

A polar bear is walking on a small, rectangular ice floe in the middle of a vast sea of broken ice. The ice floes are scattered across a dark blue ocean, and the sky is a pale, hazy blue. The bear is white and is captured in profile, walking from left to right. Its reflection is visible in a small pool of water on the ice floe it is standing on.

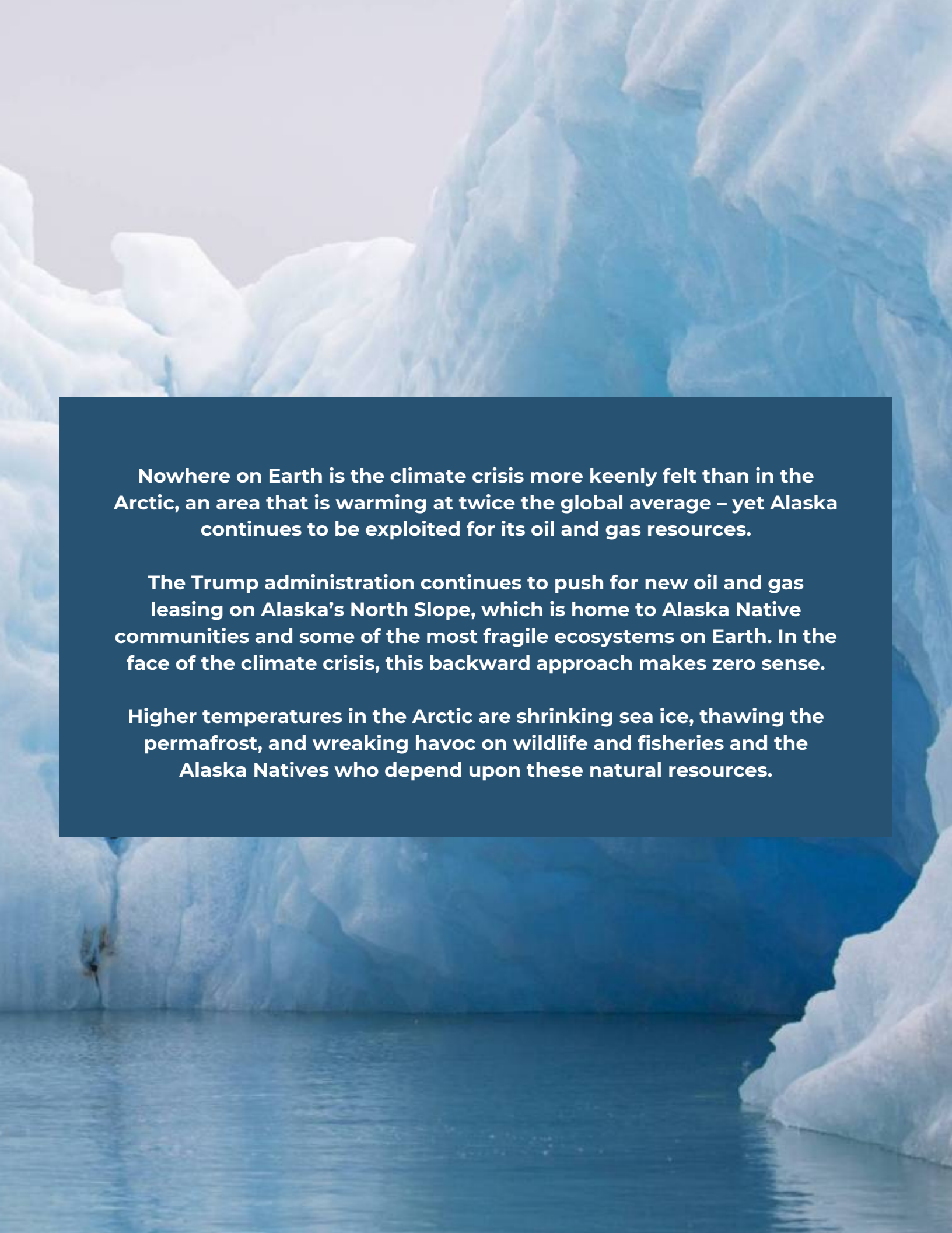
THE MELTING ARCTIC

CLIMATE IMPACTS ON PEOPLE & WILDLIFE

HOUSE COMMITTEE ON NATURAL RESOURCES STAFF REPORT, OCTOBER 5, 2020

NOTE: THIS REPORT WAS PREPARED BY THE MAJORITY STAFF OF THE HOUSE COMMITTEE ON NATURAL RESOURCES. IT HAS NOT BEEN OFFICIALLY ADOPTED BY THE COMMITTEE AND MAY NOT NECESSARILY REFLECT THE VIEWS OF ITS MEMBERS.



A large, jagged iceberg floating in the ocean, with a person climbing on the left side. The ice is a deep blue color, and the water is a lighter blue. The background is a hazy, overcast sky.

Nowhere on Earth is the climate crisis more keenly felt than in the Arctic, an area that is warming at twice the global average – yet Alaska continues to be exploited for its oil and gas resources.

The Trump administration continues to push for new oil and gas leasing on Alaska's North Slope, which is home to Alaska Native communities and some of the most fragile ecosystems on Earth. In the face of the climate crisis, this backward approach makes zero sense.

Higher temperatures in the Arctic are shrinking sea ice, thawing the permafrost, and wreaking havoc on wildlife and fisheries and the Alaska Natives who depend upon these natural resources.



Massive wildfires. Prolonged droughts. Stronger hurricanes. Coastal flooding. Throughout the United States, people are noticing the increased severity and frequency of tragic events that are sending an unmistakable warning: climate change is knocking at our door, and we need to act for the sake of our children and grandchildren.

But in the far north, climate change is not just an emerging problem, but a crisis whose impacts are already acutely felt. It is the present generation that must learn how to adapt to these challenges. For most Americans, the North Slope of Alaska, the Arctic Ocean, and the Bering Sea seem like another world, more commonly encountered in reality shows than in real life. But for the people who live there, the situation is immediate and tragic. Their towns are literally melting away, their food sources disappearing, their environments changing in a way that make their homes nearly unrecognizable. They don't need scientists or computer models to predict how several degrees of warming will dramatically impact their world – they're living it firsthand. And their experiences should be a wake-up call for the rest of us.

Natural Resources Committee Democrats believe that the federal government and our international partners have several responsibilities in light of what is happening in the Arctic. First, we must directly assist the people who are on the front lines and help them plan for and adapt to a vastly different environment, which in some cases means wholesale relocation of villages. Second, we must carefully manage our actions in the Arctic to avoid the complete destruction of food chains and ecosystems. Third, we must take strong and immediate action on climate change in order to limit additional damage to the Arctic and the rest of the world. Sadly, the Trump administration is either failing or woefully underperforming on all of these.

Note: For the purposes of this report, the term "Arctic" include the areas defined as such in the Arctic Research and Policy Act of 1984 (Pub. L. 98-373), as shown in Figure 1.

Arctic Boundary as defined by the Arctic Research and Policy Act (ARPA)

All United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering and Chukchi Seas; and the Aleutian chain.¹



Acknowledgement: Funding for this map was provided by the National Science Foundation through the Arctic Research Mapping Application (armap.org) and Contract #0520837 to CH2M HILL for the Interagency Arctic Research Policy Committee (IARPC).

Map author: Allison Gaylord, Nuna Technologies. May 27, 2009.

1. The Aleutian chain boundary is demarcated by the 'Contiguous zone' limit of 24-nautical miles.

Figure 1. From the U.S. Arctic Research Commission;
<https://www.arctic.gov/maps.html>

Maka Jinaatlaa Monture Paki, an Indigenous author, campaigner, scholar, storyteller, poet, and ceremonial performer from southeast Alaska, perhaps best summarizes the intense challenge of climate change in the state:

“Alaska is on the front lines of climate change, which is just as much of a social and human rights issue as it is environmental. Climate change is already causing accelerated erosion and permafrost erosion- both of which are contributing to infrastructure deterioration. The storm surges and ice melt threaten traditional food security. The vast changes in the land also contribute to mental health disparities. Younger generations will play an important role in addressing these challenges.”

Evidence of the Changing Climate in the Arctic

The data is clear: Alaska and the Arctic are warming twice as fast as the rest of the world, with impacts that become more dramatically evident each year.

- On June 20, 2020, Siberia recorded its first 100°F day, the highest temperature ever recorded in the Arctic Circle;¹
- From October 2018–September 2019, Arctic air temperatures were 1.9°C higher than the 1981-2010 mean and the second warmest on record (Figure 2);²
- Arctic sea ice hit the second lowest level in recorded history in September 2020, while the Bering Sea saw record-low amounts of sea ice in 2019.^{3,4,5}
- In July 2019, Anchorage recorded its first ever 90°F day;⁶ and
- Greenland lost 600 billion tons of ice in the summer of 2019, more than twice the average of the previous two decades.⁷

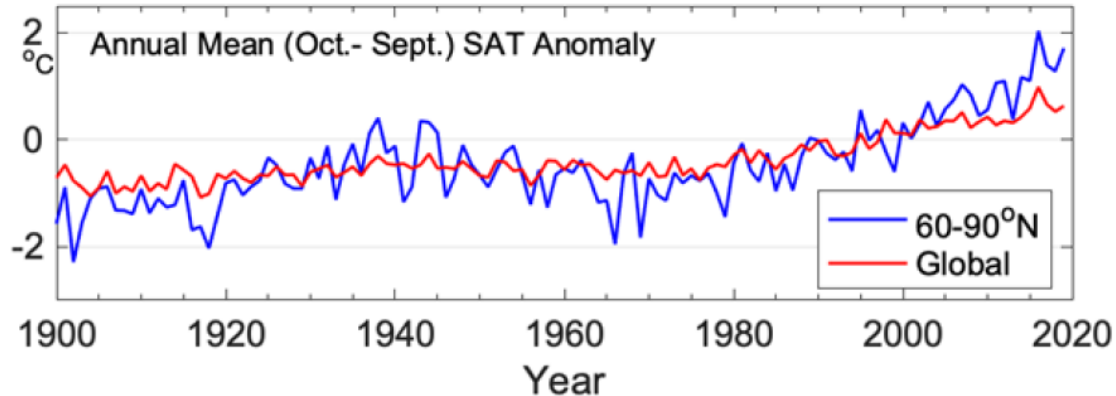
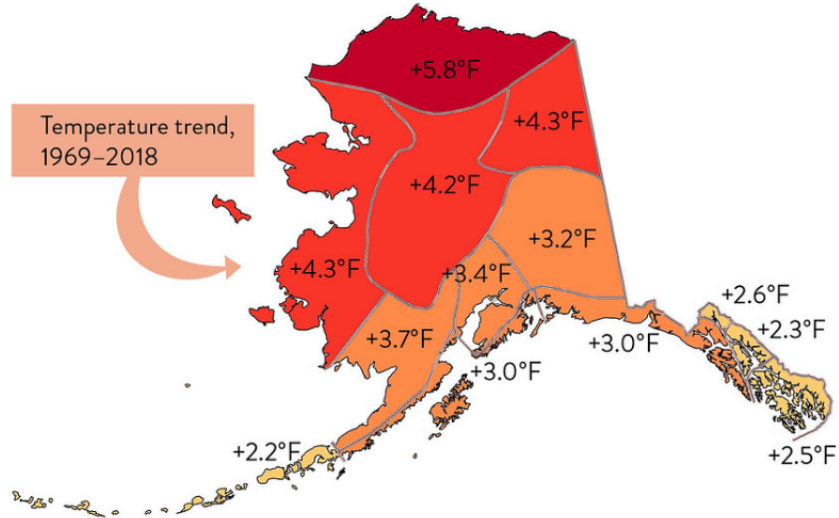


Figure 2. Arctic (blue) and global (red) mean annual land surface air temperature (SAT) anomalies in °C relative to the 1981-2010 mean value. From Ref. 2.

Graphics from the International Arctic Research Center at the University of Alaska-Fairbanks emphatically show the changes the region is undergoing.⁸

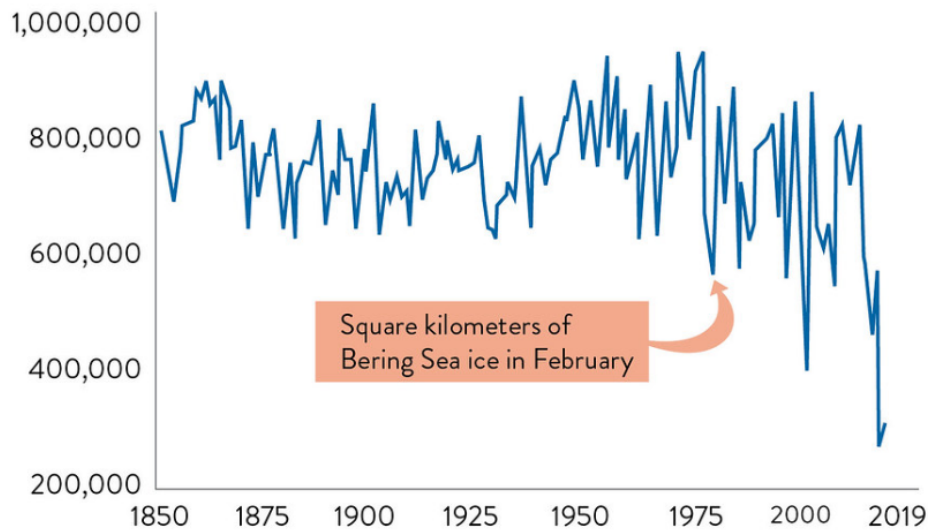
Warming across western and northern Alaska, 1969–2018



Credit: Rick Thoman, Alaska Center for Climate Assessment and Policy.
Data source: NOAA/NCEI



Sea ice extent in the Bering Sea, 1850–2019



Credit: Zachary Labe, University of California, Irvine.
Data source: Scenarios Network for Alaska + Arctic Planning



Impacts of the Arctic's Changing Climate on People

As climate change continues to destabilize the Arctic's fragile ecosystem at an unprecedented rate, Alaska Natives are disproportionately impacted, with rising global temperatures threatening their homes and way of life.

Alaska Native Village Displacement

Alaska is home to an estimated 120,000 Indigenous peoples and 229 federally recognized tribes.⁹ Much of the state's Indigenous population resides in 213 Alaska Native villages, many of which are on the state's 6,600 miles of coastline or in low-lying river areas,¹⁰ where exposure to increased storm surge, melting permafrost, erosion, and rising sea levels caused by climate change have slowly eaten away at the ground supporting their communities.

In a 2003 report, the Government Accountability Office (GAO) found that erosion and flooding affected 184 of the 213 Alaska Native communities, or roughly 86 percent.¹¹ In 2009, GAO found that erosion and flooding imminently threatened 31 communities, 12 of which were looking to relocate.¹² At least four coastal villages – Kivalina, Newtok, Shaktoolik, and Shishmaref, with a total of 1,637 residents – will require complete relocation.¹³

A follow-up report by GAO in 2020 found that relocation due to climate change will soon be unavoidable in some coastal areas. While few communities in the United States have considered climate migration so far, many more will need to consider relocating in the coming decades.¹⁴

Newtok, a village of almost 400 on the southwest coast of Alaska, was the first town in the country to be forced to relocate due to climate change. The village is losing an average of 80 feet of land each year due to river scour, permafrost melting, and storm surge. Homes have been inundated with mold due to frequent flooding from thawing permafrost, causing significant health problems among the young and elderly. The village lost its landing barge and landfill due to erosion, and its drinking water source, homes, school, and airport are threatened.¹⁵

According to a 2019 Denali Commission statewide threat assessment for remote Alaska, Newtok is expected to be uninhabitable within a few years. Unfortunately, these issues are not unique. Many other Alaska Native villages, particularly in low-lying wetlands, will soon have to consider relocation.

Relocating entire villages is extremely costly, and there are limited sources of funding available. GAO estimates that relocating Newtok may cost more than \$200 million. So far, the Newtok relocation has been piecemeal. The most threatened families moved in late 2019, and the rest await additional funding.¹⁶ Other villages have been

unsuccessfully trying to find funding for decades. The estimated cost of relocating the 400-person village of Kivalina is roughly \$100 million,¹⁷ and moving Shaktoolik to higher ground would cost up to \$200 million.¹⁸

One of the biggest challenges to climate migration is the lack of clear federal leadership. Currently, no federal entity exists to oversee Alaska Native village relocation.¹⁹ While the Federal Emergency Management Agency has various adaptation and resilience programs, most villages fail to qualify because of a lack of approved mitigation plans.²⁰ Since 2011, the Tribal Resilience Program within the Bureau of Indian Affairs has provided funding and resources to tribes and villages, but their focus is on adaptation and coastal planning, not relocation.²¹

The Denali Commission, a federal agency based in Anchorage, was founded in 1998 to promote rural development and provide support for the infrastructure needs of rural Alaska. The Denali Commission runs a Village Infrastructure Protection Program designed to assist “rural Alaskan communities that are threatened by erosion, flooding and permafrost degradation.”²² Unfortunately, the Trump administration has proposed eliminating the Denali Commission in each of the past four years,²³ stating that its work “duplicates other federal programs” and that Alaska, with its high oil and gas revenues, does not need financial assistance.²⁴ Congress has rejected the administration’s attempts to kill the agency, but the current funding level of \$15 million is well below the estimated need for village relocation.

The state of Alaska has made some limited attempts to meet these villages’ financial and technical needs. The Alaska Climate Change Impact Mitigation Program (ACCIMP) is the only state program focused on adaptation, mitigation, and relocation efforts through hazard impact assessments and community planning grants.²⁵ The program has yet to advance from its planning stages within these communities, however.

The 2020 GAO report on climate change migration recommends that Congress establish a pilot program to identify and aid communities that need to relocate. A pilot program with clear federal leadership, organization, and funding could help improve the federal government’s capacity to assist in these moves and help Alaska Native Tribes and other at-risk communities relocate more efficiently.²⁶ The need for this program will only increase in the coming years.

Impacts on Traditional Lifestyle

Climate change is also impacting access to subsistence resources, which threatens food security and cultural continuity for many Arctic villages. Melting sea ice is becoming dangerous to maneuver during the spring season, making fishing and travel unpredictable. Changing migration patterns also present a challenge: Kivalina hunters have reported walrus migrations taking place much further away from shore,

unreachable via boat.²⁷ In Nuiqsut, last year's fall whaling season was hindered by warmer waters, resulting in fewer catches, and the warming climate has shrunk the Teshekpuk caribou herd, a critical component of Nuiqsut's food supply, by 40 percent from 2008 to 2013.²⁸

In addition to these challenges, increasing fossil fuel development also poses an existential risk to Indigenous traditions. The people of Nuiqsut—a town located inside the NPR-A, a 23 million-acre tract of public land on the North Slope of Alaska—are increasingly surrounded by oil and gas development. Residents are concerned that the impacts of over-development and climate change threaten their supply of fish and caribou, as subsistence hunters are being forced to travel further away to find food while avoiding the traditional hunting spots that are now dominated by industrial development.²⁹ Future oil and gas development in the Arctic National Wildlife Refuge is a looming threat to the Gwich'in people, whose way of life depends on the survival of caribou herd that relies on the Refuge for calving.³⁰

Raymond Ipalook, Vice President of the Nuiqsut Tribal Council, expressed frustration with the presence of oil and gas development in his community:

"The balancing of living in two worlds, the traditional and economic lifestyles, is one that is difficult to compromise, but ultimately, after all the battles over the wilderness and the oil are done, we are the ones that have to live with the consequences. It is too much, too fast, and too soon. What if it's me who stops the oil, who stops the money, stops the taxes, stops the building; or what if it's me who allows the oil, and then something goes wrong, and then we lose our traditional subsistence way of life?"

Impacts of the Arctic's Changing Climate on Wildlife & Ecosystems

As already mentioned, the Arctic is warming at twice the global average rate, which has caused major changes to the ecosystems and the wildlife that depend upon them.³¹ While many species globally are shifting poleward as temperatures rise, for Arctic species there is nowhere else to go.

The people who have resided in the Arctic for time immemorial also face the impacts of climate change. Jody Potts of the Eagle Village and board member of Native Movement shared the following:

"Alaska's Indigenous people have felt heavy personal losses due to climate change impacts. Warmer winters and hotter summers are creating an unsafe environment for not only the animals, but also the Indigenous people who live so connected to their traditional lands and

depend on the health of the land for their way of life, health and spirituality.”

Sea Ice

Unless warming is kept below 1.5°C, scientists predict that by as early as 2030, the Arctic will be completely ice-free in the summer.^{32,33,34} The decline of sea ice impacts the entire Arctic ecosystem and food web, both in the marine environment and on land. Sea ice not only provides crucial habitat for large animals like polar bears, Arctic foxes, and seals, but is also needed for oxygen-producing algae and phytoplankton that form the basis of the Arctic food chain.³⁵ The decline in sea ice - which is used as seasonal ice bridges for animals - can isolate populations, reduce gene flow, and lead to conflicts with humans.

The age of sea ice is changing, too: in 1985, 33 percent of the Arctic ice pack was older than four years; by March 2019, old ice constituted only 1.2 percent of the ice pack, a decline of over 95 percent.³⁶ Older sea ice is much thicker, sturdier, and better able to withstand summer temperatures and weather than younger ice. Older, thicker sea ice is also necessary for animals like polar bears and walruses; as this ice disappears, these animals are increasingly forced to hunt and breed on land, causing more interactions and conflicts with humans and infrastructure.

Fisheries

Over half of the fish caught in U.S. waters are caught in Alaska, with an average wholesale value of nearly \$4.5 billion a year.³⁷ However, climate change is causing the ocean to become more acidic, leading to outbreaks of harmful algal blooms, and affecting the distribution, abundance, and behaviors of commercially valuable species, putting this important industry at risk.³⁸ In 2018, the Pacific cod fishery, the second-largest in Alaska, experienced a 58 percent reduction in annual catch limits, followed by a fishery closure in the next year. This was the first time the fishery had closed due to concerns over low stock. A study led by the National Oceanic and Atmospheric Administration found that the lack of cod could be traced to egg hatching problems caused by “the Blob,” a 2013-2016 marine heatwave.³⁹

Salmon are a key cultural and economic resource in Southeast Alaska; in 2010, the Bristol Bay sockeye salmon fishery generated \$1.5 billion in sales value and supported 12,000 fishing and processing jobs.⁴⁰ Warming temperatures present many ecological changes for the five species of Pacific salmon found in Alaska. Salmon spend parts of their lifecycle in freshwater and the ocean, rendering them vulnerable to environmental changes in both habitats. Climate change is expected to increase streamflow in freshwater streams and rivers, which could wash away salmon eggs from their spawning substrate.⁴¹ Ocean acidification, a byproduct of higher

atmospheric carbon, could diminish the main food source of juvenile salmon in the ocean.⁴² Already, changing temperatures have altered the abundance and distribution of food for Pacific salmon, so far with mixed impacts on salmon populations.^{43,44} Some projected climate-induced changes may be positive—in the Arctic latitudes of Alaska, the geographic distribution of Pacific salmon is increasing and trends suggest there may be higher abundances of salmon in the future⁴⁵—but there is considerable uncertainty about the ultimate impacts to this economically and culturally crucial fishery.

In the future, warming ocean temperatures are expected to change the distribution of fish stocks across the globe, with fish stocks generally shifting poleward. A study of marine species on the North American continental shelf found that species on the western U.S. and Canadian coasts, including the Gulf of Alaska, are expected to shift the farthest, with some species shifting over 1,000 km in high carbon emission scenarios.⁴⁶ The ecological and fishery management consequences of new fish species in the area are unknown.

Thawing permafrost

Higher temperatures in the Arctic are thawing the permafrost, the subsurface soil layer that remains frozen throughout the year in polar regions. Permafrost soils store about 60 percent of the world's soil carbon, and release greenhouse gases into the atmosphere as they thaw – potentially at a much higher rate than previously estimated.⁴⁷ In addition, as the permafrost thaws, the ground destabilizes, which forms depressions in the ground and damages infrastructure.⁴⁸

Warmer temperatures generate wetter snow and increased melting and re-freezing of the ground, making it more difficult for small mammals to burrow and forage in the soil in the winter months.⁴⁹ The frozen ground of the permafrost has historically limited the northern extent of the tree line, maintaining the frozen tundra landscape; as the permafrost thaws, the tree line is predicted to advance northward, bringing with it a new species composition.⁵⁰

Ironically, even oil and gas companies feel the effects of the thawing permafrost and plant refrigerated tubes in the permafrost to prevent their infrastructure from sinking.⁵¹ On May 29, 2020, thawing permafrost caused a spill of nearly 20,000 tons of diesel oil from a Russian power plant in Norlisk, a town north of the Arctic Circle.⁵² Greenpeace Russia described the spill as the worst in the Russia's history and compared it to the Exxon Valdez spill of 1989 in terms of environmental damage.⁵³ These risks endanger U.S. fossil fuel infrastructure as well: ConocoPhillips has indicated it will need to use 'chillers' to keep the ground frozen at its newest oil development on the North Slope of Alaska.⁵⁴

Sophie Tracey of the Native Village of Point Lay, shared her perspective on the loss of sea ice and permafrost:

“Due to little to no sea ice each year, thousands of walrus will haul out onto our beaches. Anywhere between 40,000 - 75,000 walrus will sit on the beaches. We as a community will do what we can to protect the walrus in hopes of preventing a stampede. At the same time, we are dealing with the melting permafrost, causing many houses and buildings to settle, crack, shift and make the houses uneven, often causing windows to break and leaving doors unable to close.”

Wildfires

Raging wildfires are an increasing problem across the Arctic. Smoke from these wildfires contains climate-warming greenhouse gases and creates black soot that settles on ice and accelerates melting.⁵⁵ Flames can also burn protective vegetation from the permafrost, destabilizing this layer and allowing dead vegetation and animals to thaw and release methane.^{56,57} Mark Parrington, a senior scientist with the Copernicus Atmosphere Monitoring Service, tweeted that “July 2020 has witnessed escalation in Arctic fires previously unseen.”⁵⁸ In fact, in June 2020, intense wildfires in the Arctic released more polluting gases than in any other month in the 18 years since data collection began.⁵⁹ The previous record was set last year. Smoke from Siberian wildfires seems to be stretching to Alaska to as far south as the Pacific Northwest.⁶⁰

Trump Administration’s Actions

Despite the dramatic climate change impacts already being felt in Alaska, the Trump administration continues to push for more drilling, mining, and logging in the area, while undermining science and putting vulnerable people and the stressed environment even further at risk.

NPR-A

In 2013, after years of stakeholder input and compromise, the Obama administration finalized an integrated activity plan (IAP) for the NPR-A, a vast 23-million-acre tract of public lands in the center of Alaska’s North Slope. The IAP struck a balance between allowing oil development and protecting essential subsistence resources and special regions, such as Teshekpuk Lake, which is home to migratory birds, caribou, and polar bears.⁶¹

This compromise was upended just a few months into the Trump administration when then-Secretary of the Interior Ryan Zinke signed a Secretarial Order directing the agency to “jump-start Alaskan energy production.”⁶² The administration is close to

finalizing a new IAP that could open more than 6.5 million acres to new oil and gas leasing and encroach on Teshekpuk Lake.⁶³

In August 2020, BLM issued the Final Environmental Impact Statement for ConocoPhillips' Willow Master Development Plan in the NPR-A. BLM's favorable review of the massive oil and gas project undermines the protection of some of the Reserve's most significant resources and allows for development to take place in the Colville River and Teshekpuk Lake Special Areas.

Northern Bering Sea Climate Resilience Area

In December of 2016, President Obama issued an Executive Order establishing the Northern Bering Sea Climate Resilience Area in the Bering Strait and a portion of the Bering Sea off the eastern coast of Alaska. The Order, supported by 70 federally recognized tribes,⁶⁴ protects the area from oil and gas leasing, industrial shipping, and bottom-trawl fishing.⁶⁵ The Yup'ik, Cup'ik, and Inupiat peoples have relied on the Bering Strait for subsistence fishing and hunting for thousands of years. Each year, millions of marine mammals, fish, and birds cross the Bering Strait to feed and reproduce.⁶⁶ But as climate change rapidly melts the Arctic's permafrost and sea ice, the Bering Strait has gotten more accessible, attracting industrial fishing that threatens wildlife and Alaska Native subsistence hunting and fishing.

President Obama's Executive Order addressed regional climate change issues with local Indigenous guidance, but that effort has not survived the current administration. In 2017, President Trump revoked the Order without any tribal consultation. Mary David, the Executive Vice President of Kawerak, Inc., one of the tribal organizations central to the Obama-era Order, addressed President's Trump's heinous assault on her community:

"When President Trump revoked the Executive Order, which established the Northern Bering Sea Climate Resilience Area, the most viable option for protecting our region's subsistence lifestyle was taken away. There was no consultation. There was no consideration. Policy changes without the involvement of the Indigenous people of the region is not only disrespectful, but it is life-threatening."



From Reference 67

The intentional exclusion of Indigenous voices from decisions critical to their survival underscores the Trump administration’s unwillingness to value human life and environmental protection above industry profits. By re-opening the leasing area to oil and gas development, critical and fragile Arctic ecosystems are again threatened by dangerous industrial practices, and efforts to mitigate the effects of climate change in the region are halted.

Arctic National Wildlife Refuge

The Arctic National Wildlife Refuge is one of the wildest and most remote places in North America. The Fish and Wildlife Service has described it as, “the only conservation system that protects, in an undisturbed condition, a complete spectrum of the arctic ecosystems in North America.”⁶⁸ For the Gwich’in people, whose way of life depends on the caribou that use the coastal plain for breeding, the area is “the sacred place where life begins.”

In 2017, Congressional Republicans attached a provision to their Tax Cuts and Jobs Act that opened the Arctic Refuge to oil and gas development. The administration has moved at breakneck speed to try to make the first lease sale happen well in advance of the four-year deadline in the Act, with reports that career scientists are being silenced or overridden as part of a process that has been described as “off the rails.”⁶⁹

In August 2020, the Trump Administration approved plans to offer oil and gas leases across all 1.6 million acres of the Refuge's coastal plain. The federal government could auction drilling rights before the end of this year.⁷⁰

Some places are simply too wild and too fragile to drill, particularly areas that are on the front lines of climate change and already being hurt by massive temperature changes. Teshekpuk Lake and ANWR's coastal plain are areas that need to be protected and preserved, not destroyed.

Tongass National Forest & Bristol Bay

Further south in Alaska, the Trump Administration continues to make decisions influenced by industry without regard to fragile and essential ecosystems.

The Tongass National Forest is a 16.7-million-acre stretch of temperate old-growth rainforest in Southeast Alaska that the Trump administration is moving to open to the timber industry. The Tongass is the country's most important national forest for climate change mitigation and resilience, with a tremendous ability to store carbon in the trees and soil.⁷¹ Despite this, the administration is moving to undermine protections and increase logging, damaging this priceless carbon sink.

In Bristol Bay in Southwest Alaska, Alaskans and Alaska Native communities rely on healthy watersheds to sustain salmon populations needed for subsistence and the local economy. The Trump administration, however, has sided with mining companies to reverse an Obama-era decision that would have protected the watershed from the proposed open-pit Pebble Mine, which the EPA found in 2014 would cause "complete loss of fish habitat due to elimination, dewatering, and fragmentation of streams, wetlands, and other aquatic resources."⁷² For regional fisheries facing severe stress and dislocation due to climate change, a dangerous mine is an unacceptable risk.

In July 2020, the Trump Administration released the Final Environmental Impact Statement (FEIS) for Pebble Mine. In the FEIS, the U.S. Army Corps of Engineers found that the mine would not hurt the long-term health of the valuable Bristol Bay salmon fishery, or significantly impact salmon returns. This conclusion directly contradicts EPA's 2014 findings, and has drawn criticism from tribes, fishing and conservation groups, lawmakers, and other political figures. While the Army Corps has delayed the process amidst Fox News criticism and Trump family tweets,⁷³ and the developers of the mine were recently recorded admitting that the project is likely to be much larger than they have been claiming publicly,⁷⁴ it is still possible for the Pebble Mine to receive a permit before the end of the year.⁷⁵

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