Alaska

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Key Message 29.1

Our Health and Healthcare Are at Risk

Health disparities in Alaska, including access to healthcare and health outcomes, are exacerbated by climate change (*high confidence*). The well-being of Alaska residents will be further challenged by climate-driven threats and by emerging diseases (*medium confidence*). Improving health surveillance and healthcare access statewide can increase resilience to events that threaten public health (*medium confidence*).

Key Message 29.2

Our Communities Are Navigating Compounding Stressors

Climate change amplifies the social and economic challenges facing Alaska communities (*high confidence*). Resource shifts, coastal and riverbank erosion, and disproportionate access to services will continue to threaten the physical and social integrity of these communities *(high confidence*). Increased adaptation capacity and equitable support have the potential to help rural and urban communities address Alaska's regionally varied climate-driven threats (*high confidence*).

Key Message 29.3

Our Livelihoods Are Vulnerable Without Diversification

Livelihoods, especially those dependent on natural resources, are at risk around Alaska. While advancing climate change has contributed to the collapse of major fisheries and is undermining many existing jobs and ways of life (*high confidence*), it may also create some opportunities related to adaptation and response (*medium confidence*). Economic diversification, especially expansion of value-added industries, can help increase overall livelihood options (*medium confidence*).

Key Message 29.4

Our Built Environment Will Become More Costly

Much of Alaska's infrastructure was built for a stable climate, and changes in permafrost, ocean conditions, sea ice, air temperature, and precipitation patterns place that infrastructure at risk (*high confidence*). Further warming is expected to lead to greater needs and costs for maintenance or replacement of buildings, roads, airports, and other facilities *(high confidence*). Planning for further change and greater attention to climate trends and changes in extremes can help improve infrastructure resilience around Alaska (*high confidence*).

Key Message 29.5

Our Natural Environment Is Transforming Rapidly

Alaska's ecosystems are changing rapidly due to climate change (*high confidence*). Many of the ecosystem goods and services that Alaskans rely on are expected to be diminished by further change (*medium confidence*). Careful management of Alaska's natural resources to avoid additional stresses on fish, wildlife, and habitats can help avoid compounding effects on our ecosystems (*medium confidence*).

Key Message 29.6

Our Security Faces Greater Threats

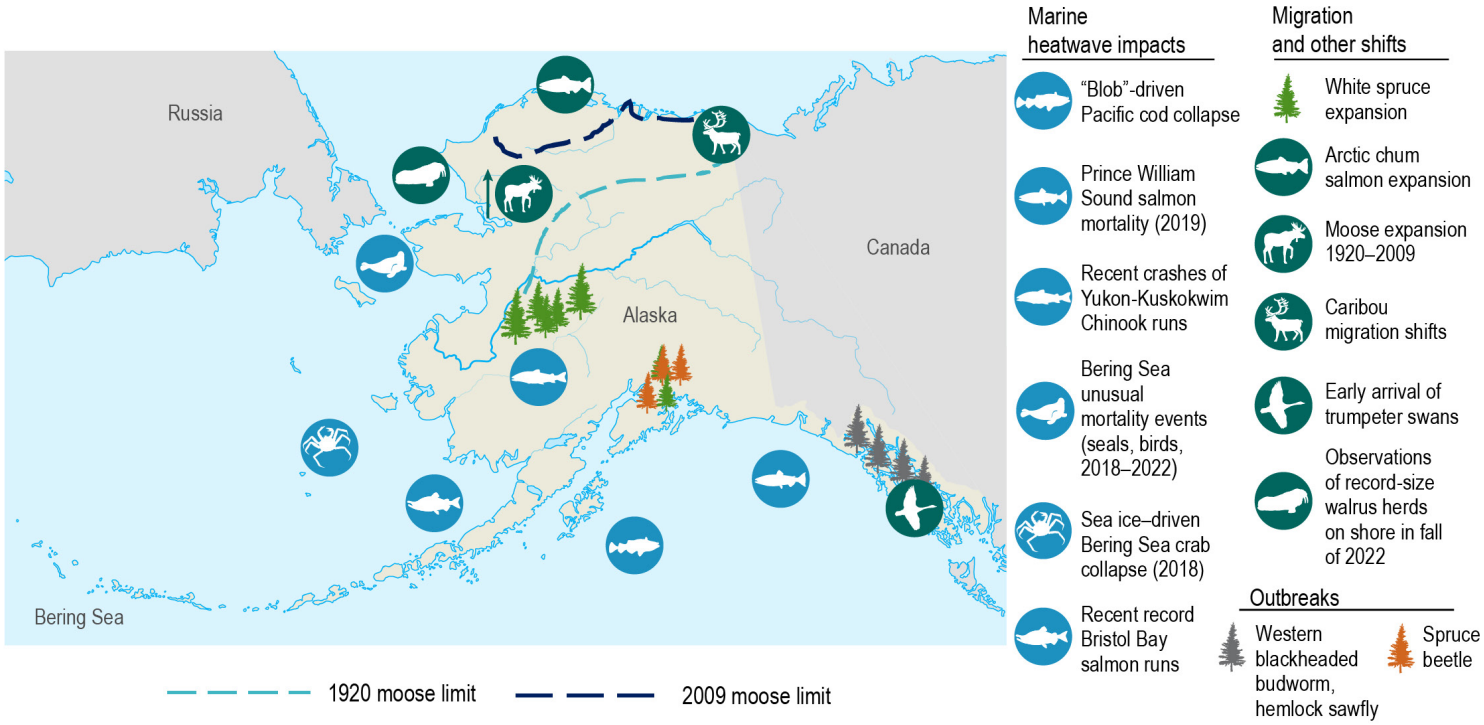
Rapid climate-driven change in Alaska undermines many of the assumptions of predictability on which community, state, and national security are based (*high confidence*). Further change, especially in the marine environment with loss of sea ice, will create new vulnerabilities and requirements for security from multiple perspectives and at multiple scales (*high confidence*). Greater capacity for identifying and responding to threats has the potential to help reduce security risks in the Alaska region (*medium confidence*).

Key Message 29.7

Our Just and Prosperous Future Starts with Adaptation

Local and regional efforts are underway around Alaska to prepare for and adapt to a changing climate (*high confidence*). The breadth of adaptation needed around the state will require substantial investment of financial resources and close coordination among agencies, including Tribal governments (*high confidence*). The effectiveness of adaptation planning and activities can be strengthened by addressing intersecting non-climate stressors, prioritizing the needs of the communities and populations experiencing the greatest impacts, building local capacity, and connecting adaptation efforts to economic and workforce development (*medium confidence*).

Major Recent Ecological Changes



Climate change has caused or contributed to extensive ecological effects throughout Alaska in recent years.

Figure 29.11. Warming ocean waters, extreme heat events, and other changes, including the events shown in Figure 29.1, are affecting ecosystems across Alaska. Some species' ranges are expanding, including chum salmon in Arctic rivers (Dunmall et al. 2022), moose (Tape et al. 2016) and beaver (Tape et al. 2018) in the Arctic (not shown), and white spruce in western Alaska (KM 8.2; Juday et al. 2015). Migration timings or patterns are changing, for example trumpeter swans in Southeast Alaska (Cohen 2019) and caribou in the eastern Arctic. Marine heatwaves and reduced sea ice cover are affecting seabird, fish, and seal populations: the North Pacific "Blob" (Figure 29.1) contributed to Pacific cod collapse, the 2019 Southcentral heatwave affected Prince William Sound king salmon survival (von Biela et al. 2020), and low sea ice caused or contributed to the collapse of crab fisheries and unusual mortality events for seabirds and ice seals in the Bering Sea region (2018–2022; KM 10.2; Figure 10.1). In 2022, Pacific walrus hauled out in record numbers in the Bering Strait area (Fischbach and Douglas 2022), suggesting that the minimum population estimate may be higher than previously thought, even if the range may be shrinking. Insect distributions and outbreaks have also changed (Ahtuangaruak 2019; White 2019). In Southeast Alaska, outbreaks of western blackheaded budworm and hemlock sawfly have damaged forests in the wake of the 2017–2019 drought (USFS 2020). The 2019 heatwave in Southcentral Alaska contributed to spruce beetle expansion in that region and extreme fire activity on the Kenai peninsula (KM 7.1; Box 7.1). Salmon runs responded variably: Yukon–Kuskokwim River king salmon runs have been decimated (von Biela et al. 2020), while Bristol Bay has had record sockeye salmon returns. Figure credit: USGS, NOAA Fisheries, and Ocean Conservancy. See full chapter for detailed citations.

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