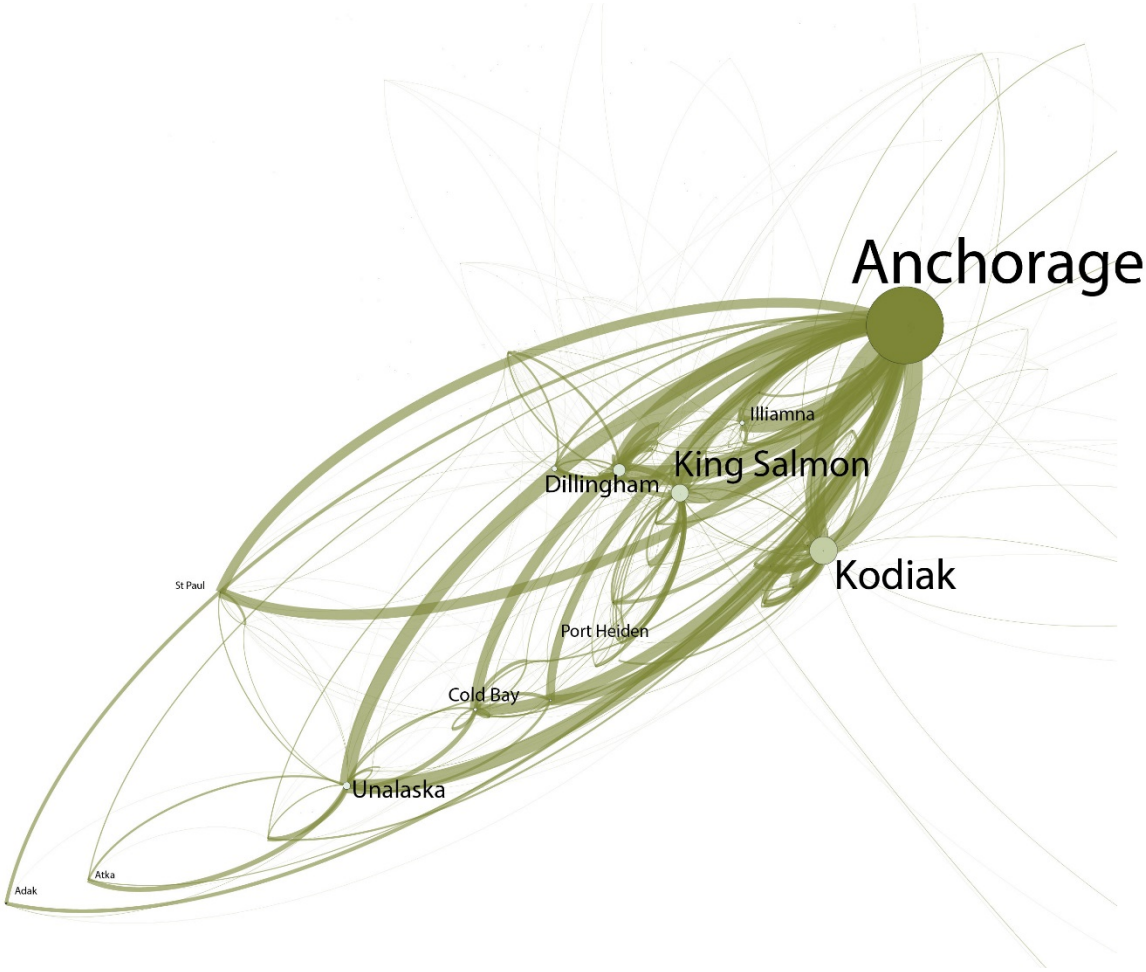
Table 28. Total Freight Transport to and from SW by Top Origin-Destination Pairs (Million lb), 2010–2014

From SW			To SW		
Origin	Destination	Freight	Origin	Destination	Freight
Kodiak	Anchorage	31.6	Anchorage	King Salmon	21.5
King Salmon	Anchorage	8.1	Anchorage	Dillingham	17.1
Unalaska	Anchorage	7.2	Anchorage	Kodiak	14.5
Dillingham	Anchorage	4.6	Anchorage	Iliamna	6.6
Cold Bay	Anchorage	3.8	Anchorage	Unalaska	5.8
Kodiak	Old Harbor	2.0	Anchorage	Port Alsworth	2.3
Iliamna	Anchorage	2.0	Kodiak	Old Harbor	2.0
Adak	Anchorage	1.4	Anchorage	Adak	1.6
Kodiak	Ouzinkie	0.9	Anchorage	Cold Bay	1.5
Kodiak	Larsen Bay	0.9	Anchorage	Port Heiden	0.9

Source: Developed by Northern Economics based on data from BTS (2015).

Figure 21 illustrates total inbound and outbound volumes of air freight transported between SW cities and other destinations (including other SW cities) between 2010–2014. Relative volumes of inbound and outbound freight transported between origin-destination pairs are denoted by the thickness of the lines connecting the cities, while the relative volume of total inbound and outbound freight tonnage for each city in the graphic is denoted by the area of its circle.

Figure 21. Volumes of Freight Transport to and from SW by Air, 2010–2014



Source: Developed by Northern Economics based on data from BTS (2015).

8.3 Mail

Anchorage was the top city of origin for inbound mail to SW over the years 2010–2014, with 79 percent of inbound mail (by weight) originating in Anchorage. By a sizeable margin, Dillingham was the top inbound destination, with King Salmon, Kodiak, Unalaska, and Iliamna rounding out the top five SW destinations for inbound mail (see Table 29). Meanwhile, Dillingham was the top city of origin for outbound air mail, with Dillingham the city of origin for the top three (and five of the top ten) origin-destination pairs. Notably, unlike with passenger and freight transport, Anchorage was not the top destination for outbound air mail. Instead, the list of top outbound air mail origin-destination pairs (by weight) is highlighted by significant variety in the destination cities.

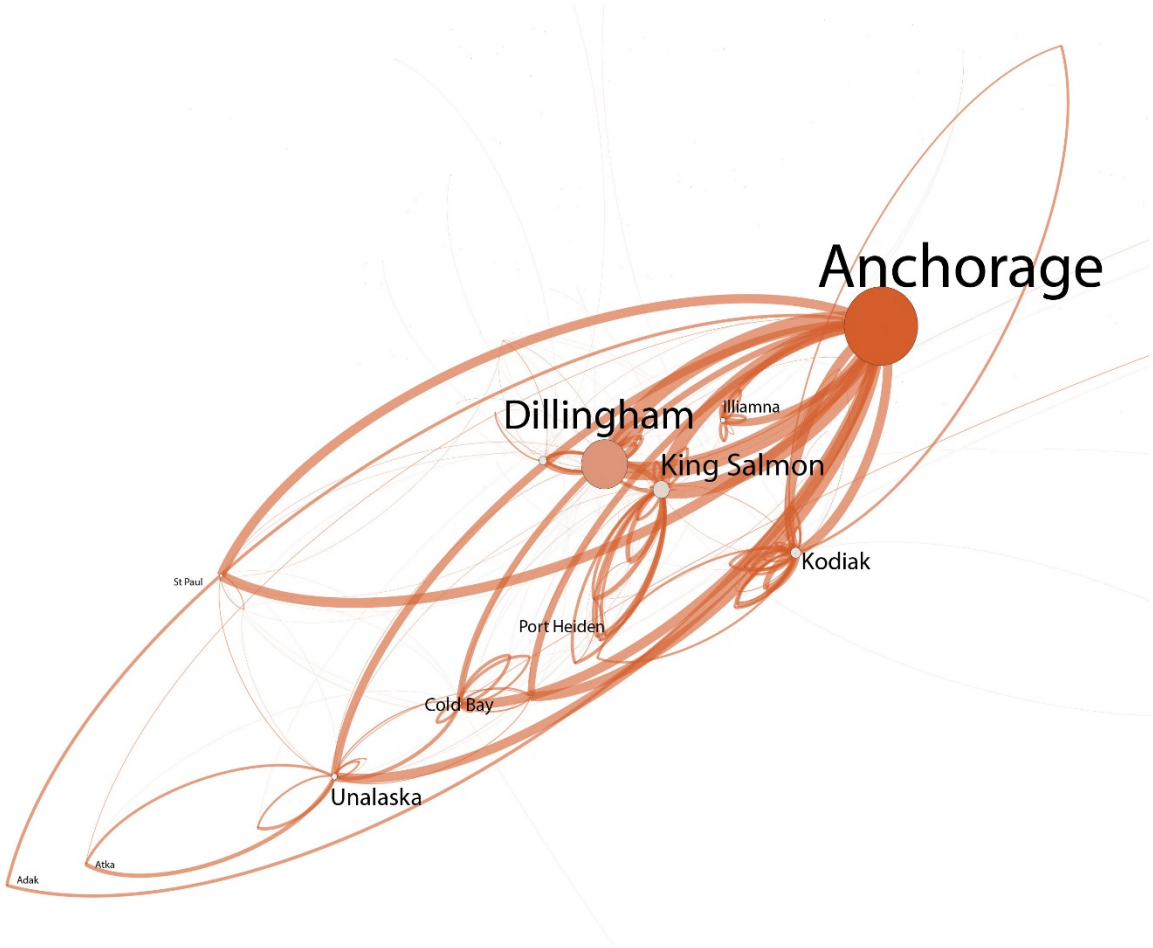
Table 29. Total Mail Transported via Air to and from SW by Top Origin-Destination Pairs (Million lb), 2010–2014

From SW			To SW		
Origin	Destination	Mail	Origin	Destination	Mail
Dillingham	Togiak	5.3	Anchorage	Dillingham	40.6
Dillingham	New Stuyahok	2.7	Anchorage	King Salmon	12.9
Dillingham	Manokotak	2.5	Anchorage	Kodiak	7.7
Kodiak	Anchorage	2.4	Anchorage	Unalaska	4.1
King Salmon	Port Heiden	1.3	Anchorage	Iliamna	3.7
Unalaska	Anchorage	1.2	Anchorage	New Stuyahok	2.7
Dillingham	Anchorage	1.1	Cold Bay	Manokotak	2.5
Cold Bay	King Cove	1.1	Dillingham	Cold Bay	2.3
Dillingham	Koliganek	1.0	Dillingham	Port Heiden	1.3
King Salmon	Anchorage	1.0	King Salmon	King Cove	1.1

Source: Developed by Northern Economics based on data from BTS (2015).

Figure 22 illustrates total inbound and outbound volumes of air mail transported between SW cities and other destinations (including other SW cities) between 2010–2014. Relative volumes of inbound and outbound mail transported between origin-destination pairs are denoted by the thickness of the lines connecting the cities, while the relative volume of total inbound and outbound mail tonnage for each city in the graphic is denoted by the area of its circle.

Figure 22. Volumes of Mail Transport to and from SW by Air, 2010–2014



Source: Developed by Northern Economics based on data from BTS (2015).

9 Tourism

The Alaska Visitors Statistics Program (AVSP) provides the most complete profile of Alaska's visitor industry. Authored by McDowell Group for the Alaska Department of Commerce, Community, and Economic Development, the AVSP report is published every five years and provides statewide and regional statistics regarding employment and labor income, taxes and revenues, overall economic impact, and visitor volumes (for non-Alaska residents who travel to Alaska). This section highlights AVSP findings specific to SW, as well as more recent updates from the less comprehensive Interim Visitor Volume Report. First, though, it is important to point out that the AVSP's definition of Southwest Alaska includes the Bethel Census Area and that it considers Kodiak separately from the rest of the SW region. This analysis did not attempt to reconcile the reported survey results with this study's definition of SW. As such, study findings are presented separately for SW (including Bethel Census Area) and Kodiak.

The summer survey portion of the 2011 AVSP revealed that approximately 58,000 out-of-state visitors traveled to SW from May 1 to September 30 that year, in addition to 34,000 visitors to Kodiak. A separate winter survey tracked visitor volumes from October 1, 2011 to April 30, 2012. The typical experience of visitors to SW had several distinguishing characteristics:

- The average length of stay in Alaska among those whose Alaska travels included a stay in SW was 13.3 nights, compared to 9.2 nights among the entire visitor sample.
- More than half of visitors to SW indicated they would return to Alaska, compared to 38 percent among all visitors. In addition, three out of five visitors to SW had previously visited Alaska.
- Visitors to SW reported higher total spending in Alaska ($1,514 per person, $1,110 among Kodiak visitors) compared to $941 among all visitors. The average spending among visitors while actually visiting the region was $476 in SW and $386 in Kodiak.
- Visitors to SW utilized air travel at a far higher rate for travel to and from the state (67 percent among SW visitors, 56 percent among Kodiak visitors) than all visitors (39 percent), as well as for travel between Alaskan communities (48 percent for SW visitors, 40 percent for Kodiak visitors, 10 percent for all visitors).
- SW and Kodiak visitors (82 percent and 83 percent) were more likely than all visitors (78 percent) to be very likely to recommend Alaska as a vacation destination.
- SW and Kodiak visitors (58 percent and 56 percent) were far more likely to return to Alaska within the next five years than all visitors (38 percent) (DCCED 2012).

In addition, the *Economic Impact of Alaska's Visitor Industry, 2013-14 Update* estimated the following:

- Four percent of full- and part-time jobs in Alaska's visitor industry from October 2013 to September 2014 (1,500 of 38,700) were held in Southwest.
- Five percent of total visitor spending ($92 million of $1.83 billion) occurred in SW from October 2013-September 2014 (DCCED 2015).

10 Summary of Key Findings

Seafood harvesting and processing operations in SW Alaska are an economic engine for the region, a major source of employment and economic output for the state, and a primary economic link with ARR. More broadly, as a region largely defined by its marine resources, SW relies heavily on water-based commerce, employment, and travel. The following represent highlights of SW's marine-based economic activity, as well as its dependence on and contributions to air travel and transport and Alaska's visitor industry.

Seafood Landings. SW boasted seven of the top ten ports in the U.S. by value of commercial seafood landings in 2014, as well as six of the top ten ports by weight of landings.

Seafood Wholesale Values. This study estimates that the wholesale value of commercial seafood harvests from SW waters—upwards of $3.2 billion per year from 2010-2014—is more than three times the ex-vessel value of shore-based landings.

Ex-Vessel Revenue by Place of Residence. Of the total ex-vessel value of shore-based seafood landings by SW fisheries from 2010-2014, an estimated 63 percent of revenues were earned by non-Alaska resident permit holders, with 24 percent going to SW residents and 11 percent earned by ARR residents.

Seafood Processing Jobs. From 2010-2014, shore-based seafood processing operations in SW provided an average of more than 6,750 jobs and $261 million in labor income per year. Non-Alaska residents held 74 percent of these jobs and took home just under 60 percent of the income, while residents of SW and residents of other regions of Alaska held 15 percent and 11 percent of the jobs and took home 25 percent and 16 percent of wages, respectively.

Economic Output of Seafood Processing Operations. According to IMPLAN estimates, the seafood product preparation and packaging sector ranked third statewide in 2014 in terms of total economic output, at $3.46 billion, with SW operations constituting 68 percent of the total.

Inter-regional Trade Flows. The value of goods and services traded between SW and the other three regions of Alaska in 2014 was modest compared to the estimated $2.6 billion in trade from SW to the rest of the U.S., more than three-quarters of which were seafood shipments. Overall, SW experienced a net trade surplus but a deficit in its trade with ARR, with the value of imports exceeding exports by a factor greater than three.

Waterborne Commerce. Waterborne commerce, both domestic and international, is critical to the SW economy. More than one million tons of cargo is exported from SW ports—primarily Dutch Harbor and Kodiak—to East Asian destinations alone each year. Moreover, the region's waterborne exports of seafood account for 95 percent of the state total. Meanwhile, SW's annual domestic waterborne shipments total nearly 1.5 million tons, with the region responsible for 53 percent of total domestic waterborne shipments of unprocessed fish by Alaska as a whole.

Alaska Marine Highway System. More than 10,000 people and 4,000 vehicles were transported from SW to ARR via the AMHS over the four years 2010–2012 and 2014, with higher volumes of passengers and vehicles being transported from ARR to SW.

Air Travel and Transport. Each year, air travel is responsible for the conveyance of hundreds of thousands of passengers and many millions of pounds of freight and mail to and from SW communities. Anchorage is the primary hub for the transport of passengers, freight, and mail between SW and ARR.

Visitor Industry. Out-of-state visitors to Alaska who travel to SW spend more money and time in the state and are more likely to return than those who do not.

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