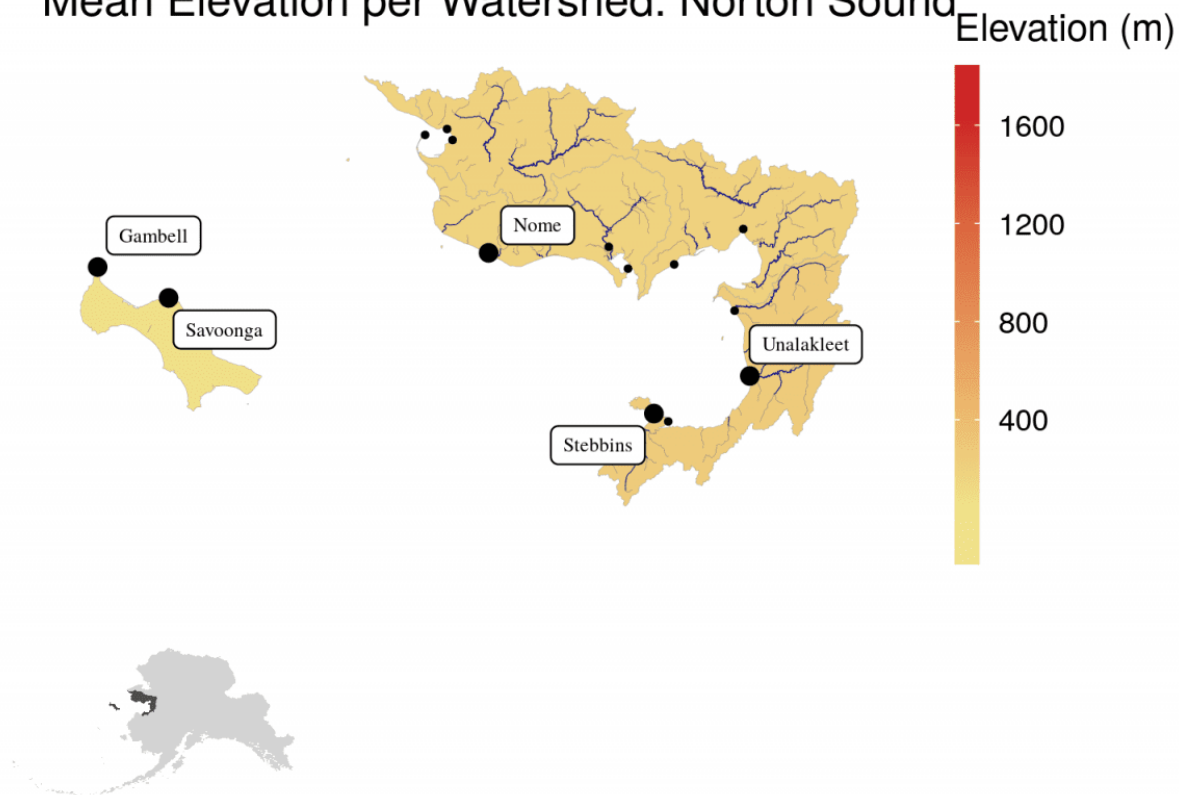


# NORTON SOUND

## Geography

This sub-Arctic region, approximately twice the size of Massachusetts, is home to 8808 people as of 2015. Since 2001, an average of 1.8 million pink salmon and 230,000 chum salmon have returned to this region and are vital for many residents.

### Mean Elevation per Watershed: Norton Sound



Jared Kibele, Rachel Carlson, and Marie Johnson. 2018. Elevation per SASAP region and Hydrologic Unit (HUC8) boundary for Alaskan watersheds. Knowledge Network for Biocomplexity. [doi:10.5063/F1D798QQ](https://doi.org/10.5063/F1D798QQ).

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## Early People and Salmon Systems

Indigenous salmon people in the Norton Sound region are represented by three distinct groups: the Iñupiat on the Seward Peninsula, King Island, and Little Diomedede Island; Central Yup'ik on the south coast of Norton Sound; and Siberian Yup'ik on St. Lawrence Island (communities of Savoonga and Gambell). Archaeological evidence in the Bering Strait region suggests that ancestors of these groups, believed to be made up of overland migrants from the Chukotka region of Russia, first settled 10,000 years ago (State of Alaska DCRA).

Trade has long been and continues to be a hallmark of life in the Norton Sound region. Seasonal, communal trade fairs and trading relationships between individuals provided a conduit through which resources and products (e.g., food, clothing, tools) moved between Chukchi peoples in far eastern Russia across the Bering Strait to coastal Yup'ik and Iñupiaq, and upriver Iñupiaq and Koyukon Athabascan communities (Magdanz et al. 2007). Unalakleet, on the southern coast of Norton Sound, was the site of a Russian-American Company trading post in the 1830s. The establishment of this post reflected the site's long history as the terminus of the Kaltag Portage and a trade route between upriver villages on the Yukon and coastal Iñupiat and Yup'ik (State of Alaska Division of Community and Regional Affairs Unalakleet community profile).

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## Changes in Systems

Churches of various denominations were established in the late 1800s in Norton Sound, first in Unalakleet and Wales, to spread Christianity throughout the northern Yup'ik and Iñupiaq regions (Burch 1994:81). After an initial attempt at conversion, a wave of missionaries abandoned their posts to seek wealth in the 1898 Nome gold rush. Missionary work resumed after the rush subsided in the 1910's and spread from Kotzebue to the Mackenzie River delta over a period of about ten years. The Euro-American settlers that came to the region to mine for gold, trap for furs, or spread gospel, participated in trade and subsistence practices but also introduced manufactured goods and store-bought foods to the Indigenous people living there.

As with early subsistence practices, trade is an important part of contemporary subsistence hunting and fishing in Norton Sound. Customary trade has been allowed by ADF&G permit in the Norton Sound-Port Clarence area since 2007, with a cap of \$500 in sales for subsistence-caught finfish. Items commonly bartered or traded under this regulation include dried and/smoked salmon strips, and to a lesser extent whole frozen fish (Magdanz et al 2007). Generally, very few people obtain and report customary trade details on permits (Menard et al 2017). Customary trade and barter of salmon is further complicated by State of Alaska food processing and safety regulations which consider anything but whole fish to be processed, and any

processing of fish requires permits from the Department of Environmental Conservation (Jenkins 2015).



*Photo: Salmon in Brevig Mission. By Brenden Raymond-Yakoubian*

## Regional Snapshot Today

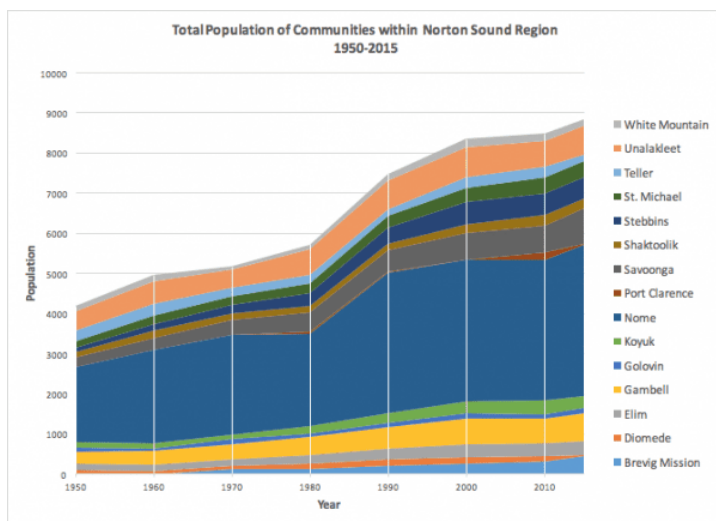
### Salmon and Habitat

Chinook salmon, though never common in this region compared to the more abundant pink salmon and chum salmon, have declined here like in other regions in Alaska. Increases, particularly chum salmon in recent years, may in part offset the loss of Chinook salmon for salmon-dependent people. The region is categorized by relatively (ranked 5th across state) cool (8.8°C) summers during which time juvenile salmon obtain most of their growth. Although among the smaller regions, nearly 5,000 km of Norton Sound streams and rivers are known to contain at least one species of

salmon. Approximately 3,000 km of river are documented to contain Chinook salmon, chum salmon, coho salmon, and pink salmon, while only 697 km of freshwaters are known to produce sockeye salmon. The lack of large lakes in the region will likely limit increased abundances of sockeye salmon even if climate conditions shifted to be more favorable for that species. The overall human footprint in this small region is evident, ranking 3rd across the state. Of 104 known culverts, 92 or 90% are potentially impacting fish passage. The history of mining in the region is evident today with footprints of 70 mines evident from aerial imagery representing 46 km<sup>2</sup> of impacted area. This level of mining activity is second only to the Yukon (391 mines).

## Salmon and People

Today, communities on the coast of Norton Sound vary considerably in their dependence on salmon. All communities harvest salmon for subsistence purposes, and several areas of Norton Sound support commercial fisheries (Menard et al. 2017). Unalakleet and Shaktoolik subdistricts take the largest catches of commercially caught salmon in the region (ibid). Regionwide, a majority of subsistence salmon are pink, chum, and coho although there are sizeable sockeye salmon runs in the Port Clarence (including the communities of Teller and Brevig Mission) and Unalakleet areas. Shaktoolik and Unalakleet have the highest levels of consistent, yearly subsistence harvest of salmon (half or more households); in other communities, a majority of household's harvest salmon in some years, and very few households do not harvest salmon at all (Magdanz et al. 2005).



Total population of Norton Sound communities, 1950 – 2015. United States Census Bureau, Juliet Bachtel, John Randazzo, and Erika Gavenus. 2018. *Alaskan Population Demographic Information from Decennial and American Community Survey Census Data, 1940-2016*. Knowledge Network for Biocomplexity. [doi:10.5063/F1XW4H3V](https://doi.org/10.5063/F1XW4H3V).



*White Mountain. Photo courtesy Julie Raymond-Yakoubian2016.*

Populations of salmon in some communities have increased and have decreased in others; Diomed, for example, which has not previously had runs of abundant salmon, has experienced an increase in the number of salmon returning to local streams (Raymond-Yakoubian and Raymond-Yakoubian 2015). Subsistence harvests of salmon, though stable, have declined over recent decades for several reasons, including declining salmon runs in some places, stricter regulations on subsistence fishing, and changing interest/ability in subsistence practices (e.g., youth are not as involved as they were in past generations, jobs that make it difficult to take time off to fish, necessity of cash income to support subsistence activities).

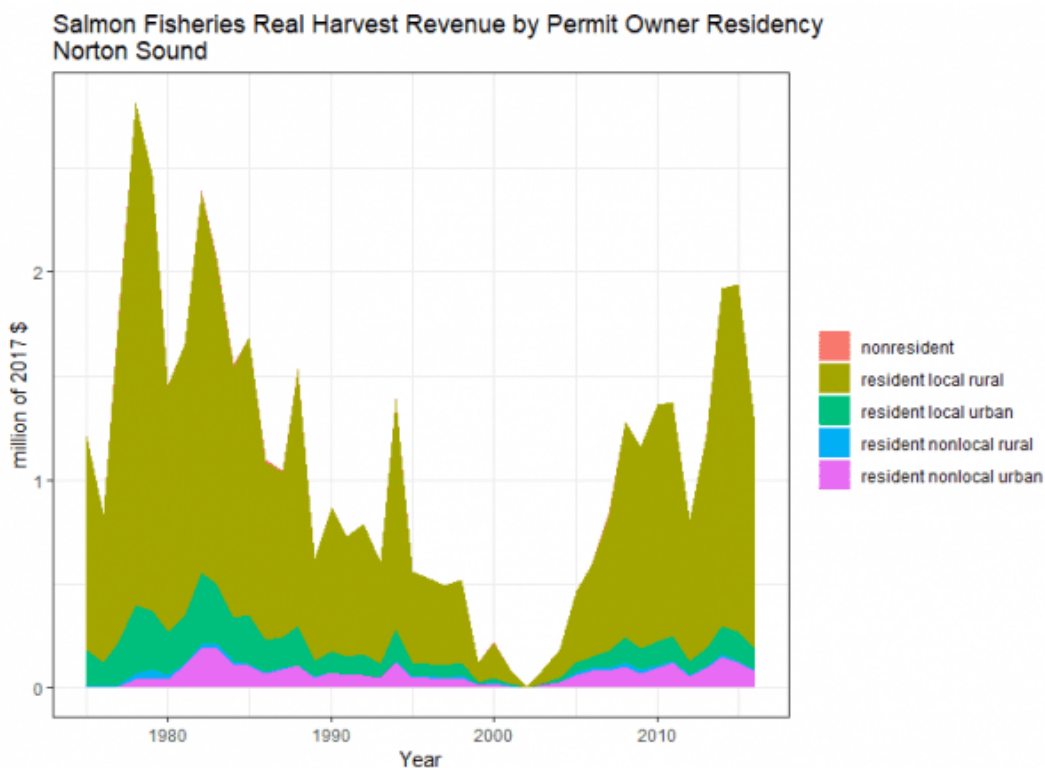
Management of the wild resources harvested by Norton Sound residents for commercial and subsistence purposes has, as in other parts of Alaska, been contentious. In a study documenting subsistence traditional knowledge (TK), Norton Sound subsistence fishermen expressed their belief that fishery management and research institutions do not place sufficient importance on TK specifically, or the concerns of Indigenous communities generally in decision-making processes, and that there “is a strong sense of injustice, of enforcement born of convenience at best, and of colonialism, racism, and the privilege of wealth being applied at worst” (Raymond-Yakoubian and Raymond-Yakoubian 2015:183).

## Fishing around Nome, photos: Melanie Banke



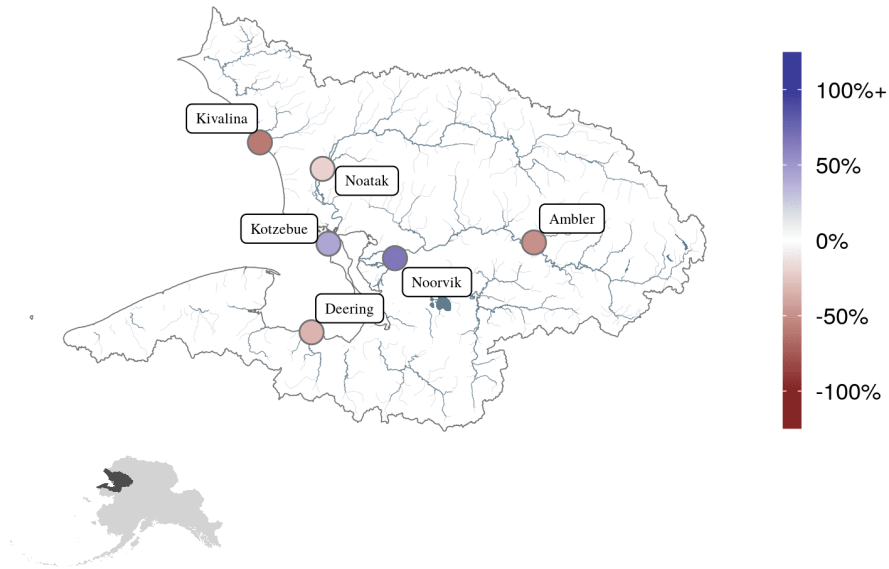
# Salmon and Economy

Salmon fisheries of Norton Sound have historically generated more than \$45 million in revenue since 1975 (2017 inflation-adjusted dollars). Despite being the smallest region in terms of historical revenue since 1975 Norton Sound has had the lowest, most stable year-by-year revenue variability of the Western Alaska salmon regions. Historically, the largest revenue share went to local rural residents of the region, followed by local urban residents (residing in Nome) and nonlocal urban residents. This pattern of revenue shares is similar to the patterns observed in the Kuskokwim and Yukon regions, indicating that commercial salmon fisheries in these regions provide important cash income for local rural subsistence cash-economies. The cash earned in commercial fishing supports cultural activities including subsistence fishing and hunting. Interesting to note, the harvest revenues in the post-2000 period show a recovery not seen in any other western Alaska salmon regions. The record inflation-adjusted harvest revenues retained in the post-2000 era is similar in size to the record harvest revenues received in the pre-2000 period.



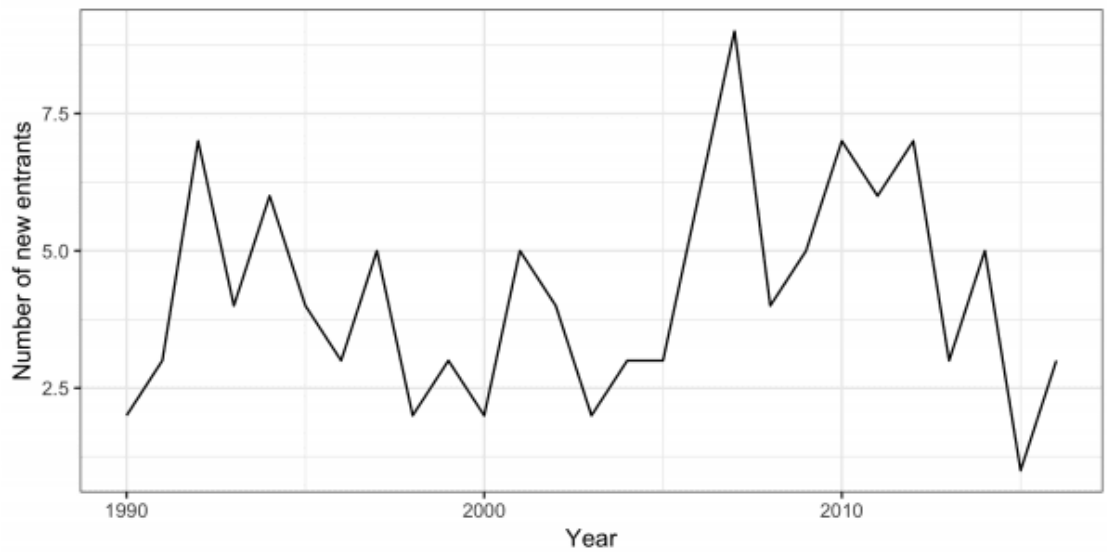
*Percent change from number of initially issued (ranging from 1975-1982) permanent commercial salmon permits held by Alaska residents to number of permits in 2016 by community. Alaska Department of Fish and Game, Commercial Fisheries Entry Commission. 2017. Commercial Fisheries Entry Commission (CFEC) Public Permit Holders by Community of Residence 1975-2016. Knowledge Network for Biocomplexity. [doi:10.5063/F1H70D1X](https://doi.org/10.5063/F1H70D1X)*

## Percent Change from Number of Initially Issued Commercial Permits to Number of Permits in 2016



Salmon fisheries real harvest revenue in Norton Sound, by permit owner residency, 1975 - 2010. Tobias Schwoerer. Regional commercial salmon permit earnings by residency status, Alaska, 1975-2016. Knowledge Network for Biocomplexity. [doi:10.5063/F1WW7FZ2](https://doi.org/10.5063/F1WW7FZ2)

## New entrants to salmon commercial fisheries Norton Sound



New entrants to salmon commercial fisheries in Norton Sound, 1980 - 2016. Commercial Fisheries Entry Commission CFEC and Tobias Schwoerer. 2016. Commercial Fisheries Entry Commission Public Permit Database from 1975-2016. Knowledge Network for Biocomplexity. [doi:10.5063/F1CV4G17](https://doi.org/10.5063/F1CV4G17).

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# Salmon and Subsistence

## State Regulatory Framework

Under state regulations, subsistence fishing permits are required in the Port Clarence District and subdistricts 1, 2, and 3 of the Norton Sound district. In the remainder of the management area, ADF&G conducts post season harvest surveys to monitor harvests. Legal gear includes gillnets, beach seines, fish wheels, and, in certain areas, a hook and line attached to a rod or pole. If fishing with the latter, a permit is required in those portions of the area not otherwise requiring one. Annual harvest limits are in place for designated waters within the areas. See 5 AAC 01.180 for details.

The ANS finding for the Norton Sound – Port Clarence Management Area is 96,000 – 160,000 salmon, including 3,430-5,716 chum salmon in Subdistrict 1 of the Norton Sound District (5 AAC 01.186(b)).

Fishery managers became concerned about salmon escapements, especially for chum salmon, in rivers around the regional center of Nome in the early 1980s. An ethnographic study documented the traditional Inupiat system for harvesting and managing salmon in the Nome area (Magdanz and Olanna 1984). However, from 1991 to 2005, subsistence fishing in the Nome area was managed primarily by ADF&G emergency order. From 1999 through 2005, chum salmon fishing in Subdistrict 1 was managed as a Tier II fishery, the only such fishery in Alaska. A “Tier II” fishery is necessary when the number of participants in a subsistence fishery must be limited because the harvestable surplus is below the lower bound of the ANS. Individual applicants are scored based on two criteria established in statute (AS 16.05.258(b)(4)(B)): their history uses of the particular fish stock and their ability to obtain alternative foods; those with the highest scores receive permits. When chum returns improved beginning in 2006, this fishery was managed as “Tier I”, in which any Alaska resident may obtain a permit but other uses (commercial, sport) are prohibited. Also, in subdistricts 5 and 6 (Shaktoolik and Unalakleet, respectively), continuing poor Chinook salmon runs have led to restrictions on subsistence fishing, including limited fishing time (Fall et al. 2018:27-28).

Beginning in 2007, the Norton Sound-Port Clarence Area became one of the few in the state where under state regulations subsistence harvests of fish could be distributed through customary trade, defined as the limited noncommercial exchange of fish or game for minimal amounts of cash (AS 16.05.940(7)). The regulations allow the sale of up to \$500 of subsistence-caught fish per year after obtaining a customary trade record keeping form from ADF&G (5 AAC 01.188). For a discussion of customary trade and barter of fish in the Norton Sound Area, see Magdanz et al. (2007).

## Federal Regulatory Framework



Federal regulations are similar to state regulations, except, unless specified by special action, there are no permit requirements or annual limits. Federal regulations also allowed the customary trade of subsistence-taken fish. Federal regulations apply on inland, navigable waters within or adjacent to the Unalakleet Wild River, the Yukon Delta National Wildlife Refuge, and the Bering Land Bridge National Preserve. General domain lands managed by the Bureau of Land Management are open to fishing by federal regulations only on non-navigable waters.

## Subsistence Salmon Harvest Patterns

Estimated subsistence salmon harvests in this management area averaged 94,697 fish per year during the period 1994-2016, with a range from 145,079 in 1996 to 52,891 in 2011 (Figure 10-1). During this period, pink salmon made up 48% of the harvest, followed by chum (23%), coho (18%), sockeye (6%), and Chinook (5%) (Figure 10-2). For a discussion of earlier harvest trends in this management area, see Magdanz (1992). A more recent study investigated harvest patterns and trends based upon household survey data collected from 1994-2003 in ten management area communities. Among other things, the study found specialization in subsistence harvests, with 21% of households harvesting about 70% of the salmon. The age of household heads and household social structure were associated with harvest levels (Magdanz et al. 2009).

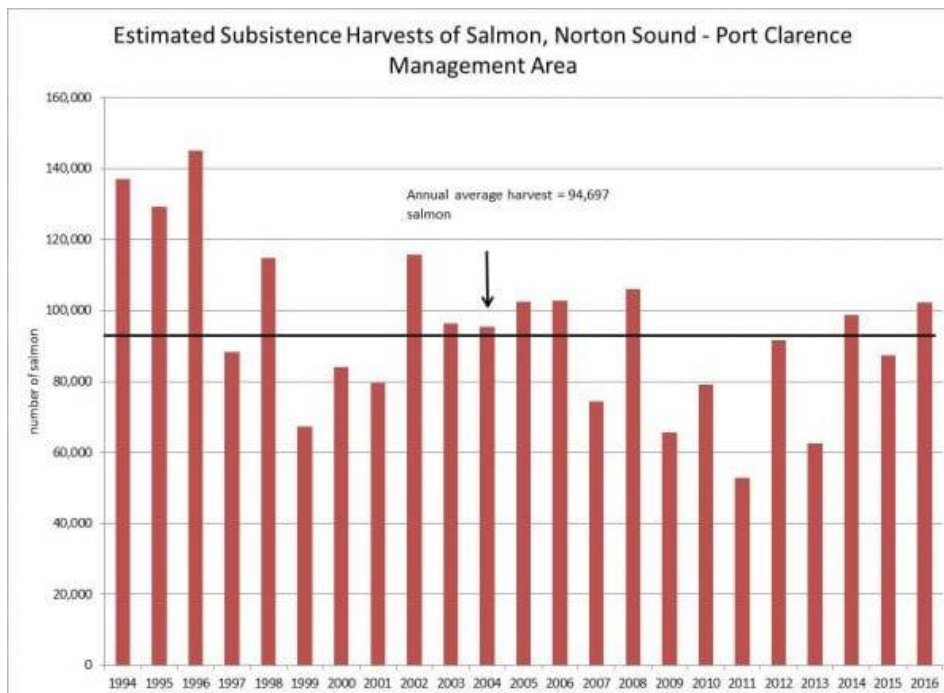


Fig. 10-1. Alaska Department of Fish and Game, Division of Subsistence. Subsistence and personal use harvest of salmon in Alaska, 1960-2012. Knowledge Network for Biocomplexity. [doi:10.5063/F18P5XTN](https://doi.org/10.5063/F18P5XTN)

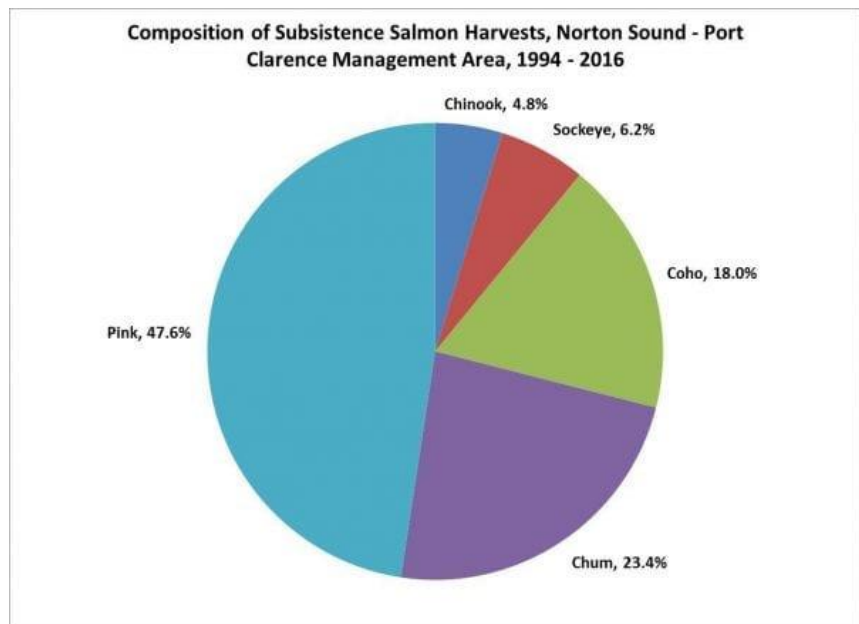


Fig. 10-2. Alaska Department of Fish and Game, Division of Subsistence. Subsistence and personal use harvest of salmon in Alaska, 1960-2012. Knowledge Network for Biocomplexity. [doi:10.5063/F18P5XTN](https://doi.org/10.5063/F18P5XTN).

Based on the most recent comprehensive household harvest surveys, salmon make up about 17% of the total subsistence harvests of wild foods in Norton Sound-Port Clarence Area (Nome Census District) communities, ranking second to marine mammals (50%) (Figure 10-3). However, the two relatively large communities on St. Lawrence Island, Gambell (population 714 in 2017) and Savoonga (population 758) harvest virtually no salmon – their harvests are 88% marine mammals. If these two communities are removed from area totals, salmon, while still ranking second, provides 24% of the total harvest, compared to 31% for marine mammals (Figure 10-4).

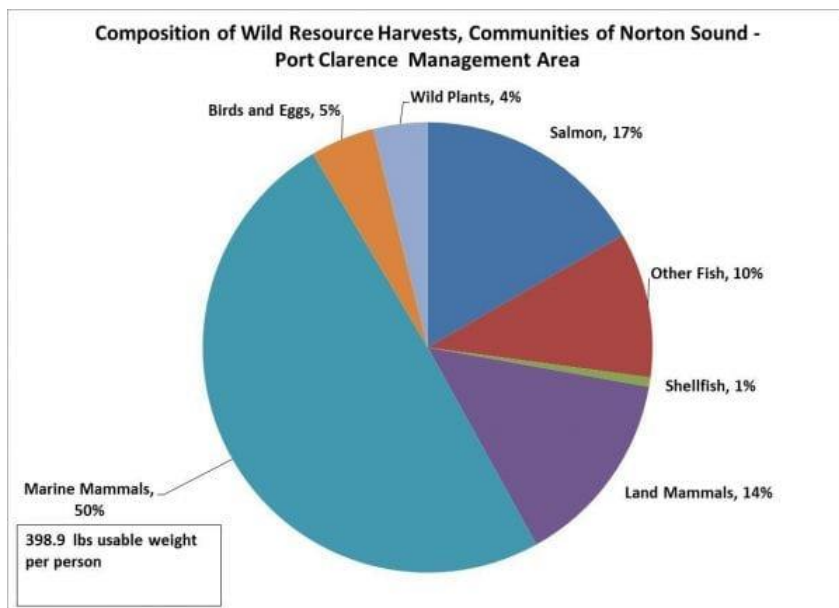


Fig. 10-3. Alaska Department of Fish and Game, Division of Subsistence. 2018. Subsistence harvest information by region, community, resource, and year, 1964-2015. Knowledge Network for Biocomplexity. [doi:10.5063/F1S75DNC](https://doi.org/10.5063/F1S75DNC).

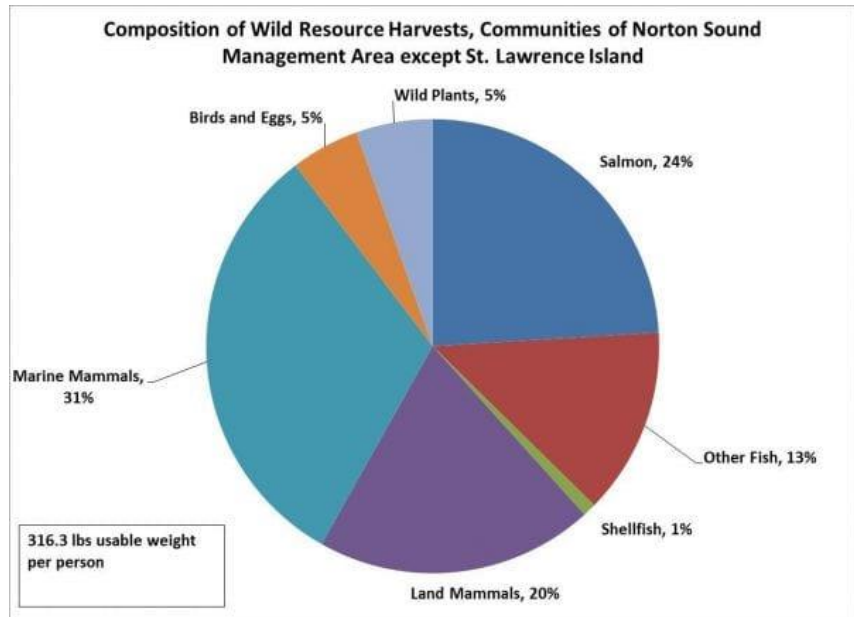


Fig. 10-4. Alaska Department of Fish and Game, Division of Subsistence. 2018. Subsistence harvest information by region, community, resource, and year, 1964-2015. Knowledge Network for Biocomplexity. [doi:10.5063/F1S75DNC](https://doi.org/10.5063/F1S75DNC).

## Salmon and Governance

Salmon governance in Norton Sound-Port Clarence area has relied on a state “Tier II” fishery to provide limited opportunity for harvests during weak chum runs near Nome from the late 1990s. Customary trade is authorized in both state and federal systems, providing for redistribution of fish during localized shortages. State management is predominant in this region, as most salmon fishing occurs in marine waters, and federal subsistence jurisdiction is limited to inland, navigable waters associated with the Yukon Delta NWR, the Bering Land Bridge National Preserve, and the Unalakleet Wild and Scenic River. When chum runs began to decline in the 1990s, the state instituted a Tier II fishery effectively limiting salmon harvest to local residents. In 2005, improved runs led to management as a Tier I fishery, with continued closure of commercial and sport salmon fishing. Subsistence harvests, with especially high reliance on pink salmon, have shown considerable variation and generally lower totals after 2008. Customary trade is authorized in both state and federal regulations and provides a vehicle for redistribution of fish to address localized shortages. Between 2000-2018, the Norton Sound salmon fisheries were declared a disaster on two occasions.

## References

**Burch, E. S. (1998). *The Iñupiaq Eskimo Nations of Northwest Alaska*. Fairbanks, Alaska: University of Alaska Press.**

**Fall, James A. et al. 2018. *Alaska Subsistence and Personal Use Salmon Fisheries 2015 Annual Report*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 440. Anchorage.**

**Jenkins, D. (2015). *Impacts of neoliberal policies on non-market fishing economies on the Yukon River, Alaska*. *Marine Policy*, 61, 356–365. <https://doi.org/10.1016/j.marpol.2014.12.004>**

**Magdanz James and Annie Olanna. 1984. *Controls on Fishing Behavior on the Nome River*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 102. Nome.**

**Magdanz, James. 1992. *Subsistence Salmon Fishing by Permit in the Nome Subdistrict and Portions of the Port Clarence District, 1975 – 91*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 220. Juneau.**

**Magdanz, James. S. 2007. *Customary Trade and Barter in Fish in the Seward Peninsula Area, Alaska*. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 328. Juneau.**

**Magdanz, J. S., Tahbone, S., Ahmasuk, A., Koster, D. S., & Davis, B. L. (2007). *Customary Trade and Barter in Fish in the Seward Peninsula Area, Alaska* (Technical Paper No. 328). Juneau, Alaska: Alaska Department of Fish and Game.**

**Magdanz, James S. et al. 2009. *Patterns and Trends in Subsistence Salmon Harvests, Norton Sound-Port Clarence Area, Alaska 1994 – 2003*. In *Pacific Salmon: Ecology and Management of Western Alaska's Populations*, Charles C. Krueger and Christian E. Zimmerman, editors, pp 395 – 431. *American Fisheries Society Symposium 70: Proceedings of the symposium Sustainability of the Arctic-Yukon-Kuskokwim Salmon Fisheries*. Bethesda, Maryland: American Fisheries Society.**

**Menard, J., Soong, J., Kent, S., Harlan, L., and Leon, J. (2017). 2015 Annual management report for Norton Sound, Port Clarence, and Arctic, Kotzebue Areas (Fishery Management Report No. 17-15) (p. 230). Anchorage, Alaska: Alaska Department of Fish and Game.**

**Raymond-Yakoubian, B., & Raymond-Yakoubian, J. (2015). "Always taught not to waste": Traditional Knowledge and Norton Sound/Bering Strait Salmon Populations (2015 Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative Project 1333). Retrieved from <http://www.kawerak.org/forms/nr/TK%20of%20Salmon%20Final%20Report.pdf>**