

References Cited: Beringia Distinct Population Segment (DPS) of Bearded Seals Critical Habitat

- ACIA. 2005. Arctic climate impact assessment. Cambridge University Press, Cambridge, United Kingdom. Accessed at: <https://www.apmap.no/publications>. (November 2019).
- Adams, J., and G. Silber. 2017. 2015 vessel activity in the Arctic. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-OPR-57.
- Aksenov, Y., E. E. Popova, A. Yool, A. J. G. Nurser, T. D. Williams, L. Bertino, and J. Bergh. 2017. On the future navigability of Arctic sea routes: high-resolution projections of the Arctic Ocean and sea ice. *Marine Policy* 75:300-317.
- Alabia, I. D., J. G. Molinos, S. I. Saitoh, T. Hirawake, T. Hirata, and F. J. Mueter. 2018. Distribution shifts of marine taxa in the Pacific Arctic under contemporary climate changes. *Diversity and Distributions* 24(11):1583-1597.
- Alaska Fisheries Science Center. 2020. AFSC/MML: Marine mammal aerial surveys in the Bering, Chukchi, and Beaufort seas, and Amundsen Gulf, 1979-2019. Accessed at: <https://www.fisheries.noaa.gov/inport/item/17338>. (May 2021).
- Andersen, M., A. M. Hjelset, I. Gjertz, C. Lydersen, and B. Gulliksen. 1999. Growth, age at sexual maturity and condition in bearded seals (*Erignathus barbatus*) from Svalbard, Norway. *Polar Biology* 21(3):179-185.
- Antonelis, G. A., S. R. Melin, and Y. A. Bukhtiyarov. 1994. Early spring feeding habits of bearded seals (*Erignathus barbatus*) in the central Bering Sea, 1981. *Arctic* 47(1):74-79.
- Arctic Council. 2009. Arctic marine shipping assessment 2009 report. Arctic Council, Tromsø, Norway. Accessed at: <https://pame.is/index.php/projects/arctic-marine-shipping/amsa>. (November 2019).
- Arctic Monitoring and Assessment Programme (AMAP). 2007. Arctic oil and gas 2007. Arctic Monitoring and Assessment Programme, Oslo, Norway. Accessed at: <https://www.apmap.no/publications>. (November 2019).
- Arctic Monitoring and Assessment Programme (AMAP). 2018. AMAP assessment 2018: Arctic Ocean acidification. Arctic Monitoring and Assessment Programme, Tromsø, Norway. Accessed at: <https://www.apmap.no/publications>. (December 2019).
- Baker, M. R., K. K. Kivva, M. N. Pisareva, J. T. Watson, and J. Selivanova. 2020. Shifts in the physical environment in the Pacific Arctic and implications for ecological timing and conditions. *Deep-Sea Research Part II: Topical Studies in Oceanography* 177:104802.

- Barron, M. G., D. N. Vivian, R. A. Heintz, and U. H. Yim. 2020. Long-term ecological impacts from oil spills: Comparison of Exxon Valdez, Hebei Spirit, and Deepwater Horizon. *Environmental Science & Technology* 54(11):6456-6467.
- Bengtson, J. L., L. M. Hiruki-Raring, M. A. Simpkins, and P. L. Boveng. 2005. Ringed and bearded seal densities in the eastern Chukchi Sea, 1999-2000. *Polar Biology* 28(11):833-845.
- Benjaminsen, T. 1973. Age determination and the growth and age distribution from cementum growth layers of bearded seals at Svalbard. *Fiskeridirektoratets Skrifter Serie Havundersoekelser* 16:159-170.
- Berchok, C. L., J. L. Crance, and P. J. Stabeno. 2019. Chukchi Sea acoustics, oceanography, and zooplankton study: Hanna Shoal extension (CHAOZ-X) and Arctic whale ecology study (ARCWEST) supplemental report. National Marine Fisheries Service, Alaska Fisheries Science Center, Marine Mammal Laboratory, OCS Study BOEM 2019-024, Seattle, Washington.
- Blanchard, A. L., C. L. Parris, A. L. Knowlton, and N. R. Wade. 2013. Benthic ecology of the northeastern Chukchi Sea. Part II. Spatial variation of megafaunal community structure, 2009-2010. *Continental Shelf Research* 67:67-76.
- Boveng, P. L., J. L. Bengtson, T. W. Buckley, M. F. Cameron, S. P. Dahle, B. P. Kelly, B. A. Megrey, J. E. Overland, and N. J. Williamson. 2009. Status review of the spotted seal (*Phoca largha*). U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-200.
- Boveng, P. L., and M. F. Cameron. 2013. Pinniped movements and foraging: seasonal movements, habitat selection, foraging and haul-out behavior of adult bearded seals in the Chukchi Sea. Bureau of Ocean Energy Management, Alaska Outer Continental Shelf Region, BOEM Report 2013-01150, Anchorage.
- Boye, T. K., M. J. Simon, K. L. Laidre, F. Riget, and K. M. Stafford. 2020. Seasonal detections of bearded seal (*Ergignathus barbatus*) vocalizations in Baffin Bay and Davis Strait in relation to sea ice concentration. *Polar Biology* 43(10):1493-1502.
- Braham, H., C. H. Fiscus, and D. Rugh. 1977. Marine mammals of the Bering and southern Chukchi seas. Pages 1-99 in Environmental assessment of the Alaskan continental shelf, annual reports of principal investigators for the year ending March 1977, volume 1. Outer Continental Shelf Environmental Assessment Program, National Oceanic and Atmospheric Administration, Environmental Research Laboratory, Boulder, Colorado.
- Braham, H. W., J. Burns, J., G. A. Fedoseev, and B. D. Krogman. 1981. Distribution and density of ice-associated pinnipeds in the Bering Sea. National Marine Fisheries Service,

Northwest and Alaska Fisheries Center, National Marine Mammal Laboratory, Seattle, Washington.

- Breed, G. A., M. F. Cameron, J. M. V. Ver Hoef, P. L. Boveng, A. Whiting, and K. J. Frost. 2018. Seasonal sea ice dynamics drive movement and migration of juvenile bearded seals *Erignathus barbatus*. *Marine Ecology Progress Series* 600:223-237.
- Brigham, L., and B. Ellis, editors. 2004. Arctic marine transport workshop, September 28-30, 2004. Institute of the North, U.S. Arctic Research Commission, and International Arctic Science Committee, Cambridge, United Kingdom. Accessed at: <https://oaarchive.arctic-council.org/handle/11374/26>. (January 2020).
- Bryan, A. L. 2017. Identifying bearded and ringed seal diet - a comparison of stomach contents, stable isotopes, fatty acids, and fecal DNA. Master's thesis. University of Alaska Fairbanks.
- Bureau of Ocean Energy Management (BOEM). 2011. Biological evaluation for oil and gas leasing and exploration activities in the Beaufort Sea and Chukchi Sea planning areas. Bureau of Ocean Energy Management, Alaska Outer Continental Shelf Region, Anchorage, Alaska.
- Burns, J. J. 1967. The Pacific bearded seal. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Project Report, Volume VIII: Projects W-6-R and W-14-R, Juneau.
- Burns, J. J. 1981. Bearded seal *Erignathus barbatus* Erxleben, 1777. Pages 145-170 in S. H. Ridgway, and R. J. Harrison, editors. *Handbook of marine mammals*, volume 2: seals. Academic Press, New York.
- Burns, J. J., and K. J. Frost. 1979. The natural history and ecology of the bearded seal, *Erignathus barbatus*. Pages 311-392 in Environmental assessment of the Alaskan continental shelf, final reports of principal investigators, volume 19 (1983). National Oceanic and Atmospheric Administration, National Ocean Service, Office of Oceanography and Marine Assessment, Ocean Assessments Division, Alaska Office, Juneau.
- Butler, T. H. 1980. Shrimps of the Pacific coast of Canada. Bulletin 202. Department of Fisheries and Oceans, Ottawa, Canada.
- Cameron, M., and P. Boveng. 2007. Abundance and distribution surveys for ice seals aboard USCG Healy and the Oscar Dyson, April 10-June 18, 2007. AFSC Quarterly Report, April-May-June 2007:12-14.
- Cameron, M., E. Moreland, and P. Boveng. 2008. Abundance and distribution surveys for ice seals conducted from the USCG icebreaker Polar Sea, April 6-April 27, 2008. AFSC Quarterly Report, April-May-June 2008:20-21.

- Cameron, M. F., J. L. Bengston, P. L. Boveng, J. K. Jansen, B. P. Kelly, S. P. Dahle, E. A. Logerwell, J. E. Overland, C. L. Sabine, G. T. Waring, and J. M. Wilder. 2010. Status review of the bearded seal (*Erignathus barbatus*). NOAA Technical Memorandum NMFS-AFSC-211.
- Cameron, M. F., K. J. Frost, J. M. Ver Hoef, G. A. Breed, A. V. Whiting, J. Goodwin, and P. L. Boveng. 2018. Habitat selection and seasonal movements of young bearded seals (*Erignathus barbatus*) in the Bering Sea. PLoS ONE 13(2):e0192743.
- Carroll, A. G., R. Przeslawski, A. Duncan, M. Gunning, and B. Bruce. 2017. A critical review of the potential impacts of marine seismic surveys on fish & invertebrates. Marine Pollution Bulletin 114(1):9-24.
- Carroll, S. S., L. Horstmann-Dehn, and B. L. Norcross. 2013. Diet history of ice seals using stable isotope ratios in claw growth bands. Canadian Journal of Zoology 91(4):191-202.
- Chapskii, K. K. 1938. The bearded seal (*Erignathus barbatus* Fabr.) of the Kara and Barents seas. Pages 7-70 in Game mammals of the Barents and Kara seas, volume 123. Arctic Institute Glavsevmorputi, Leningrad, USSR. (Translated from Russian in Translation Series Number 3162, 1974, Department of the Environment, Fisheries and Marine Service, Sainte-Anne-de-Bellevue, Quebec, Department of the Secretary of State of Canada, Translation Bureau, Multilingual Services Division).
- Chou, E., R. Antunes, S. Sardelis, K. M. Stafford, L. West, C. Spagnoli, B. L. Southall, M. Robards, and H. C. Rosenbaum. 2019. Seasonal variation in Arctic marine mammal acoustic detection in the northern Bering Sea. Marine Mammal Science, Early View 2019:1-26.
- Cleator, H. J., and I. Stirling. 1990. Winter distribution of bearded seals (*Erignathus barbatus*) in the Penny Strait area, Northwest Territories, as determined by underwater vocalizations. Canadian Journal of Fisheries and Aquatic Sciences 47(6):1071-1076.
- Cleator, H. J., I. Stirling, and T. G. Smith. 1989. Underwater vocalizations of the bearded seal (*Erignathus barbatus*). Canadian Journal of Zoology 67(8):1900-1910.
- Coffing, M., C. L. Scott, and C. J. Utermohle. 1999. The subsistence harvest of seals and sea lions by Alaska Natives in three communities of the Yukon-Kuskokwim Delta, Alaska, 1998-99. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper 257, Juneau.
- Conn, P. B., J. M. Ver Hoef, B. T. McClintock, E. E. Moreland, J. M. London, M. F. Cameron, S. P. Dahle, and P. L. Boveng. 2014. Estimating multispecies abundance using automated detection systems: ice-associated seals in the Bering Sea. Methods in Ecology and Evolution 5:1280-1293.

- Crawford, J. A., L. T. Quakenbush, and J. J. Citta. 2015. A comparison of ringed and bearded seal diet, condition and productivity between historical (1975–1984) and recent (2003–2012) periods in the Alaskan Bering and Chukchi seas. *Progress in Oceanography*:133-150.
- Dehn, L. A., G. G. Sheffield, E. H. Follmann, L. K. Duffy, D. L. Thomas, and T. M. O'Hara. 2007. Feeding ecology of phocid seals and some walrus in the Alaskan and Canadian Arctic as determined by stomach contents and stable isotope analysis. *Polar Biology* 30(2):167-181.
- Divine, L. M., F. J. Mueter, G. H. Kruse, B. A. Bluhm, S. C. Jewett, and K. Iken. 2019. New estimates of weight-at-size, maturity-at-size, fecundity, and biomass of snow crab, *Chionoecetes opilio*, in the Arctic Ocean off Alaska. *Fisheries Research* 218:246-258.
- Fay, F. H. 1974. The role of ice in the ecology of marine mammals of the Bering Sea. Pages 383-399 in D. W. Hood, and E. J. Kelley, editors. *Oceanography of the Bering Sea with emphasis on renewable resources. Proceedings of the International Symposium for Bering Sea Study*. University of Alaska, Institute of Marine Science, Occasional Publication 2, Fairbanks.
- Fay, F. H. 1982. Ecology and biology of the Pacific walrus, *Odobenus rosmarus divergens* Illiger. *North American Fauna* 74:1-279.
- Fedoseev, G. A. 2000. Population biology of ice-associated forms of seals and their role in the northern Pacific ecosystems. Center for Russian Environmental Policy, Russian Marine Mammal Council, Moscow, Russia. (Translated from Russian by I. E. Sidorova).
- Fedoseev, G. A., Y. V. Razlivalov, and G. G. Bobrova. 1988. Distribution and abundance of the ice forms of pinnipeds on the ice of the Bering Sea in April and May 1987. Pages 42-59 in N. S. Chernysheva, editor. *Scientific research on sea mammals of the northern part of the Pacific Ocean in 1986-1987*. All-Union Scientific Research Institute of Sea Fisheries and Oceanography (VNIRO), Moscow, Russia. (Translated from Russian in Canadian Translation of Fisheries and Aquatic Sciences 5506, 1990, Canada Institute for Scientific and Technical Information, National Research Council, Ottawa).
- Feltz, E. T., and F. H. Fay. 1966. Thermal requirements in vitro of epidermal cells from seals. *Cryobiology* 3(3):261-264.
- Fetterer, F., K. Knowles, W. Meier, M. Savoie, and A. K. Windnagel. 2017. Sea ice index. Version 3.0 (released October 2017). National Snow and Ice Data Center, Boulder, Colorado. Accessed at: <https://doi.org/10.7265/N5K072F8>. (October 2019).
- Fournet, M. E. H., M. Silvestri, C. W. Clark, H. Klinck, and A. N. Rice. 2021. Limited vocal compensation for elevated ambient noise in bearded seals: implications for an

industrializing Arctic Ocean. Proceedings of the Royal Society B-Biological Sciences 288(1945):20202712.

Frey, K. E., G. W. K. Moore, L. W. Cooper, and J. M. Grebmeier. 2015. Divergent patterns of recent sea ice cover across the Bering, Chukchi, and Beaufort seas of the Pacific Arctic Region. Progress in Oceanography 136:32-49.

Frost, K. J., and L. F. Lowry. 1983. Demersal fishes and invertebrates trawled in the northeastern Chukchi and western Beaufort seas, 1976-77. U.S. Department of Commerce, National Ocean and Atmospheric Administration, National Marine Fisheries Service, NOAA Technical Report NMFS SSRF-764, Rockville, Maryland.

Frost, K. J., A. Whiting, M. F. Cameron, and M. A. Simpkins. 2008. Habitat use, seasonal movements and stock structure of bearded seals in Kotzebue Sound, Alaska. Final Report, Tribal Wildlife Grants Study U-4-IT, prepared by the Native Village of Kotzebue to the U.S. Fish and Wildlife Service, Anchorage, Alaska.

Frouin-Mouy, H., X. Mouy, B. Martin, and D. Hannay. 2016. Underwater acoustic behavior of bearded seals (*Erignathus barbatus*) in the northeastern Chukchi Sea, 2007–2010. Marine Mammal Science 32(1):141-160.

Gadamus, L., J. Raymond-Yakoubian, R. Ashenfelter, A. Ahmasuk, V. Metcalf, and G. Noongwook. 2015. Building an indigenous evidence-base for tribally-led habitat conservation policies. Marine Policy 62:116-124.

Gjertz, I., K. M. Kovacs, C. Lydersen, and Ø. Wiig. 2000. Movements and diving of bearded seal (*Erignathus barbatus*) mothers and pups during lactation and post-weaning. Polar Biology 23(8):559-566.

Grebmeier, J. M., B. A. Bluhm, L. W. Cooper, S. G. Denisenko, K. Iken, M. Kędra, and C. Serratos. 2015. Time-series benthic community composition and biomass and associated environmental characteristics in the Chukchi Sea during the RUSALCA 2004–2012 program. Oceanography 28(3):116-133.

Grebmeier, J. M., K. E. Frey, L. W. Cooper, and M. Kędra. 2018. Trends in benthic macrofaunal populations, seasonal sea ice persistence, and bottom water temperatures in the Bering Strait region. Oceanography 31(2):136-151.

Gross, J., B. Konar, T. Brey, and J. M. Grebmeier. 2017. Size-frequency distribution, growth, and mortality of snow crab (*Chionoecetes opilio*) and arctic lyre crab (*Hyas coarctatus*) in the Chukchi Sea from 2009 to 2013. Deep-Sea Research Part II 144:142-155.

Gryba, R., H. P. Huntington, A. L. Von Duyke, B. Adams, B. Frantz, J. Gatten, Q. Harcharek, H. Olemaun, R. Sarren, J. Skin, G. H. R. Henry, and M. Auger-Méthé. 2021. Indigenous knowledge of bearded seal (*Erignathus barbatus*), ringed seal (*Pusa hispida*), and spotted

seal (*Phoca largha*) behaviour and habitat use near Utqiāġvik, Alaska. Arctic Science:Accepted manuscript.

- Gryba, R. D., F. K. Wiese, B. P. Kelly, A. L. Von Duyke, R. S. Pickart, and D. A. Stockwell. 2019. Inferring foraging locations and water masses preferred by spotted seals *Phoca largha* and bearded seals *Erignathus barbatus*. Marine Ecology Progress Series 631:209-224.
- Hamilton, C. D., C. Lydersen, M. A. Fedak, C. Freitas, M. A. Hindell, and K. M. Kovacs. 2019. Behavioural ontogeny of bearded seals *Erignathus barbatus* through the first year of life. Marine Ecology Progress Series 627:179-194.
- Hannay, D. E., J. Delarue, X. Mouy, B. S. Martin, D. Leary, J. N. Oswald, and J. Vallarta. 2013. Marine mammal acoustic detections in the northeastern Chukchi Sea, September 2007-July 2011. Continental Shelf Research 67:127-146.
- Harding, K. C., M. Fujiwara, Y. Axberg, and T. Häkkinen. 2005. Mass-dependent energetics and survival in harbour seal pups. Functional Ecology 19(1):129-135.
- Hawkins, A. D., A. E. Pembroke, and A. N. Popper. 2015. Information gaps in understanding the effects of noise on fishes and invertebrates. Reviews in Fish Biology and Fisheries 25(1):39-64.
- Hawkins, A. D., and A. N. Popper. 2017. A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates. ICES Journal of Marine Science 74(3):635-651.
- Heimrich, A. F., W. D. Halliday, H. Frouin-Mouy, M. K. Pine, F. Juanes, and S. J. Insley. 2021. Vocalizations of bearded seals (*Erignathus barbatus*) and their influence on the soundscape of the western Canadian Arctic. Marine Mammal Science 37(1):173-192.
- Heptner, L. V. G., K. K. Chapskii, V. A. Arsen'ev, and V. T. Sokolov. 1976. Bearded seal *Erignathus barbatus* (Erxleben, 1777). Pages 166-217 in L. V. G. Heptner, N. P. Naumov, and J. G. Mead, editors. Mammals of the Soviet Union, volume II, part 3, pinnipeds and toothed whales, Pinnipedia and Odontoceti. Vysshaya Shkola Publishers, Moscow, Russia. (Translated from Russian by P. M. Rao, 1996, Science Publishers, Lebanon, New Hampshire).
- Héroux, O. 1960. Mitotic rate in the epidermis of warm- and cold-acclimated rats. Biochemistry and Cell Biology 38(2):135-142.
- Hindell, M. A., C. Lydersen, H. Hop, and K. M. Kovacs. 2012. Pre-partum diet of adult female bearded seals in years of contrasting ice conditions. PLoS One 7(5):e38307.

- Hjelset, A. M., M. Andersen, I. Gjertz, C. Lydersen, and B. Gulliksen. 1999. Feeding habits of bearded seals (*Erignathus barbatus*) from the Svalbard area, Norway. *Polar Biology* 21(3):186-193.
- Holsvik, R. 1998. Maternal behaviour and early behavioural ontogeny of bearded seals (*Erignathus barbatus*) from Svalbard, Norway. Master's thesis. Norwegian University of Science and Technology, Trondheim, Norway.
- Huntington, H. P. 2000. Traditional ecological knowledge of seals in Norton Bay, Alaska. Report prepared by Huntington Consulting to the Elim-Shaktoolik-Koyuk Marine Mammal Commission and the National Marine Fisheries Service. (Translated by Clara Sookiyak, Shaktoolik, Alaska).
- Huntington, H. P., R. Daniel, A. Hartsig, K. Harun, M. Heiman, R. Meehan, G. Noongwook, L. Pearson, M. Prior-Parks, and M. Robards. 2015a. Vessels, risks, and rules: Planning for safe shipping in Bering Strait. *Marine Policy* 51:119-127.
- Huntington, H. P., S. L. Danielson, F. K. Wiese, M. Baker, P. Boveng, J. J. Citta, A. De Robertis, D. M. S. Dickson, E. Farley, J. C. George, K. Iken, D. G. Kimmel, K. Kuletz, C. Ladd, R. Levine, L. Quakenbush, P. Stabeno, K. M. Stafford, D. Stockwell, and C. Wilson. 2020. Evidence suggests potential transformation of the Pacific Arctic ecosystem is underway. *Nature Climate Change* 10(4):342-348.
- Huntington, H. P., M. Nelson, and L. T. Quakenbush. 2015b. Traditional knowledge regarding ringed seals, bearded seals, and walrus near St. Michael and Stebbins, Alaska. Final Report (Contract M13PC00015) prepared by Huntington Consulting and the Alaska Department of Fish and Game to the Eskimo Walrus Commission, the Ice Seal Committee, and the Bureau of Ocean Energy Management.
- Huntington, H. P., M. Nelson, and L. T. Quakenbush. 2016. Traditional knowledge regarding ringed seals, bearded seals, walrus, and bowhead whales near Kivalina, Alaska. Final Report (Contract M13PC00015) prepared by Huntington Consulting and the Alaska Department of Fish and Game to the Eskimo Walrus Commission, the Ice Seal Committee, and the Bureau of Ocean Energy Management.
- Huntington, H. P., M. Nelson, and L. T. Quakenbush. 2017a. Traditional knowledge regarding marine mammals near Hooper Bay, Alaska. Final Report (Contract M13PC00015) prepared by Huntington Consulting and the Alaska Department of Fish and Game to the Eskimo Walrus Commission, the Ice Seal Committee, and the Bureau of Ocean Energy Management.
- Huntington, H. P., M. Nelson, and L. T. Quakenbush. 2017b. Traditional knowledge regarding marine mammals near Mekoryuk, Alaska. Final Report (Contract M13PC00015) prepared by Huntington Consulting and the Alaska Department of Fish and Game to the

Eskimo Walrus Commission, the Ice Seal Committee, and the Bureau of Ocean Energy Management.

Huntington, H. P., M. Nelson, and L. T. Quakenbush. 2017c. Traditional knowledge regarding marine mammals near Scammon Bay, Alaska. Final Report (Contract M13PC00015) prepared by Huntington Consulting and the Alaska Department of Fish and Game to the Eskimo Walrus Commission, the Ice Seal Committee, and the Bureau of Ocean Energy Management.

Huntington, H. P., L. T. Quakenbush, and M. Nelson. 2017d. Evaluating the effects of climate change on indigenous marine mammal hunting in northern and western Alaska using traditional knowledge. *Frontiers in Marine Science* 4:319.

Intergovernmental Panel on Climate Change (IPCC). 2013. Climate change 2013: The physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. T. F. Stocker, D. Qin, G.-K. Plattner, M. M. B. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P. M. Midgley, editors. Cambridge University Press, New York. Accessed at: <https://www.ipcc.ch/report/ar5/wg1/>. (November 2019).

Intergovernmental Panel on Climate Change (IPCC). 2021. Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou, editors. Cambridge University Press, In Press.

Jay, C. V., R. L. Taylor, A. S. Fischbach, M. S. Udevitz, and W. S. Beatty. 2017. Walrus haul-out and in water activity levels relative to sea ice availability in the Chukchi Sea. *Journal of Mammalogy* 98(2):386-396.

Jensen, D., A. Mahoney, and L. Resler. 2020. The annual cycle of landfast ice in the eastern Bering Sea. *Cold Regions Science and Technology* 174:103059.

Johnson, M. L., C. H. Fiscus, B. T. Ostenson, and M. L. Barbour. 1966. Marine mammals. Pages 877-924 in N. J. Wilimovsky, and J. N. Wolfe, editors. *Environment of the Cape Thompson region, Alaska*. U.S. Atomic Energy Commission, Oak Ridge, Tennessee.

Jones, J. M., B. J. Thayre, E. H. Roth, M. Mahoney, I. Sia, K. Merculief, C. Jackson, C. Zeller, M. Clare, A. Bacon, S. Weaver, Z. Gentes, R. J. Small, I. Stirling, S. M. Wiggins, and J. A. Hildebrand. 2014. Ringed, bearded, and ribbon seal vocalizations north of Barrow, Alaska: Seasonal presence and relationship with sea ice. *Arctic* 67(2):203-222.

Kędra, M., C. Moritz, E. S. Choy, C. David, R. Degen, S. Duerksen, I. Ellingsen, B. Górska, J. M. Grebmeier, D. Kirievskaya, D. van Oevelen, K. Piwosz, A. Samuelsen, and J. M.

- Węsławski. 2015. Status and trends in the structure of Arctic benthic food webs. *Polar Research* 34(1):23775.
- Kelly, B. P. 1988. Bearded seal, *Erignathus barbatus*. Pages 77-94 in J. W. Lentfer, editor. Selected marine mammal species of Alaska: Species accounts with research and management recommendations. Marine Mammal Commission, Washington, D.C.
- Kenyon, K. W. 1962. Notes on phocid seals at Little Diomede Island, Alaska. *Journal of Wildlife Management* 26(4):380-387.
- Khon, V. C., I. I. Mokhov, M. Latif, V. A. Semenov, and W. Park. 2010. Perspectives of Northern Sea Route and Northwest Passage in the twenty-first century. *Climatic Change* 100(3-4):757-768.
- Khon, V. C., I. I. Mokhov, and V. A. Semenov. 2017. Transit navigation through northern sea route from satellite data and CMIP5 simulations. *Environmental Research Letters* 12(2).
- King, J. E. 1983. Seals of the world, 2nd edition. British Museum (Natural History) and Oxford University Press, London, United Kingdom.
- Kingsley, M. C. S., I. Stirling, and W. Calvert. 1985. The distribution and abundance of seals in the Canadian High Arctic, 1980-82. *Canadian Journal of Fisheries and Aquatic Sciences* 42(6):1189-1210.
- Konar, B., and A. M. Ravelo. 2013. Epibenthic community variability on the Alaskan Beaufort Sea continental shelf. Bureau of Ocean Energy Management, Alaska Outer Continental Shelf Region, Final Report, OCS Study BOEM 2013-01148, Anchorage.
- Kortsch, S., R. Primicerio, M. Fossheim, A. V. Dolgov, and M. Aschan. 2015. Climate change alters the structure of arctic marine food webs due to poleward shifts of boreal generalists. *Proceedings of the Royal Society B: Biological Sciences* 282(1814):31-39.
- Kosygin, G. M. 1966a. Distribution and some biological features of Bering Sea pinnipeds (spring-summer season 1963). *Izvestiya TINRO* 58:117-124. (Translated from Russian by F. H. Fay, 1993).
- Kosygin, G. M. 1966b. Distribution of bearded seals in the Bering Sea in the spring of 1962-1964. *Izvestiya TINRO* 58:125-128. (In Russian).
- Kosygin, G. M. 1971. Feeding of the bearded seal *Erignathus barbatus nauticus* (Pallas) in the Bering Sea during the spring-summer period. *Izvestiya TINRO* 75:144-151. (Translated from Russian in Translation Series Number 3747, 1976, Fisheries and Marine Service, Quebec, Canada, by the Department of the Secretary of State of Canada, Translation Bureau).

- Kovacs, K. M. 2002. Bearded seal *Erignathus barbatus*. Pages 84-87 in W. F. Perrin, B. Würsig, and J. G. M. Thewissen, editors. Encyclopedia of marine mammals, 1st edition. Academic Press, San Diego, California.
- Kovacs, K. M., B. A. Krafft, and C. Lydersen. 2019. Bearded seal (*Erignathus barbatus*) birth mass and pup growth in periods with contrasting ice conditions in Svalbard, Norway. Marine Mammal Science, Early View 2019:1-9.
- Kovacs, K. M., C. Lydersen, and I. Gjertz. 1996. Birth-site characteristics and prenatal molting in bearded seals (*Erignathus barbatus*). Journal of Mammalogy 77(4):1085-1091.
- Krafft, B. A., C. Lydersen, K. M. Kovacs, I. Gjertz, and T. Haug. 2000. Diving behaviour of lactating bearded seals (*Erignathus barbatus*) in the Svalbard area. Canadian Journal of Zoology 78(8):1408-1418.
- Krylov, V. I., G. A. Fedoseev, and A. P. Shustov. 1964. Pinnipeds of the far east. Pischedvaya Promyshlennost (Food Industry), Moscow, Russia. (Translated from Russian by F. H. Fay and B. A. Fay, University of Alaska Fairbanks).
- Lauth, R. R., E. J. Dawson, and J. Conner. 2019. Results of the 2017 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-396.
- Ling, J. K. 1970. Pelage and molting in wild animals with special reference to aquatic forms. Quarterly Review of Biology 45(1):16-54.
- Ling, J. K. 1972. Adaptive functions of vertebrate molting cycles. American Zoologist 12(1):77-93.
- Llobet, S. M., H. Ahonen, C. Lydersen, J. Berge, R. Ims, and K. M. Kovacs. 2021. Bearded seal (*Erignathus barbatus*) vocalizations across seasons and habitat types in Svalbard, Norway. Polar Biology 44(7):1273-1287.
- Logerwell, E., M. Busby, C. Carothers, S. Cotton, J. Duffy-Anderson, E. Farley, P. Goddard, R. Heintz, B. Holladay, J. Horne, S. Johnson, B. Lauth, L. Moulton, D. Neff, B. Norcross, S. Parker-Stetter, J. Seigle, and T. Sformo. 2015. Fish communities across a spectrum of habitats in the western Beaufort Sea and Chukchi Sea. Progress in Oceanography 136:115-132.
- Logerwell, E., K. Rand, and T. J. Weingartner. 2011. Oceanographic characteristics of the habitat of benthic fish and invertebrates in the Beaufort Sea. Polar Biology 34(11):1783-1796.
- Love, M. S., N. Elder, C. W. Mecklenburg, L. K. Thorsteinson, and T. A. Mecklenburg. 2016. Alaska Arctic marine fish species accounts. Pages 41-616 in L. K. Thorsteinson, and M.

S. Love, editors. Alaska Arctic marine fish ecology catalog. U.S. Geological Survey, Scientific Investigators Report 2016-5038 (OCS Study, BOEM 2016-048), Reston, Virginia.

Lowry, L. F., K. J. Frost, and J. J. Burns. 1979. Trophic relationships among ice inhabiting phocid seals and functionally related marine mammals: Final report of Beaufort Sea activities. Pages 573-629 in Environmental assessment of the Alaskan continental shelf, final reports of principal investigators, biological studies, volume 6. Outer Continental Shelf Environmental Assessment Program, National Oceanic and Atmospheric Administration, Environmental Research Laboratory, Boulder, Colorado.

Lowry, L. F., K. J. Frost, and J. J. Burns. 1980. Feeding of bearded seals in the Bering and Chukchi seas and trophic interaction with Pacific walruses. *Arctic* 33(2):330-342.

Lydersen, C., M. O. Hammill, and K. M. Kovacs. 1994. Diving activity in nursing bearded seal (*Erignathus barbatus*) pups. *Canadian Journal of Zoology* 72(1):96-103.

MacIntyre, K. Q., K. M. Stafford, C. L. Berchok, and P. L. Boveng. 2013. Year-round acoustic detection of bearded seals (*Erignathus barbatus*) in the Beaufort Sea relative to changing environmental conditions, 2008-2010. *Polar Biology* 36(8):1161-1173.

MacIntyre, K. Q., K. M. Stafford, P. B. Conn, K. L. Laidre, and P. L. Boveng. 2015. The relationship between sea ice concentration and the spatio-temporal distribution of vocalizing bearded seals (*Erignathus barbatus*) in the Bering, Chukchi, and Beaufort Seas from 2008 to 2011. *Progress in Oceanography* 136:241-249.

Mahoney, A., H. Eicken, A. G. Gaylord, and L. Shapiro. 2007. Alaska landfast sea ice: Links with bathymetry and atmospheric circulation. *Journal of Geophysical Research-Oceans* 112(C2).

Mahoney, A., H. Eicken, A. Graves, and L. Shapiro. 2005. Defining and locating the seaward landfast ice edge in northern Alaska. Pages 991-1001 in Proceedings of the 18th International Conference on Port and Ocean Engineering in Arctic Conditions, June 26-30, 2005, volume 3, Potsdam, New York. Accessed at: <https://www.poac.com/PapersOnline.html>.

Mahoney, A. R., H. Eicken, A. G. Gaylord, and R. Gens. 2014. Landfast sea ice extent in the Chukchi and Beaufort seas: The annual cycle and decadal variability. *Cold Regions Science and Technology* 103:41-56.

Mahoney, A. R., H. Eicken, L. H. Shapiro, R. Gens, T. Heinrichs, F. J. Meyer, and A. Graves. 2012. Mapping and characterization of recurring spring leads and landfast ice in the Beaufort and Chukchi seas. University of Alaska Fairbanks, Coastal Marine Institute, Final Report OCS Study BOEM 2012-067.

- Markus, T., J. C. Stroeve, and J. Miller. 2009. Recent changes in Arctic sea ice melt onset, freezeup, and melt season length. *Journal of Geophysical Research: Oceans* 114:C12024.
- McCormick-Ray, J., R. M. Warwick, and G. C. Ray. 2011. Benthic macrofaunal compositional variations in the northern Bering Sea. *Marine Biology* 158(6):1365-1376.
- McLaren, I. A. 1958. Some aspects of growth and reproduction of the bearded seal, *Erignathus barbatus* (Erxleben). *Journal of the Fisheries Research Board of Canada* 15(2):219-227.
- Mecklenburg, C. W., T. A. Mecklenburg, B. A. Sheiko, and D. Steinke. 2016. Pacific Arctic marine fishes. *Conservation of Arctic Flora and Fauna (CAFF)*, CAFF Monitoring Series Report 23, Akureyri, Iceland. Accessed at: <https://www.caff.is/marine/marine-monitoring-publications/370-pacific-arctic-marine-fishes>. (November 2019).
- Meier, W. N., G. K. Hovelsrud, B. E. H. van Oort, J. R. Key, K. M. Kovacs, C. Michel, C. Haas, M. A. Granskog, S. Gerland, D. K. Perovich, A. Makshtas, and J. D. Reist. 2014. Arctic sea ice in transformation: A review of recent observed changes and impacts on biology and human activity. *Reviews of Geophysics* 52(3):185-217.
- Melia, N., K. Haines, and E. Hawkins. 2016. Sea ice decline and 21st century trans-Arctic shipping routes. *Geophysical Research Letters* 43(18):9720-9728.
- Merkel, B., C. Lydersen, N. G. Yoccoz, and K. M. Kovacs. 2013. The world's northernmost harbour seal population-how many are there? *Plos One* 8(7):e67576.
- Moore, S. E., R. R. Reeves, B. L. Southall, T. J. Ragen, R. S. Suydam, and C. W. Clark. 2012. A new framework for assessing the effects of anthropogenic sound on marine mammals in a rapidly changing Arctic. *Bioscience* 62(3):289-295.
- Moulton, V. D., R. E. Elliott, T. L. McDonald, and W. J. Richardson. 2001. Chapter 5: Fixed-wing aerial surveys of seals near BP's Northstar and Liberty sites in 2000 (and 1997-2000 combined). Pages 5-1-5-66 in W. J. Richardson, and M. T. Williams, editors. *Monitoring of industrial sounds, seals, and whale calls during construction of BP's Northstar oil development, Alaskan Beaufort Sea, 2000*. LGL Report TA2428-3 prepared by LGL Environmental Research Associates and Greeneridge Sciences for BP Exploration (Alaska) and National Marine Fisheries Service.
- Moulton, V. D., R. E. Elliott, W. J. Richardson, and T. L. McDonald. 2002. Chapter 5: Fixed-wing aerial surveys of seals near BP's Northstar and Liberty sites in 2001 (and 1997-2001 combined). Pages 5-1-5-60 in W. J. Richardson, and M. T. Williams, editors. *Monitoring of industrial sounds, seals, and whale calls during construction of BP's Northstar oil development, Alaskan Beaufort Sea, 2001*. LGL Report TA2570-3 prepared by LGL Environmental Research Associates and Greenridge Sciences for BP Exploration (Alaska) and National Marine Fisheries Service.

- Moulton, V. D., R. E. Elliott, and M. T. Williams. 2003. Chapter 4: Fixed-wing aerial surveys near BP's Northstar and Liberty sites, 2002. Pages 4-1-4-35 in W. J. Richardson, and M. T. Williams, editors. Monitoring of industrial sounds, seals, and whale calls during construction of BP's Northstar oil development, Alaskan Beaufort Sea, 1999-2002. LGL Report TA2702-4 prepared by LGL Environmental Research Associates and Greenridge Sciences for BP Exploration (Alaska) and National Marine Fisheries Service.
- Moulton, V. D., T. L. McDonald, W. J. Richardson, R. E. Elliott, and M. T. Williams. 2000. Chapter 3: Fixed-wing aerial surveys of seals near BP's Northstar and Liberty sites in 1999 (and 1997-99 combined). Pages 3-1-3-71 in Monitoring of ringed seals during construction of ice roads for BP's Northstar oil development, Alaskan Beaufort Sea, 1999. LGL Report TA2349-3 prepared by LGL Environmental Research Associates and Greeneridge Sciences for BP Exploration (Alaska) and National Marine Fisheries Service.
- National Marine Fisheries Service. 2020. Draft RIR/ESA section 4(b)(2) preparatory assessment/IRFA of critical habitat designation for the Beringia distinct population segment (DPS) of the bearded seal. National Marine Fisheries Service, Alaska Region.
- National Research Council. 2014. Responding to oil spills in the U.S. Arctic marine environment. The National Academies Press, Washington, D.C. Accessed at: <https://www.mmc.gov/letters-and-reports/reports/project-and-workshop-reports/>. (November 2019).
- Nelson, R. K. 1981. Harvest of the sea: Coastal subsistence in modern Wainwright. A report for the North Slope Borough's coastal management program. North Slope Borough, Alaska.
- Nelson, R. R., J. J. Burns, and K. J. Frost. 1984. The bearded seal (*Ereignathus barbatus*). Pages 1-6 in J. J. Burns, editor. Marine mammals species accounts. Alaska Department of Fish and Game, Wildlife Technical Bulletin 7, Juneau.
- Norcross, B., B. Holladay, S. Apsens, L. Edenfield, B. Gray, and K. Walker. 2017a. Central Beaufort Sea marine fish monitoring. Final Report BOEM 2017-33. Accessed at: <https://www.boem.gov/newsroom/library/scientific-and-technical-publications-2017>. (June 2021).
- Norcross, B. L., S. J. Apsens, L. E. Bell, B. A. Bluhm, J. N. Dissen, L. E. Edenfield, A. Frothingham, B. P. Gray, S. M. Hardy, B. A. Holladay, R. R. Hopcroft, K. B. Iken, C. A. Smoot, K. L. Walker, and E. D. Wood. 2017b. US-Canada transboundary fish and lower trophic communities: Abundance, distribution, habitat and community analysis. Final Report BOEM 2017-34. Accessed at: <https://www.boem.gov/newsroom/library/scientific-and-technical-publications-2017>. (June 2021).

North Pacific Fishery Management Council. 2009. Fishery management plan for fish resources of the Arctic Management Area. North Pacific Fishery Management Council, Anchorage, Alaska. Accessed at: <https://www.fisheries.noaa.gov/action/amendment-2-fmp-fish-resources-arctic-management-area>. (December 2019).

Northwest Arctic Borough. 2016. Important areas for marine and coastal species. Pages 415-529 in Iñuuinaliqput Ililugu Nunanjuanun: documenting our way of life through maps. Northwest Arctic Borough, Kotzebue, Alaska. Accessed at: <https://www.nwabor.org/subsistence-mapping-program/digital-atlas/>. (December 2019).

Oceana, and Kauerak, Inc. 2014. Bering Strait marine life and subsistence use data synthesis. Accessed at: <https://oceana.org/publications/reports/the-bering-strait-marine-life-and-subsistence-data-synthesis>. (December 2019).

Office of Management and Budget. 2011. Regulatory impact analysis: Frequently asked questions (FAQs), February 7, 2011. Accessed at: https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/OMB/circulars/a004/a-4_FAQ.pdf. (November 2019).

Olnes, J., G. A. Breed, M. L. Druckenmiller, J. J. Citta, J. A. Crawford, A. L. Von Duyke, and L. Quakenbush. 2021. Juvenile bearded seal response to a decade of sea ice change in the Bering, Chukchi, and Beaufort seas. *Marine Ecology Progress Series* 661:229-242.

Olnes, J., J. Crawford, J. J. Citta, M. L. Druckenmiller, A. L. Von Duyke, and L. Quakenbush. 2020. Movement, diving, and haul-out behaviors of juvenile bearded seals in the Bering, Chukchi and Beaufort seas, 2014-2018. *Polar Biology* 43(9):1307-1320.

Parks, M., A. Ahmasuk, B. Compagnoni, A. Norris, and R. Rufe. 2019. Quantifying and mitigating three major vessel waste streams in the northern Bering Sea. *Marine Policy* 106:103530.

Perovich, D., W. Meier, M. Tschudi, S. Farrell, S. Hendricks, S. Gerland, C. Haas, T. Krumpen, C. Polashenski, R. Ricker, and M. Webster. 2019a. Sea ice cover [in "State of the Climate in 2018"]. *Bulletin of the Meteorological Society* 100(9):S146-S150.

Perovich, D., W. Meier, M. Tschudi, S. Hendricks, S. Gerland, L. Kaleschke, R. Ricker, X. Tien-Kunze, M. Webster, and K. Wood. 2019b. Sea ice. J. Richter-Menge, M. L. Druckenmiller, and M. Jeffries, editors. *Arctic report card: update for 2019*. Accessed at: <https://arctic.noaa.gov/Report-Card/Report-Card-2019>. (April 2020).

Popper, A. N., and A. D. Hawkins. 2019. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. *Journal of Fish Biology* 94(5):692-713.

Quakenbush, L. 2020a. Biological monitoring of ice seals in Alaska to determine health and status of populations—diet, disease, contaminants, reproduction, body condition, growth,

and age at maturity. Final Report, Project 04. Pages 169-449 + Appendices in L. Polasek, editor. Alaska pinniped research. Final Report, Award Number NA16NMF4390029, by Alaska Department of Fish and Game, Division of Wildlife Conservation, to National Marine Fisheries Service.

Quakenbush, L. 2020b. Movements and habitat use of Pacific Arctic seals and whales via satellite telemetry and ocean sensing. Final Report to Office of Naval Research, Award N00014-16-1-3019, Arlington, Virginia.

Quakenbush, L., J. Citta, and J. Crawford. 2011. Biology of the bearded seal (*Erignathus barbatus*) in Alaska, 1961-2009. Final Report prepared by the Alaska Department of Fish and Game to the National Marine Fisheries Service. Accessed at: <https://www.fisheries.noaa.gov/resource/document/biology-bearded-seal-erignathus-barbatus-alaska-1961-2009-2011>. (March 2020).

Quakenbush, L. T., J. A. Crawford, M. A. Nelson, and J. R. Olnes. 2019. Pinniped movements and foraging: Village-based satellite tracking and collection of traditional ecological knowledge regarding ringed and bearded seals. Bureau of Ocean Energy Management, Alaska Outer Continental Shelf Region, Final Report, OCS Study BOEM 2019-079, Anchorage, Alaska.

Rand, K. M., and E. A. Logerwell. 2011. The first demersal trawl survey of benthic fish and invertebrates in the Beaufort Sea since the late 1970s. *Polar Biology* 34(4):475-488.

Ravelo, A. M., B. Konar, and B. A. Bluhm. 2015. Spatial variability of epibenthic communities on the Alaska Beaufort Shelf. *Polar Biology* 38(11):1783-1804.

Ravelo, A. M., B. Konar, J. H. Trefry, and J. M. Grebmeier. 2014. Epibenthic community variability in the northeastern Chukchi Sea. *Deep-Sea Research Part II-Topical Studies in Oceanography* 102:119-131.

Ray, C., W. A. Watkins, and J. J. Burns. 1969. The underwater song of *Erignathus barbatus* (bearded seal). *Zoologica: Scientific Contributions of the New York Zoological Society* 54(2):79-83.

Renaud, P. E., M. K. Sejr, B. A. Bluhm, B. Sirenko, and I. H. Ellingsen. 2015. The future of Arctic benthos: expansion, invasion, and biodiversity. *Progress in Oceanography* 139:244-257.

Risch, D., C. W. Clark, P. J. Corkeron, A. Elepfandt, K. M. Kovacs, C. Lydersen, I. Stirling, and S. M. Van Parijs. 2007. Vocalizations of male bearded seals, *Erignathus barbatus*: Classification and geographical variation. *Animal Behaviour* 73:747-762.

Sigler, M. F., F. J. Mueter, B. A. Bluhm, M. S. Busby, E. D. Cokelet, S. L. Danielson, A. De Robertis, L. B. Eisner, E. V. Farley, K. Iken, K. J. Kuletz, R. R. Lauth, E. A. Logerwell,

- and A. I. Pinchuk. 2017. Late summer zoogeography of the northern Bering and Chukchi seas. Deep-Sea Research Part II: Topical Studies in Oceanography 135:168-189.
- Sills, J. M., C. Reichmuth, B. L. Southall, A. Whiting, and J. Goodwin. 2020a. Auditory biology of bearded seals (*Erignathus barbatus*). Polar Biology 43(11):1681-1691.
- Sills, J. M., B. Ruscher, R. Nichols, B. L. Southall, and C. Reichmuth. 2020b. Evaluating temporary threshold shift onset levels for impulsive noise in seals. Journal of the Acoustical Society of America 148(5):2973.
- Simpkins, M. A., L. M. Hiruki-Raring, G. Sheffield, J. M. Grebmeier, and J. L. Bengtson. 2003. Habitat selection by ice-associated pinnipeds near St. Lawrence Island, Alaska in March 2001. Polar Biology 26(9):577-586.
- Slabbekoorn, H., N. Bouton, I. van Opzeeland, A. Coers, C. ten Cate, and A. N. Popper. 2010. A noisy spring: The impact of globally rising underwater sound levels on fish. Trends in Ecology & Evolution 25(7):419-427.
- Slabbekoorn, H., J. Dalen, D. de Haan, H. V. Winter, C. Radford, M. A. Ainslie, K. D. Heaney, T. van Kooten, L. Thomas, and J. Harwood. 2019. Population-level consequences of seismic surveys on fishes: An interdisciplinary challenge. Fish and Fisheries 20(4):653-685.
- Smith, L. C., and S. R. Stephenson. 2013. New trans-Arctic shipping routes navigable by midcentury. Proceedings of the National Academy of Sciences 110(13):E1191-E1195.
- Smith, T. G. 1981. Notes on the bearded seal, *Erignathus barbatus*, in the Canadian Arctic. Canadian Technical Report of Fisheries and Aquatic Sciences 1042.
- Spies, I., K. M. Gruenthal, D. P. Drinan, A. B. Hollowed, D. E. Stevenson, C. M. Tarpey, and L. Hauser. 2020a. Genetic evidence of a northward range expansion in the eastern Bering Sea stock of Pacific cod. Evolutionary Applications 13(2):362-375.
- Spies, I., R. Haehn, E. Siddon, J. Conner, L. Britt, and J. Ianelli. 2020b. Assessment of the yellowfin sole stock in the Bering Sea and Aleutian Islands. Bering Sea and Aleutian Islands stock assessment and fishery evaluation reports. National Marine Fisheries Service, Alaska Fisheries Science Center, Seattle, Washington.
- Stabeno, P. J., and S. W. Bell. 2019. Extreme conditions in the Bering Sea (2017-2018): Record-breaking low sea ice extent. Geophysical Research Letters 46(15):8952-8959.
- Stabeno, P. J., E. V. Farley, N. B. Kachel, S. Moore, C. W. Mordy, J. M. Napp, J. E. Overland, A. I. Pinchuk, and M. F. Sigler. 2012. A comparison of the physics of the northern and southern shelves of the eastern Bering Sea and some implications for the ecosystem. Deep-Sea Research Part II: Topical Studies in Oceanography 65-70:14-30.

- Stammerjohn, S., R. Massom, D. Rind, and D. Martinson. 2012. Regions of rapid sea ice change: An inter-hemispheric seasonal comparison. *Geophysical Research Letters* 39:L06501.
- Stephenson, S. R., L. C. Smith, L. W. Brigham, and J. A. Agnew. 2013. Projected 21st-century changes to Arctic marine access. *Climatic Change* 118:885-899.
- Stevenson, D. E., and R. R. Lauth. 2012. Latitudinal trends and temporal shifts in the catch composition of bottom trawls conducted on the eastern Bering Sea shelf. *Deep-Sea Research Part II: Topical Studies in Oceanography* 65-70:251-259.
- Stevenson, D. E., and R. R. Lauth. 2019. Bottom trawl surveys in the northern Bering Sea indicate recent shifts in the distribution of marine species. *Polar Biology* 42(2):407-421.
- Stringer, W. J. 1978. Morphology of Beaufort, Chukchi and Bering seas near shore ice conditions by means of satellite and aerial remote sensing. Pages 1-220 in Environmental assessment of the Alaskan continental shelf. Annual reports of principal investigators for the year ending March 1978, volume 10.
- Stroeve, J., and D. Notz. 2018. Changing state of Arctic sea ice across all seasons. *Environmental Research Letters* 13(10).
- Thometz, N. M., H. Hermann-Sorensen, B. Russell, D. A. S. Rosen, and C. Reichmuth. 2021. Molting strategies of Arctic seals drive annual patterns in metabolism. *Conservation Physiology* 9(1):coaa112.
- Thorson, J. T., M. Fossheim, F. J. Mueter, E. Olsen, R. R. Lauth, R. Primicerio, B. Husson, J. Marsh, A. Dolgov, and S. G. Zador. 2019. Comparison of near-bottom fish densities show rapid community and population shifts in Bering and Barents seas. J. Richter-Menge, M. L. Druckenmiller, and M. Jeffries, editors. Arctic report card: update for 2019. Accessed at: <https://arctic.noaa.gov/Report-Card/Report-Card-2019>. (April 2020).
- Tikhomirov, E. A. 1964. Distribution and biology of pinnipeds in the Bering Sea (from materials of the First Expedition in 1962). Pages 277-285 in P. A. Moiseev, editor. Soviet fisheries investigations in the northeast Pacific, part III. Pishevaya Promyshlennost (Food Industry), Moscow, Russia. (Translated from Russian by Israel Program for Science Translations, Jerusalem).
- Tikhomirov, E. A. 1966. Reproduction of seals of the family Phocidae in the North Pacific. *Zoologicheskii Zhurnal* 45(2):275-281. (Translated from Russian in Translation Series 1889, 1971, Fisheries Board of Canada, Sainte-Anne-de-Bellevue, Quebec, by Department of the Secretary of State of Canada, Translation Bureau).
- Trukhanova, I. S., P. B. Conn, and P. L. Boveng. 2018. Taxonomy-based hierarchical analysis of natural mortality: polar and subpolar phocid seals. *Ecology and Evolution* 8(21):10530-10541.

- U.S. Arctic Research Commission (USARC). 2012. Oil spills in Arctic waters: An introduction and inventory of research activities and USARC recommendations. U.S. Arctic Research Commission, Arlington, Virginia, and U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire. Accessed at: https://www.arctic.gov/publications/white%20papers/oil_spills_2012.html. (March 2014).
- U.S. Committee on the Marine Transportation System. 2019. A ten-year projection of maritime activity in the U.S. Arctic region, 2020-2030. U.S. Committee on the Marine Transportation System, Washington, D.C. Accessed at: https://www.cmts.gov/downloads/CMTS_2019_Arctic_Vessel_Projection_Report.pdf. (December 2019).
- U.S. Global Climate Change Research Program (USGCRP). 2017. Climate science special report: Fourth national climate assessment, volume I. D. J. Wuebbles, D. W. Fahey, K. A. Hibbard, D. J. Dokken, B. C. Stewart, and T. K. Maycock, editors. U.S. Global Climate Change Research Program, Washington, D.C. Accessed at: <https://www.globalchange.gov/browse/reports/climate-science-special-report-fourth-national-climate-assessment-nca4-volume-i>. (June 2019).
- Van Parijs, S. M. 2003. Aquatic mating in pinnipeds: A review. *Aquatic Mammals* 29(2):214-226.
- Van Parijs, S. M., and C. W. Clark. 2006. Long-term mating tactics in an aquatic-mating pinniped, the bearded seal, *Erignathus barbatus*. *Animal Behaviour* 72(6):1269-1277.
- Van Parijs, S. M., C. Lydersen, and K. M. Kovacs. 2003. Vocalizations and movements suggest alternative mating tactics in male bearded seals. *Animal Behaviour* 65:273-283.
- Van Parijs, S. M., C. Lydersen, and K. M. Kovacs. 2004. Effects of ice cover on the behavioural patterns of aquatic-mating male bearded seals. *Animal Behaviour* 68:89-96.
- Vate Brattström, L., J. A. Mocklin, J. L. Crance, and N. A. Friday, editors. 2019. Arctic whale ecology study (ARCWEST): Use of the Chukchi Sea by endangered baleen and other whales (westward extension of the BOWFEST). Final Report of the Arctic Whale Ecology Study (ARCWEST), OCS Study BOEM 2018-022. National Marine Fisheries Service, Alaska Fisheries Science Center, Marine Mammal Laboratory, Seattle, Washington.
- Ver Hoef, J. M., M. F. Cameron, P. L. Boveng, J. M. London, and E. E. Moreland. 2014. A spatial hierarchical model for abundance of three ice-associated seal species in the eastern Bering Sea. *Statistical Methodology* 17:46-66.

Ver Hoef, J. M., M. F. Cameron, P. L. Boveng, J. M. London, and E. M. Moreland. In review. A hierarchical model for abundance of three ice-associated seal species in the Eastern Bering Sea.

Watanabe, Y., C. Lydersen, K. Sato, Y. Naito, N. Miyazaki, and K. M. Kovacs. 2009. Diving behavior and swimming style of nursing bearded seal pups. *Marine Ecology Progress Series* 380:287-294.

Wilkinson, J., C. J. Beegle-Krause, K. U. Evers, N. Hughes, A. Lewis, M. Reed, and P. Wadhams. 2017. Oil spill response capabilities and technologies for ice-covered Arctic marine waters: A review of recent developments and established practices. *Ambio* 46:423-441.

Wilson, S. C., I. Trukhanov, L. Dmitriev, E. Dolgov, I. Crawford, M. Baimukanov, T. Baimukanov, B. Ismagambetov, M. Pazylbekov, M. Jussi, and S. J. Goodman. 2017. Assessment of impacts and potential mitigation for icebreaking vessels transiting pupping areas of an ice-breeding seal. *Biological Conservation* 214:213-222.

Yochim, P. K., and B. S. Stewart. 2002. Hair and fur. Pages 548-549 in W. F. Perrin, B. Würsig, and J. G. M. Thewissen, editors. *Encyclopedia of marine mammals*, 1st edition. Academic Press, San Diego, California.

Young, B. G., L. L. Loseto, and S. H. Ferguson. 2010. Diet differences among age classes of Arctic seals: Evidence from stable isotope and mercury biomarkers. *Polar Biology* 33(2):153-162.