

Community Spotlight:

HOMER AND NAPAKIAK, ALASKA

An aerial view of the Kuskokwim River, just up from Bethel, Alaska.

Credit: P.A. Lawrence, LLC. / Alamy Stock Photo

Alaskan Communities Adapt to Dramatic Climate Change

Each spring and fall, Napakiak City Council member and Alaska Native Walter Nelson watches the Kuskokwim River move closer to his town. A warming climate has altered the flow of Alaskan rivers, as ice melt speeds up and they are not frozen as long as they once were. Violent storms, also fueled by a warming climate, add to the changing characteristics of the Kuskokwim River as it flows by the tiny Alaskan village of Napakiak before emptying into the Bering Sea. Every year, a rising torrent chews out bigger swaths of riverbank, encroaching upon this small community of about 360 people, mostly of Inuit descent, driving the town into what experts call a “managed retreat.”

In 2019, strong spring storms took out the town boat landing, threatening the only school in town and forcing the community to move its city garage and fire station further away from the river. The town cemetery has already been flooded and relocated, Nelson says, and residents are now investing in metal caskets so they can be moved more easily in the future.

FACT BOX

Overview: Alaska is facing some of the most imminent threats from climate change in the United States, with fast-rising temperatures, thawing permafrost and massive storms. The small Inuit village of Napakiak is under immediate threat of flooding from the rising Kuskokwim River, and community leaders are consulting with engineers and scientists to determine how and where to move. Homer, a fishing and tourist center of more than 5,000, adopted one of the state’s first climate action plans and is continuing to try to adapt to a world with more dangerous storms and threatened fisheries.

Location: Homer and Napakiak, Alaska

Community characteristics: Small town and Inuit village

Goals: Reduce erosion, impacts from flooding and climate threats

Response: Develop managed retreat and climate mitigation and adaptation plans

Project status: Ongoing

Key stakeholders: Alaska Native Tribal Health Consortium, City of Homer, Denali Commission, Kachemak Coastal Estuarine Reserve, Napakiak City Council, Summit Consulting Services

Key resources: Alaska Native Tribal Health Consortium, Homer Climate Action Plan, Kachemak Coastal Estuarine Reserve

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Located near Bethel in the western part of the state, Napakiak is one of hundreds of Alaskan Indigenous communities battling increasingly severe climate and weather conditions due to climate change. A 2009 U.S. [Government Accountability Office report](#)¹ estimated that more than 30 communities were facing “imminent threat” from flooding and erosion, and that number is growing as the climate warms. The Fourth National Climate Assessment’s [chapter on Alaska](#)² warned that the effects of a changing climate will be particularly hard on Indigenous communities.

“The impacts of climate change will likely affect all aspects of Alaska Native societies, from nutrition, infrastructure, economics, and health consequences to language, education, and the communities themselves,” the federal report states.

But Napakiak is not sitting still. Its leaders are working with scientists and federal, state and Indigenous support groups to come up with plans to save the community. In the spring of 2019, an Alaska-based construction management and engineering firm, Summit Consulting Services, started working to rebuild the boat launch and barge landing in Napakiak, which are essential to the movement of freight and transportation. The company is also helping plan the town’s managed retreat from the river. Their geotechnical investigation includes surveys to determine soil conditions in different locations. Based on the findings, the community will be able to make more informed decisions about its options for the future, says Summit president David Cramer.

The challenges for Napakiak as well as many other communities in the Yukon Delta are hard to fathom, Cramer says, as erosion, permafrost thawing, sea level rise and inland river flooding are increasing threats to towns in the area. “We are seeing changes faster than anyone expected, and it’s accelerating in ways no one projected... The consequences are huge. The whole region could be totally reconfigured by 2100.”



Yukon Kuskokwim Delta National Wildlife Refuge in Alaska.

Credit: P.A. Lawrence, LLC. / Alamy Stock Photo

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¹ U.S. Government Accountability Office (2009). Alaska Native Villages: Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion. GAO-09-551. <https://www.gao.gov/products/GAO-09-551>.

² Markon, C. et al. (2018). Alaska. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R. et al. (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 1185–1241. doi:10.7930/NCA4.2018.CH26. <https://nca2018.globalchange.gov/chapter/26/>.

Cramer says that after years of planning, his construction company has the expertise to help address these challenges, although it would require a serious investment of money. Cramer says Summit's initial contract is for about \$1 million, provided mainly through funding from the Denali Commission, an independent federal agency that provides economic support to rural Alaska. Unfortunately, the cost of moving the entire community of Napakiak to safer ground will cost perhaps 10-20 times that, he says. Where that money will come from is hard to know, especially in a state where oil revenues are declining and budgets are being squeezed.

Climate-related impacts in towns like Napakiak are becoming more dire with each passing storm, and local leaders know they can't wait for political winds to shift in their favor. Whether towns are on the coast or further inland, a warming climate presents growing threats to communities across the state. A [2018 report](#)³ from the Alaska Native Tribal Health Consortium, a nonprofit organization that works with tribal populations across the state, described the community's situation in blunt terms, calling for immediate action (see sidebar).

Napakiak community leaders like Walter Nelson have reached out to government and nonprofit organizations ranging from the U.S. Army Corps of Engineers to the Alaska Native Tribal Health Consortium, searching for help to deal with increasing threats to their way of life. In April 2019, Walter traveled to Wisconsin to attend the National Adaptation Forum, a national conference of professional and public climate adaptation experts, where he presented his community's story and search for a solution.

"We have seen from our own past experience that relying on other funding sources can be challenging, but we have been able to apply and have received limited funding for relocating buildings," Nelson said. "We are still facing upcoming, different challenges for our community without having a formal climate adaptation plan in place."

Nelson says the conference was an eye-opening experience for him, learning from community leaders around the country who are already working on a myriad of climate issues and plans. After listening to climate experts and talking to other community leaders, Nelson says it made him realize the massive challenges that lie ahead and become even more worried about his community's future. "We are so far remote and we haven't been paying attention to this problem...we are just beginning to wake up."

David Andrew, the tribal administrator for Napakiak, attended the adaptation forum as well. He has helped the community buy special trailers to move houses away from the river, including his mother's home. But he says at some point the town will have to move to safer ground, where the river and the thawing permafrost won't continue to threaten their homes. "People have lived in the area since the beginning of time," Andrew says. "The village used to be in a forest where we used to go hunting. Now the ice has thawed and we see dead salmon floating on the water because of the heat...it's scary to see."

Alaska Native Tribal Health Consortium "Erosion in Napakiak" 2018 report

"The magnitude and rapidity of erosion in Napakiak require immediate action and long-term planning. Studies done to-date have concluded that entire community of Napakiak will need to relocate to another site. Napakiak's immediate priority is to relocate and replace threatened infrastructure, and begin collecting data that will inform long-term planning. In some areas, the observed rate of erosion has been significantly faster than 25-50 ft. estimated by the US Army Corps of Engineers in 2009. According to the 2018 Napakiak Hazard Mitigation Plan, the community has lost up to 75 ft. of shoreline in one year...

It is likely that changes associated with a warming climate will cause erosion to accelerate. Examples of factors that may contribute to increased erosion include: the average annual temperature in Western Alaska is predicted to increase 7-13°F by 2100; heavy precipitation events are expected to increase, sea level is expected to rise, and permafrost is expected to degrade, etc. To best adapt to future conditions, Napakiak is seeking funding to conduct a climate risk assessment to estimate the future rate and extent of erosion."

³ Neale, Max (2018). Alaska Native Tribal Health Consortium. Erosion in Napakiak, Alaska: May 10-11, 2018 Trip Report. <https://www.commerce.alaska.gov/web/Portals/4/pub/RA/Max%20Neale%20Napakiak%20Trip%20Report.pdf>.

As Alaska's rural villages deal with increasingly dire impacts of a warming world, other cities and towns in Alaska have been preparing for climate change, too. Some already have specific plans in place. One of the first cities to tackle its changing climate was Homer, a fishing and tourist center of about 5,000 residents on the Kenai Peninsula by the Kachemak Bay. Homer created a [climate action plan](#)⁴ after former mayor James Hornaday attended a national climate conference in 2006. Hornaday formed a global warming task force and got support from the city council for the plan. It includes energy management and efficiency programs, as well as public transportation, waste reduction and land use measures to cut greenhouse gas emissions in the town.

Finalized in 2007, Homer's climate plan was seen as visionary and forward-thinking: "If Homer's Climate Action Plan is used as intended, the community will see immediate local benefits and perhaps make a contribution to the global effort to combat climate change far beyond what most small towns have achieved," the climate report said.

But more than 10 years later, there is still much more work to do, especially in the area of adaptation. Increasing storms and coastal erosion are growing concerns for a town that lies near a spit of commercial land that juts out into the bay. A [study published](#)⁵ by the University of Alberta examined Homer's climate plan in detail, stating that "...while Homer is experiencing a variety of climate change impacts, adaptation remains a low priority for city officials."

Some local officials are trying to change that. Donna Aderhold, a Homer city council member and wildlife biologist, is concerned about the low areas of town along the spit of land by the bay that includes many of the town's businesses. Although she is actively working on ways to increase local revenue for climate mitigation programs, she is aware that action is needed to address the effects of climate change already underway.

"From an adaptation standpoint, the Homer spit is highly vulnerable to storm surges and the city is currently in the early stages of working with the Alaska Department of Transportation and Public Facilities and the U.S. Army Corps of Engineers on erosion mitigation," Aderhold wrote in an email. "One thing leads to another and this



Halibut Cove across Kachemak Bay from Homer, Alaska.

Credit: Shutterstock.com

⁴ City of Homer, Alaska (December 2007). Climate Action Plan: Reducing the Threat of Global Climate Change Through Government and Community Efforts. https://www.cityofhomer-ak.gov/sites/default/files/fileattachments/city_council/page/6722/climate_action_plan.pdf.

⁵ S. Jeff Birchall & Nicole Bonnett (2019). Local-scale climate change stressors and policy response: the case of Homer, Alaska, Journal of Environmental Planning and Management, DOI: 10.1080/09640568.2018.1537975.

could translate into comprehensive planning for the entire spit—which is important because our port and harbor are at the end of the spit and our summer economy is focused on the spit.”

Aderhold admits climate adaptation for the city is “not on the front burner,” but she is doing what she can to raise awareness. “Problems with wildlife populations are mounting in Alaska,” she says. “We have warm water ‘blobs’⁶ in the Gulf of Alaska, more bird die-offs and gray whales are dying.” The councilwoman is working with groups like the Kachemak Bay Coastal Estuarine Reserve, a conservation organization funded partly by the National Oceanic and Atmospheric Administration, that is hosting workshops and training programs to raise people’s awareness of climate issues impacting the environment around them. Reserve officials believe climate change will become more of a priority as fisheries become more stressed and new threats arise from warming temperatures, such as shellfish poisoning and harmful algal blooms, which have increased in recent years.

“We are working with local fishermen to try to understand the impacts in their businesses,” says Syverine Bentz, a coastal training coordinator with the Kachemak Bay Reserve. “We are trying to highlight the important issues and give people the planning tools they need...how we can preserve our natural lifestyles in the face of climate change when the resources may not be the same.”

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⁶ Cornwall, Warren (2019). Ocean heat waves like the Pacific’s deadly ‘Blob’ could become the new normal. Science News (January 31, 2019), DOI: 10.1126/science.aaw8401. <https://www.sciencemag.org/news/2019/01/ocean-heat-waves-pacific-s-deadly-blob-could-become-new-normal>.

Sunrise at Kachemak Bay, Homer Spit, Alaska.

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