

## 10 Key Reasons to Protect the Northern Bering Sea and Bering Strait

### 1. Culture, Food Security, Economy

The cold, rich waters of the northern Bering Sea and Bering Strait form the foundation of culture, food security, and economy for Central Yup'ik, Cup'ik, St. Lawrence Island Yupik and Inupiaq peoples. Indigenous peoples have relied on the abundant marine resources of this region for thousands of years.

### 2. Way of Life

Cultural practices associated with hunting and fishing bind people to the sea, and tie families and communities together through the sharing of food and passing of knowledge from one generation to the next.

### 3. Migration and the Rhythm of Sea Ice

The northern Bering Sea and Bering Strait ecosystem is driven by the annual cycle of seasonal sea ice that forms in the fall and retreats in the spring.<sup>1</sup> One of the Earth's largest migrations of marine mammals and birds moves to and from the Arctic Ocean through the funnel of the narrow Bering Strait.<sup>2</sup>

In winter the waters between St. Lawrence and St. Matthew islands contain a combination of pack ice, polynyas (persistent open water areas within the pack ice), and broken ice floes. This dynamic zone is seasonal habitat for bowhead and beluga whales. Walrus and bearded seals use the ice surface as a platform for resting, breeding, or feeding. The entire global population of spectacled eiders winters over here in stunningly dense aggregations. Spotted seals occupy the ice edge and ringed seals concentrate in coastal ice where they build lairs for raising pups.

In spring, the melting of winter sea ice, combined with nutrient rich waters transported by currents to the continental shelf and the return of sunlight, stimulates a massive phyto- and zooplankton "bloom" that fuels the whole food web and sustains a rich living seafloor.<sup>3</sup> Traveling with the retreating ice, herds of Pacific walrus move north to the Chukchi Sea. Bowhead whales follow ice leads to the Beaufort Sea, beluga whales follow schools of fish into coastal waters, and gray whales arrive from the south. Seals make their way inshore or northward to the Arctic Ocean. Spectacled eiders are joined by millions of birds flying to nesting grounds on coastal cliffs and wetlands.

In the St. Lawrence Island Yupik language, the migration phenomenon is called *katawhsaqa* or "pouring out" because of the profusion and movement of marine life.<sup>4</sup> During this time and throughout the summer, families focus on traditional hunting, fishing, and gathering.

### 4. Underwater Soundscape

Year-round, the northern Bering Sea is a sensitive acoustic environment. Marine mammals use sound to locate food and to navigate. Songs and calls are important for communication and mating, and the animals listen for predator cues within the ambient ocean soundscape.<sup>5</sup>

### 5. Traditional Ecological Knowledge

Traditional knowledge and expertise needed for hunting, fishing, gathering, and the preservation of food is passed down through generations based on experience and observation. It has enabled survival, shaped culture, and is also useful to scientific research and in the ability of tribes to adapt to the future.

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## 6. Variability

Successful harvest requires use of large areas of the ocean to account for year-to-year variability in ocean and ice conditions and the movement of species.<sup>6</sup> In some years, walrus hunters on St. Lawrence Island travel in small boats up to 100 miles offshore.<sup>7</sup>

## 7. Small-Scale Local Fisheries

Communities along the northern Bering Sea coast engage in small-scale commercial fisheries for salmon, crab, herring, and halibut. Harvesting and processing of local seafood provides jobs and opportunity that supports families in the mixed subsistence and cash economy.

## 8. Front Edge of Climate Change

The northern Bering Sea and Bering Strait region is vulnerable to ecological transformation and uncertainty due to warming ocean conditions. Satellite and local observations show that the timing, duration, and extent of seasonal sea ice are changing, generating a suite of ecological shifts:

- Biological communities on the seafloor have declined over the past few decades, changing the location and abundance of prey for marine mammals and birds.<sup>8</sup>
- During a series of especially warm years, a wide range of fish species moved north.<sup>9</sup>
- Late ice formation exposes villages to storm surges, resulting in dangerous coastal erosion that may force relocation.<sup>10</sup>
- In some recent years, the retreating ice has drifted north so fast that walrus hunters have been completely unsuccessful.<sup>11</sup>
- Local hunters report that sea ice has been thinner, making traveling on the ice more dangerous.<sup>12</sup>

## 9. Uncertainty

Climate models indicate that winter sea ice will continue to form in the northern Bering Sea for the time being, but scientists forecast more variability and less predictability in its timing, duration and extent.<sup>13</sup> A warming climate trajectory presents an uncertain future for the ecosystem and coastal communities culturally connected to healthy, available, and abundant marine resources.<sup>14</sup>

## 10. Shared Vision

Coastal tribes share a vision for the northern Bering Sea and Bering Strait guided by the right of Yupik and Inupiaq peoples to hunt and fish in traditional territory, the enduring cultural practices such as passing on traditional knowledge to the next generation, the importance of safeguarding ocean resources that provide for the way of life, and the need for self-determination in the management of resources and habitat.<sup>15</sup>

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<sup>1</sup> Grebmeier, J.M. 2012. Shifting patterns of life in the Pacific Arctic and sub-arctic seas. *Annual Review of Marine Science*, 4(1):63-78. doi:10.1146/annurev-marine-120710-100926

<sup>2</sup> Grebmeier, J.M., Cooper, L.W., Ashjian, C.A., Bluhm, B.A., Campbell, R.B., Dunton, K.E., Moore, J., Okkonen, S., Sheffield, G., Trefry, J. and Pasternak, S.Y. 2015. Pacific Marine Arctic Regional Synthesis (PacMARS) Final Report, North Pacific Research Board. Available at <http://pacmars.cbl.umces.edu/>

<sup>3</sup> Grebmeier, J.M., Cooper, L.W., Feder, H.M. and Sirenko, B.I. 2006. Ecosystem dynamics of the Pacific-influenced Northern Bering and Chukchi Seas in the Amerasian Arctic. *Progress in Oceanography*, 71:331-361. doi.org/10.1016/j.pocean.2006.10.001

<sup>4</sup> Oozeva, C., Noongwook, C., Noongwook, G., Alowa, C. and Krupnik, I. 2004. *Watching Ice and Weather Our Way*. Edited by Krupnik, I., Huntington, H., Koonooka, C. and Noongwook, G. Arctic Studies Center, Smithsonian Institute, Washington, DC.

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- <sup>5</sup> Stafford, K. 2013. Anthropogenic Sound and Marine Mammals in the Arctic. Prepared for The Pew Charitable Trusts' U.S. Arctic Program. Available at <http://www.pewtrusts.org/en/projects/protecting-life-in-the-arctic/arctic-science/arctic-science-initiatives/anthropogenic-sound-and-marine-mammals-in-the-arctic>
- <sup>6</sup> Huntington, H., Ortiz, I., Noongwook, G., Fidel, M., Childers, D., Morse, M., Beaty, J., Alessa, L. and Kliskey, A. 2013. Mapping human interaction with the Bering Sea ecosystem: Comparing seasonal use areas, lifetime use areas, and "calorie-sheds." *Deep Sea Research Part II: Topical Studies in Oceanography*, 94:292-300. <http://dx.doi.org/10.1016/j.dsr2.2013.03.015>
- <sup>7</sup> Kawerak, Inc. and Oceana. 2014. Bering Strait Marine Life and Subsistence Use Data Synthesis. Available at <http://oceana.org/publications/reports/the-bering-strait-marine-life-and-subsistence-data-synthesis>
- <sup>8</sup> Grebmeier, J.M., Moore, S.E., Overland, J.E., Frey, K.E. and Gradinger, R. 2010. Biological response to recent Pacific Arctic sea ice retreats. *Eos, Transactions American Geophysical Union*, 91(18):161-162. doi:10.1029/2010EO180001
- <sup>9</sup> Mueter, F.J. and Litzow, M.A. 2008. Sea ice retreat alters the biogeography of the Bering Sea continental shelf. *Ecological Applications*, 18:309–320. doi.org/10.1890/07-0564.1
- <sup>10</sup> Markon, C.J., Trainor, S.F., and Chapin, F.S., III, eds. 2012. The United States National Climate Assessment— Alaska Technical Regional Report: U.S. Geological Survey Circular 1379.
- <sup>11</sup> Caldwell, S. July 8, 2015. Alaska village ponders next steps as walrus harvests decline drastically. *Alaska Dispatch News*. Available at <http://www.adn.com/article/20150708/alaska-village-ponders-next-steps-walrus-harvests-decline-dramatically>
- <sup>12</sup> Kawerak, Inc. and Oceana. 2014. Bering Strait Marine Life and Subsistence Use Data Synthesis. Available at <http://oceana.org/publications/reports/the-bering-strait-marine-life-and-subsistence-data-synthesis>
- <sup>13</sup> Stroeve, J.C., Serreze, M.C., Holland, M.M., Kay, J.E., Malanik, J. and Barrett, A.P. 2012. The Arctic's rapidly shrinking sea ice cover: a research synthesis. *Climatic Change*, 110(3):1005-1027. doi:10.1007/s10584-011-0101-1
- <sup>14</sup> Meier, W.N., et al. 2014. Arctic sea ice in transformation: A review of recent observed changes and impacts on biology and human activity. *Reviews of Geophysics*, 52:185–217. doi:10.1002/2013RG000431
- <sup>15</sup> See resolutions adopted in 2016 by Association of Village Council Presidents, Bering Sea Elders Group, and Kawerak, Inc.