



United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
1011 East Tudor Road
Anchorage, Alaska 99503



In Reply Refer to:
FWS/R7/MMM

To: Diana Evans, Executive Director, North Pacific Fisheries Management Council
From: Peter Fasbender, Assistant Regional Director, Fisheries and Ecological Services
Date: October 7, 2026
Re: Executive Summary for NPFMC, Walrus in Bristol Bay

Introduction:

Representatives of the Qayassiq Walrus Commission (QWC) attended the December 2025 North Pacific Fisheries Management Council (NPFMC) meeting and raised concerns about the impacts of fisheries and human disturbance on Pacific walrus space use and habitat quality at the Round Island haulout and the surrounding area. In response to this request, the U.S. Fish and Wildlife Service (USFWS) Marine Mammals Management (MMM) reviewed the available information on Pacific walrus in the Bristol Bay region, focusing on the following categories: population, habitat use, prey availability, and potential stressors. Below, we summarize the key findings of this literature review, particularly in the context of Round Island and surrounding fisheries.

Background:

The Pacific walrus exists as a single migratory population distributed across the Bering and Chukchi Seas and coasts of western Alaska and eastern Russia. During the ice-free summer months, a subset of the population's adult males occupies Bristol Bay, foraging on benthic invertebrates on the continental shelf and resting at coastal haulouts. Several coastal haulouts in Bristol Bay (e.g., Round Island, Cape Peirce) have been historically used by walrus for centuries or millennia (Fischbach et al. 2016; Schaaf 2017), whereas others have occurred on a more intermittent basis or become colonized in recent years (Fischbach et al. 2016). Haulout use fluctuates within and between years driven by a variety of factors including localized ice and weather conditions, availability of prey, and repeated human disturbances. Since the 1960s, various research and monitoring programs have sought to characterize walrus biology and space use in the Bristol Bay region.

Various vessel, aircraft, and fishing regulations have been implemented in Northern Bristol Bay to reduce disturbances at Pacific walrus haulouts and help to conserve benthic habitat. These include a 3 nautical mile no-transit zone for vessels and aircraft around Round Island, a 12 nautical mile no-transit zone for vessels with a Federal Fishing Permit around Round Island and Cape Peirce (with seasonal open transit zones later established), and a closure to trawling in Bristol Bay, with the exception of the Northern Bristol Bay Trawl Area (NBBTA; Figure 1). In recent years, the NBBTA yellowfin sole trawl fishery is the only federally-managed fishery in the region (operating April 1-May 31).

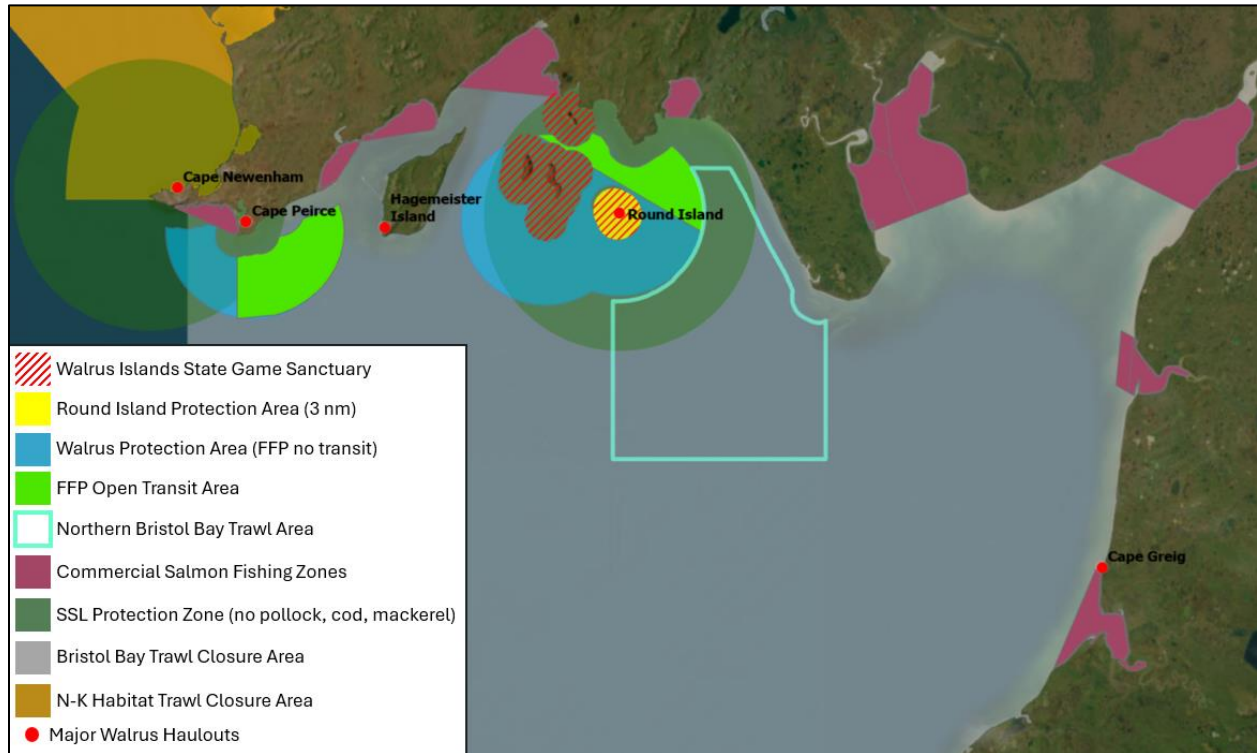


Figure 1. Northern Bristol Bay haulout sites, fishery zones, and walrus protection areas. Sources: NMFS Alaska Region, ADFG Commercial Fisheries.

Population

The most recent available data indicates that the Pacific walrus population overall is large (approximately 257,000 animals; Beatty et al. 2022) and stable (Taylor et al. 2018), although models project that sea ice loss and human disturbance may contribute to a decline in abundance throughout the 21st century (Johnson et al. 2024). Of the estimated 71,000 adult males in the population (Beatty et al. 2022), a subset occupies Bristol Bay and southwestern Alaska in the summer, although the abundance of this group of animals has never been comprehensively estimated. Haulout counts may provide a snapshot of abundance at a particular location, but it is difficult to estimate their total abundance because walrus use multiple haulouts within a season and spend a large portion of their time at sea. Thus, the number of walrus observed at a haulout at a given time represents a portion of the walrus occupying the broader area. Nonetheless, haulout monitoring efforts and censuses can provide an estimate of minimum abundance, along with important information regarding trends in space use.

When the Walrus Islands State Game Sanctuary was established in 1960, Round Island was recognized as the “last remaining terrestrial haulout” after other sites in southwestern Alaska had been abandoned, likely due to disturbances from commercial hunting (Weiss et al. 2024). The ADFG has monitored the Round Island haulout annually since the 1970s, providing a long-term dataset on peak and annual mean haulout use and seasonality. Annual peak haulout numbers at Round Island have fluctuated year-to-year from >13,000 (1979; Taggart & Zabel 1985) to

<1,000 (2016; Weiss et al. 2024). Generally, both peak and mean haulout numbers at Round Island have moderately declined in the past two decades (Weiss et al. 2024). The ADFG Division of Wildlife Conservation may be able to provide the most up-to-date information on Round Island use and occupancy patterns over the past several years.

In the early 1980s, large haulouts began to form consistently at Cape Peirce, Cape Newenham, and Cape Seniavin (summarized by Fischbach et al. 2016), concurrent with a seasonal and general decline in Round Island occupancy. USFWS Togiak NWR field crews actively monitored the Cape Peirce and Newenham haulout sites from 1985-2006, and it was passively monitored via remote cameras from 2006-present (summarized by Holt 2019). Peak haulout numbers at Capes Peirce/Newenham varied year-to-year and significantly declined from a maximum of >12,000 in 1985 to <1000 in the early 2000s (Holt 2019). Cape Seniavin has seen regular use by several hundred to several thousand walrus during the summer months since the late 1970s, although monitoring efforts have been sporadic (summarized by Fischbach et al. 2016).

Since the early 2000s, other sites in Bristol Bay have seen colonization and increased use by adult male walrus during the summer months: Hagemester Island (first regularly occupied in 2005, maximum count of 3,600 in 2012; Holt 2019); Cape Greig (first regularly occupied in 2016, maximum count of over 3,000; Fischbach et al. 2016); Cinder River (first regularly occupied in 2018, maximum count of 7,690 in 2019; C Peterson ADFG); and a group of >1,000 walrus occupying haulouts along the Alaska Peninsula each summer since 2014 (Izembek Lagoon, Amak Island, and Oksenof Point; Lowe 2015; Figure 2). In a review of Sentinel-2 satellite imagery, there was evidence of thousands of walrus occupying haulouts in both central Bristol Bay (e.g., Cape Seniavin, Cinder River, Cape Greig) and the Alaska Peninsula (e.g., Izembek Lagoon, Amak Island, Oksenof Point) concurrent with the Round Island occupancy season (April-September) in each year 2017-2025 (USFWS 2026, unpublished report). There is thus evidence of a shift in seasonal space use in Bristol Bay within the past two decades, but not necessarily a decline in the abundance of walrus using Bristol Bay as a whole. A comprehensive haulout monitoring effort leveraging recent advances in satellite imagery analysis (e.g., Fischbach et al. 2025; Cubaynes et al. 2026) may allow for further analysis of walrus abundance and seasonal space use in Bristol Bay in the near future.



Figure 2. Major Bristol Bay and Alaska Peninsula haulout sites active in the past decade (estimated to be occupied by >1,000 walrus 2016-2025; USFWS unpublished data 2026). Inset: Pacific walrus winter (blue) and summer (green) range in the Bering and Chukchi Seas, with 150 historical haulout sites (gray, Fischbach et al. 2016) and sites that have been used in recent years (orange, review of Sentinel-2 imagery 2016-2025, USFWS 2026).

Habitat Use:

Although haulout occupancy data may provide a general idea for walrus seasonal space use, information about specific seasonal in-water movements and foraging locations within Bristol Bay is limited. Aerial and shipboard surveys conducted in the 1970s and 1980s identified high-density walrus use areas in western Bristol Bay, and along the coast from Port Moller to Ugashik in April (Summarized by Fay 1982, Fay & Lowry 1981). Satellite telemetry data from adult males tagged between 1987 and 2008 at Bristol Bay haulouts (summarized by Jay et al. 2022) provides the most contemporary and detailed information on in-water habitat use, although sample sizes were small and varied within and between years. Tagged walrus spent approximately 75 percent of their time in water and 25 percent of their time on land during the summer months, making 4-10 day foraging trips ranging up to 130 km from coastal haulouts and typically foraging in areas shallower than 60 m (Jay et al. 2001, Jay & Hills 2005). A general seasonal pattern of use was observed, with walrus using the southern and central portions of Bristol Bay in the spring-early summer, and moving to the western portion of Bristol Bay in the fall (Jay & Hills, 2005). A side-scan sonar survey effort in 2004 identified areas with walrus foraging marks, giving some insight into high-density foraging areas in those years, and broadly agreed with the available satellite telemetry data (Bornhold et al. 2005).

In the context of Round Island and surrounding fisheries, there was a moderate degree of overlap between the Northern Bristol Bay Trawl Area, walrus at-sea GPS locations from April-June 2003-2008 (FWS analysis of data from Jay et al 2022), and high-density walrus foraging tracks in 2004 (Bornhold et al. 2005). Future satellite telemetry studies or aerial surveys will be needed to further describe Pacific walrus habitat use in the region.

Prey Availability:

Pacific walruses feed primarily on benthic invertebrates – including bivalves, gastropods, polychaete worms, and tunicates, but diets are known to vary broadly on a spatial and temporal basis (Fay 1982, Sheffield & Grebmeier 2009). Walrus diet data specific to Bristol Bay is limited. A 1981 stomach content analysis in southern Kuskokwim Bay indicated that 96 percent of their diet by weight was bivalve mollusks (Fay & Lowry, 1981). Most recently, a DNA metabarcoding study analyzed 56 fecal samples taken from four haulout locations throughout the Bristol Bay region (Round Island, Hagemeister Island, Cape Seniavin, and Izembek Lagoon) between 2014-2018 (Maniscalco et al. 2020), indicating that polychaete worms, tunicates, gastropods, and bivalves were the most important prey groups overall, but that there was a wide degree of variability between sites and years. Due to the apparent differences from the 1981 diet study, the authors proposed a temporal shift in walrus prey that could represent a changing benthic ecosystem due to warming waters in recent decades (Maniscalco et al. 2020). Prey availability data specific to walrus forage species and areas within Bristol Bay are similarly limited.

An analysis of benthic macroinfauna data from flatfish trawl habitat studies across the Alaskan Bering Sea continental shelf from 2006-2021 indicated that at a broad scale, the general patterns of infauna abundance, distribution, and species composition had not markedly changed since the 1970s (Yueng & Yang 2025). Specifically, species composition, biomass, and distribution patterns in the southern region of the study (overlapping Bristol Bay) indicated that polychaetes and bivalves were similarly abundant to historical levels, and historical benthic hotspots in the region have persisted (Yueng & Yang 2025). NOAA's Eastern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Fauna has also performed systematic surveys of the region, collecting invertebrate biomass data since 1982 (e.g., Markowitz et al. 2026), which may serve as a useful index of Pacific walrus prey availability. Preliminary analysis of this dataset (USFWS, unpublished data) indicated that the biomass of important walrus prey items (combining polychaete worms, tunicates, gastropods, and bivalves into a single group) has significantly declined at 32 percent of stations within Bristol Bay (1982-2025), concurrent with significant increases at stations further southwest (i.e., off the coast of the southern Alaska Peninsula; Figure 3) where trawling is permitted and occurs at similar levels to the NBBTA. Further work is needed to explore fine-scale prey availability trends and potential fisheries interactions for specific taxa and regions within Bristol Bay.

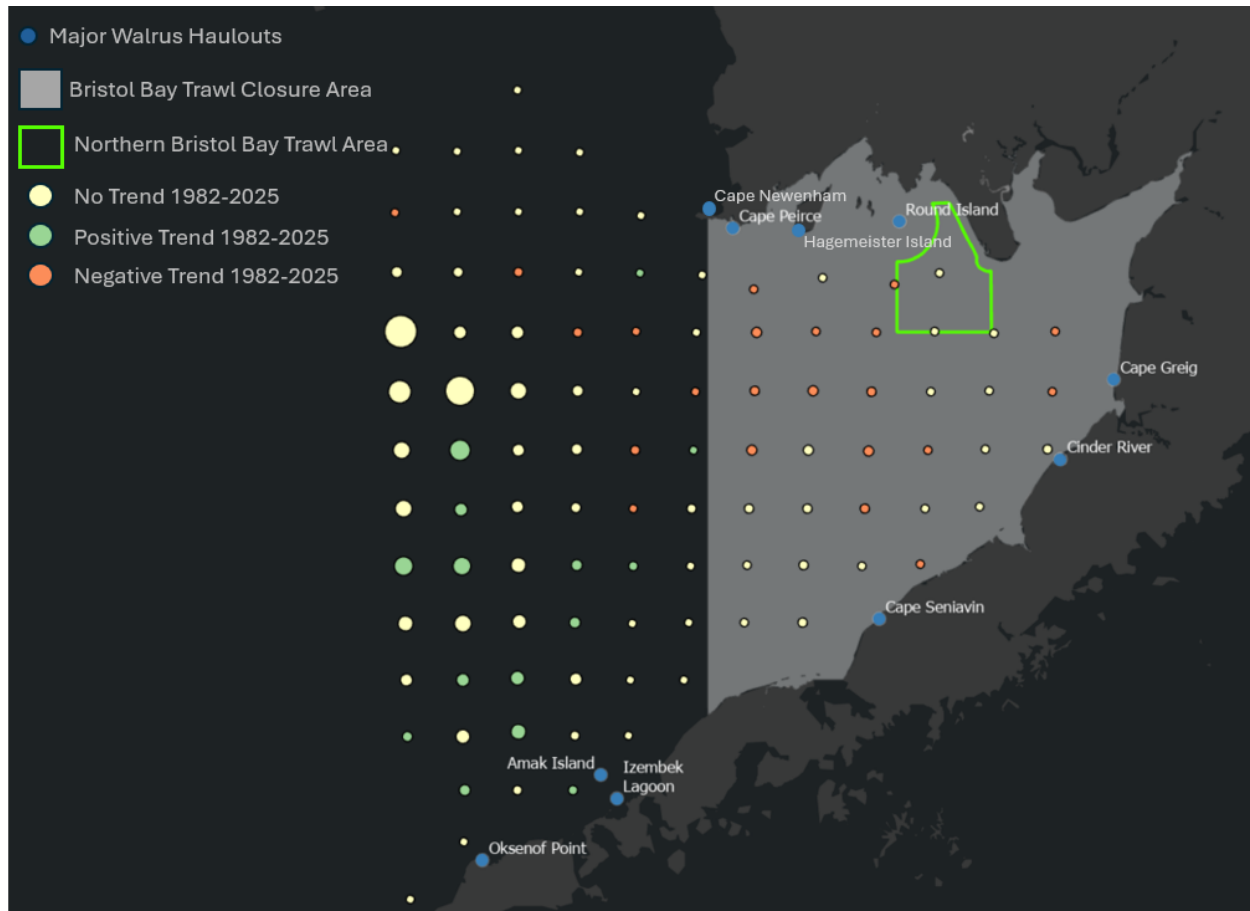


Figure 3. Eastern Bering Sea Continental Shelf Bottom Trawl Survey Stations in Bristol Bay and the surrounding area. Stations are systematically and annually surveyed to estimate groundfish and invertebrate fauna biomass (e.g., Markowitz et al. 2026). Displayed are combined biomass estimates for four invertebrate taxa groups known to be key walrus prey resources: bivalves, polychaetes, tunicates, and gastropods. The size of each point corresponds to the mean of annual biomass estimated at each survey location (ranging from 0.28 kg/yr to 542 kg/yr). A linear model of combined biomass by year (1982-2025) was conducted at each point, and the color corresponds to the significance ($p < 0.05$) and direction of the trend (green = significant positive trend, beige = no significant trend, red = significant negative trend). Key walrus haulouts are displayed, along with the Northern Bristol Bay Trawl Area. Data accessed from the NOAA Alaska Groundfish Survey database (<https://www.fisheries.noaa.gov/foss>).

Potential Stressors:

Human disturbance at coastal walrus haulouts has long been recognized as a major stressor that can result in direct mortality and temporary or long-term haulout abandonment (e.g., Fay et al. 1982; Udevitz et al. 2013). Walrus occupying coastal haulouts are particularly sensitive to vessel and aircraft noise, which can cause stampedes that result in trampling mortalities. Although trampling mortalities from haulout disturbances are more common in mixed haulouts of adults and juveniles in the Chukchi Sea (summarized in MacCracken et al. 2017), they do occur among adult males occupying Bristol Bay haulouts as well (e.g., in MacDonald & Winfree 2006). In addition to haulout disturbances, in-water acoustic disturbances from vessel traffic may

displace walrus from high-quality foraging grounds or migratory pathways (Fay 1982; Metcalf et al. 2024; Coppolaro et al. 2025) that can lead to changes in behavior and space use, and cause chronic disturbance which over time may influence body condition and survival (Johnson et al. 2024).

Annual haulout monitoring efforts in the 1980s-2000s at Round Island, Cape Peirce, and Cape Seniavin recorded detailed disturbance data including the causes, distances, and intensities of haulout disturbances from aircraft, vessels, and visitors on foot. These studies led to the establishment of a 3-mi restricted transit area around Round Island in the 1980s, and the development of generalized vessel and aircraft guidelines designed to reduce disturbance events and MMPA violations ([Approach and Viewing Guidelines for Pacific Walrus | U.S. Fish & Wildlife Service](#)). At Round Island, there is evidence of good compliance with the 3-nm restricted area, but there is also some evidence that dispersal-level events have been caused by vessels and aircraft originating from outside of that boundary (Weiss et al. 2024). At other haulouts in Bristol Bay, a preliminary analysis of AIS data (Kleine et al. 2021, FWS unpublished report) suggests that vessels regularly encroached the radii established by FWS guidelines in 2020 and 2021.

Direct interactions between Pacific walrus and Alaskan fisheries are limited. Between 2013-2023, there was one reported incidental mortality of a walrus caught in trawl gear, and 40 reported instances of decomposed walrus carcasses turning up in commercial fishing nets (USFWS 2023). While direct by-catch of walrus is minimal, concerns remain for fisheries impacts on walrus prey availability and foraging habitat, and the impacts of fishing vessel disturbances on walrus at sea and at coastal haulouts. Commercial bottom trawling has been shown to negatively impact Pacific walrus prey resources (e.g., McConnaughey et al. 2000), although a more recent study with modified trawl equipment found that environmental factors (i.e., storm surges) had more of an impact on the benthic community than an experimental trawl at their study site in western Bristol Bay (McConnaughey et al. 2014).

Current and Future Projects to Address Data Needs:

To better understand the extent and effect of vessel traffic near Pacific walrus haulouts, the USFWS is in the preliminary stages of a broad-scale analysis of AIS vessel tracking data. Leveraging a publicly available database of vessel presence and fishing effort data from 2017-present (via Global Fishing Watch), this study will build upon preliminary work conducted in 2020-2021 at a subset of walrus haulouts (Kleine et al. 2021 FWS unpublished report), expanding the analysis to all available years at 54 haulout sites across Pacific walrus range known to be active within the past 10 years. This study will create greater understanding of the level and seasonality of vessel traffic and fishing activities at different radii around haulout sites, and allow for a comparison of vessel traffic patterns between sites and years. In the context of Bristol Bay walrus-fisheries issues, it will also help to ground-truth fisheries patterns observed by Alaska Native community members, and identify potential encroachment by vessels in protected areas. Our estimated timeline for this project is to complete this analysis by Spring 2027, communicate results to co-management partners, and prepare a peer-reviewed publication by the end of 2027.

Analysis of satellite imagery has become a powerful tool in recent years to identify Pacific walrus haulout occupancy and space use (e.g., Fischbach et al. 2025; Cubaynes et al. 2026). The USFWS has conducted a preliminary review of Sentinel-2 imagery from 2017-2025 at 150 historical haulout sites across Pacific walrus range, with the goal of updating the Pacific Walrus Coastal Haulout Database (Fischbach et al. 2016) with relevant information regarding recent walrus space use patterns. Specifically, the updated database (scheduled for publication early 2027) will provide information about seasonal haulout use in Bristol Bay over the past decade that may be relevant to managers and stakeholder groups. Further development of satellite methods (e.g., density estimation at Bristol Bay haulouts, development of AI tools) may allow for more detailed and comprehensive haulout monitoring in the future.

Literature Cited:

- Beatty, W. S., Lemons, P. R., Everett, J. P., Lewis, C. J., Taylor, R. L., Lynn, R. J., Sethi, S. A., Quakenbush, L., Citta, J. J., Kissling, M. L., Kryukova, N., & Wenburg, J. K. 2022. Estimating Pacific walrus abundance and survival with multievent mark-recapture models. *Marine Ecology Progress Series*, 697, 167–182. <https://doi.org/10.3354/meps14131>
- Bornhold B. D., Jay C. V., McConnaughey R., Rathwell G., Rhynas K., Collins W. 2005. Walrus foraging marks on the seafloor in Bristol Bay, Alaska: a reconnaissance survey. *Geo-Mar Lett* (2005) 25: 293–299. DOI: 10.1007/s00367-004-0205-y
- Coppolaro V. L. M, Ausen E. L., Loseto L. L.. & Marcoux M. 2025. Vessel traffic disrupts walrus vocal behavior in a proposed marine protected area. *Front. Mar. Sci.* 12:1658328. doi: 10.3389/fmars.2025.1658328
- Cubaynes, H. C., Vergara-Pena, A., Bowler, E., Downie, R., Forcada, J., Garde, E., Heide-Jørgensen, M. P., Higdon, J. W., Ida, E., Kovacs, K. M., Lancaster, M. L., Lapointe St-Pierre, M., Lydersen, C., Matthews, C. J. D., Spencer, M., & Fretwell, P. T. (2026). A roadmap towards monitoring walruses from space. *ICES Journal of Marine Science*, 83(2), fsag017. <https://doi.org/10.1093/icesjms/fsag017>
- Fay F. H., Lowry L. F. 1981. Seasonal use and feeding habits of walruses in the proposed Bristol Bay Clam Fishery Area. Report to the North Pacific Fishery Management Council, November 1981.
- Fay, F. H. 1982. Ecology and biology of the Pacific walrus, *Odobenus rosmarus divergens* illiger. U.S. Department of the Interior, U.S. Fish and Wildlife Service, North American Fauna 74, Washington, D. C.
- Fischbach, A. S., Kochnev, A. A., Garlich-Miller, J. M., & Jay, C. V. 2016. *Pacific walrus coastal haulout database, 1852–2016* [Data set]. U.S. Geological Survey.
- Holt, R. D. 2019. Pacific walrus terrestrial haul-out use on Togiak National Wildlife Refuge, Alaska, 1985-2018. U.S. Fish and Wildlife Service. Togiak National Wildlife Refuge. Dillingham, Alaska. 45 pp.
- Jay, C. V., S. D. Farley, and G. W. Garner. 2001. Summer diving behavior of male walruses in Bristol Bay, Alaska. *Marine Mammal Science* 17:617-631.
- Jay, C. V., and S. Hills. 2005. Movements of walruses radio-tagged in Bristol Bay, Alaska. *Arctic* 58:192-202.
- Jay, C. V., A. S. Fischbach, A.A. Kochnev, S. Hills, and D. C. Douglas. 2022. Tracking data for Pacific walrus (*Odobenus rosmarus divergens*) (ver 1.0, June 2022): US Geological Survey data release.
- Johnson, D. L., J. M. Eisaguirre, R. L. Taylor, and J. L. Garlich-Miller. 2024. Assessing the population consequences of disturbance and climate change for the Pacific walrus. *Marine Ecology Progress Series* 740:193-211.
- Kleine L. 2021. 2021Walrus Haulout Geofence Monitoring Report. USFWS Marine Mammals Management, Anchorage, AK. [Unpublished Report]
- Lowe, S. 2015. Pacific Walrus presence on Unimak Island. Izembek NWR published memorandum.
- MacDonald R. & Winfree M. 2006. Marine Mammals haulout use in Bristol Bay and Southern Kuskokwim Bay, Alaska, 2006. A status report of the 2006 marine mammal monitoring effort at Togiak National Wildlife Refuge.

- Maniscalco, J. M., A. M. Springer, K. L. Counihan, T. Hollmen, H. M. Aderman, and M. Toyukak, Sr. 2020. Contemporary diets of walruses in Bristol Bay, Alaska suggest temporal variability in benthic community structure. *PeerJ* 8:e8735
- Markowitz E. H., Charriere N. E., Wassermann S. N., Rohan S. K. & Stevenson D.E. 2026. Results of the 2025 Eastern and Northern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Fauna. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-517, 177 p.
- McConnaughey, R. A., and S. E. Syrjala. 2014. Short-term effects of bottom trawling and a storm event on soft-bottom benthos in the eastern Bering Sea. *ICES Journal of Marine Science* 71:2469-2483.
- McConnaughey, R. A., S. E. Syrjala, and C. B. Dew. 2005. Effect of chronic bottom trawling on the size structure of soft-bottom benthic invertebrates. *American Fisheries Society Symposium* 41:425-437.
- Metcalf V., Apassingok D., Campbell I., Gologergen A., Gologergen B., Noongwok E., Huntington H.P., Garlich-Miller J.L., & Johnson D.L. 2025. Co-producing knowledge about the Pacific walrus and climate change. *Arctic Science* 11: 1–13 (2025) doi: [dx.doi.org/10.1139/as-2024-0061](https://doi.org/10.1139/as-2024-0061)
- Schaff, J.M. 2017. Archaeological Investigations at the Qayassiq Site (SNB-0043). Round Island, Walrus Islands State Game Sanctuary, Northern Bristol Bay, Alaska. Cultural Resource Report NPS/AKRO/CRR-2017/002.
- Sheffield, G., and J. M. Grebmeier. 2009. Pacific walrus (*Odobenus rosmarus divergens*): Differential prey digestion and diet. *Marine Mammal Science* 25:761–777.
- Taggart S.J. & Zabel C. J. 1985. Long-term changes in abundance of Pacific walruses, *Odobenus rosmarus divergens*, at Round Island and Cape Peirce. Togiak NWR field report.
- Udevitz, M. S., R. L. Taylor, J. L. Garlich-Miller, L.T. Quakenbush, and J.A. Snyder. 2013. Potential population-level effects of increased haulout-related mortality of Pacific walrus calves. *Polar Biology* 36:291-298.
- USFWS (U.S. Fish and Wildlife Service). 2023. Pacific walrus (*Odobenus rosmarus divergens*): Alaska Stock. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Marine Mammals Management, Anchorage, AK.
- USFWS (U.S. Fish and Wildlife Service). 2026. Pacific Walrus Haulout Occupancy Survey: 2016-2025 Sentinel-1 & Sentinel-2 Satellite Imagery. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Marine Mammals Management, Anchorage, AK. [Unpublished Report]
- Weiss EW, Archibald M, Stephens A. 2024. Walrus Islands State Game Sanctuary Annual Management Report 2021. Special Areas Management Report ADF&G/DWC/SAMR–2024–1.
- Yeung C. & Yang M. 2025. Macroinfauna communities on the Bering Sea continental shelf. *Marine Ecology Progress Series* 759. Doi: 10.3354/meps14841.