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Climate Change & Conservation Subject Guide

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This guide is intended to assist researchers in locating materials pertaining to climate change, conservation, and subsistence in Alaska, housed at the Anchorage Museum Archives. It is not necessarily a complete listing of all climate change in Alaska-related holdings. Please contact archives staff at resourcecenter@anchoragemuseum.org or 907-929-9235 for assistance in locating other collections of interest.

Description

Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional, and global climates. Changes observed are primarily driven by human activities, such as fossil fuel burning, industrial activities, unsustainable agriculture and livestock practices, and deforestation. While these changes have an immense global impact, Alaska is on the front lines of the climate crisis. The vulnerable nature of Alaska's climate stems from the presence of permafrost, glaciers, and sea ice. As temperatures rapidly rise and ice thaws, the overall condition of the environment suffers from drier landscapes, altered wildlife habitats and biodiversity, infrastructure damage, and greenhouse gas release. Climate change-related consequences also impact subsistence, a sustainable way of living off the land. Many communities that practice subsistence traditions face pressures from encroaching infrastructure, agriculture, mining, logging, and other activities that also endanger biodiversity.

This guide is a collection of images that provide insight into the unique, diverse environment of Alaska. These photographs range from images of subsistence practices reliant on Alaskan flora and fauna to images of harsh anthropogenic practices. Using photographs for the study or general observation of climate change, one can see the difference between the environment of Alaska in the past and the present. Additionally, these images provide a contrast between commercial and subsistence practices that can shed light on the conservation efforts and regulations necessary to preserve the Alaskan landscape.

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M

Using This Guide

This guide is divided into four categories, with each category representing a unique area of climate, conservation, and subsistence in Alaska. Each category includes a description that provides context on the subject matter. Within each category, there are specific materials from the Anchorage Museum collections that relate to the subject.

Subjects

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Fossil Fuel Usage & Industry

Fossil fuels are nonrenewable resources such as petroleum, natural gas, and coal. Natural gas is Alaska's main source of energy, but destructive resource extraction harms the local Alaskan and global climate. The extraction processes take a great toll on local landscapes and ecosystems and pose a large threat to waterways and groundwater systems. Additionally, the burning of fossil fuels emits harmful air pollutants and greenhouse gases, which trap heat in the atmosphere and contribute to climate change.

Coal Mining

While coal accounts for a minority of U.S. electricity, there are currently more than a dozen coal-related projects in Alaska as up to 1/8 of the world's total coal resources are found in Alaska. These projects include strip mines, rail and road extensions, and more. These mining practices can uproot and pollute entire ecosystems. Coal is recognized as a "dirty fuel" as it releases significant amounts of carbon emissions when burned.

-B1979.002.4884 - Lynn Coal Mine Special carrier near Nenana River Bridge
-B1979.002.AEC.JT04 - Healey River Coal Corporation Mines
-B1979.002.AEC.JT06 - Healey River Coal Corporation Mines
-B1979.002.Album1.283 - Matanuska Coal Mine
-1976.056.161 – Effie Bornhoft, *Jonesville Coal Mine, Glenn Highway, M.P. 78*

Infrastructure & Pollution

The American Lung Association "State of the Air" 2019 report found that Alaska has some of the worst air quality in the nation. One major air quality issue is particle pollution, commonly called soot. Particle pollution is made of soot or tiny particles that come from coal-fired power plants, diesel emissions, wildfires, and wood-burning devices.

-B1983.058 - Dowell Aleutian Islands Clean-up. Debris removal team survey of various World War II-era sites. Images depict extensive wartime pollution and abandoned military infrastructure.
-B1990.014.004.pollution.jun91p2.29 - Pollution at Point Spencer, Port Clarence, Bering Sea, near the Indigenous village of Teller [Marsden matting debris from World War II airstrip, June 1991.] Large, rusted metal airstrip components littering beach.
-B1996.035.1.042, .201, .233-234, and B1996.035.106 - Views of military-altered landscapes and infrastructure showing active wartime pollution. Many of these sites, including equipment, machinery, and buildings, would be abandoned post-war.

-B1996.035.2.538 and .540 - Aerial view during bombing run with active explosions and visible bombing debris and air pollution. The effects of this chemical, particle, and waste pollution are likely long-lasting and negatively impact all life in the area.
-B1997.003.178 - Smoke Stacks
-B1998.014.1.1170 O33 - Sky Twins - Smoke Stacks
-B1997.011.1-432 - Depicts environmental cleanup of abandoned military sites in Alaska, during 1966 and from 1984-1985.

Logging

The logging of old-growth trees can greatly harm ecosystem health and lead to habitat loss for many plant and animal species. While trees are a renewable resource, unsustainable logging practices permitted by current legislation pose a threat to national forests and refuges. One case of this is the push by Alaska's congress to open up the Tongass National Forest, the largest U.S. National Forest to logging. Many of the photos below depict small-scale logging practices, a stark contrast to mass deforestation that can result from clearcut logging.

-B1984.077.14.018 - Riverbed, log structure, logs
-B1986.004.1104 - Logs ready for sawing
-B1990.014.5.Logging.1.13.1-10 - Trucks with Logs
-B1990.014.5.Logging.1.19.1-9 - Timber
-B2015.008.407 - Wood pile, after lumbering, March 1921
-2013.010.001 – David Woodie, *Washington 127* (2000)

Oil Drilling

Oil drilling in Alaska has already led to significant consequences in land and marine ecosystems. Seismic techniques may harm marine mammals and fish and can disrupt the natural migration patterns of mammals such as polar bears. Drilling also releases harmful air pollutants, and oil spills can have devastating effects on soil conditions, biodiversity, and environmental safety. These photos are images of oil drilling practices throughout several decades. Most recently, during the Trump Administration, the Arctic National Wildlife Refuge was under threat of oil and gas development.

-B1994.008.295 - Atlantic Richfield Platform Spark Cook Inlet
-B1994.008.410.slide - Oil well drill bit changing
-B1994.008.545 - Pipe storage Atigun Pass Brooks Range
-B2017.012.219 - KIC [aerial of Chevron KIC #1 well, Arctic National Wildlife Refuge]

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Protests

These images show climate change protest and commentary through artistic expression.

-2017.022.002 - Nicholas Galanin, *Envoy* (2016)
-2020.004.001 - Rebecca Lyon, *Dominion* (2020)

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Wildlife

The wildlife of Alaska is both diverse and abundant, and Alaskan ecosystems are a crucial habitat for fish and wildlife species. The rapidly rising temperatures, sea levels, and wildfires have all posed a threat to Alaskan wildlife. Biomes are shifting north due to rising temperatures which affects biodiversity in existing regions, and reduction in ice has greatly impacted species such as polar bears, walruses, and seals. Changes in the environment also pose a great threat to subsistence and the communities that rely on these species for tradition and survival.

Anthropogenic Impact on Wildlife

These photos demonstrate direct anthropogenic consequences on Alaskan land and wildlife.

-B1984.077.8.025 - Bear at trash barrel
-B1990.014.4.pollution.jun91p2.29 - Pollution at Point Spencer
-B2009.017.1984.11 - [couple reading newspaper headlined 'City streams Seriously Polluted']
-B2016.004.962 - Cleaning the shoreline, Bethel, AK [excavator removing junk automobiles piled along shore, man sitting on bluff at right]
-2006.016.004 - Dennis Witmer, *Trash* (1998)

Moose

Rapidly increasing temperatures pose a threat to the moose population as their highly insulative coat makes temperature regulation and cooling difficult. Moose that experience heat stress may be unable to forage and gain enough body fat to sustain themselves during the winter. Warmer weather has also led to the spread of parasites such as the winter tick and brain-worm, which have depleted moose populations throughout Alaska and North America. Additionally, changing tree species may make finding shade more difficult for the Alaskan moose population.

-B1991.011.22 - June 1961 Eliz. Bergman, Allakaket Cleaning Moose hide
-B1998.014.1.2205 - Alaska moose by Art Frisbie "moose in trees"
-B1998.014.1.2225 - Winter scene of moose standing among birch
-B2001.036.83 - Bleaching moose hide, Allakaket, AK
-B2006.023.8684 - Moose at Moose Pass, Alaska
-1955.006.134 - Camera bag, Yup'ik or Inupiaq artist, c. 1943
-1964.005.001ab - Slippers, Walter Northway (Athabascan), 1941
-1972.102.011 – Milo Minock, *Moose Catch* (c. 1972)

Polar Bears

Arctic sea ice has been rapidly depleted by rising temperatures, and sea ice is an essential habitat for polar bears. Polar bears have suffered declines due to the loss of their habitats, and further sea ice loss is predicted to cause nutritional stress to polar bears. Potential oil drilling in the Arctic National Wildlife Refuge would worsen climate pollution and carbon emissions in the area, enhancing the harm to populations like the polar bear.

-B1965.018.763 - Polar Bear Cub
-B1990.014.4.10911 - Female Polar Bear with yearling cubs: Chukchi Sea.
-B1990.014.4.SCN.25.12235 - Sea Ice
-B1990.014.5.Animals.19.002 - Two polar bears on snow
-B2018.023.089a - Polar bear swimming in open water
-1970.156.002 – George Ahgupuk, *Nine Scenes from Eskimo Life* (1951)
-1973.027.001 – Fred Machetanz, *The Invaders* (1973)
-2019.009.001ab - Bryndis Snaebjornsdottir, *Shooting the Messenger* (2018)

Salmon

The changing snowpack of Alaska poses a potential danger to salmon, a critical fish species in Alaska. Changes in the snowpack affect the freshwater waterways, which can then change the growth rates, movement patterns, survival, and reproductive success of salmon. Warmer waters impede the development of young fish and lead to stress in adults, causing reduced spawn rates. Threats to salmon also pose a threat to Indigenous Alaskan lifeways, as Alaskan salmon plays an integral part of tribal religion, culture, and physical sustenance.

-B1983.091.S0156.R10 - Salmon Inds & Bristol Bay Salmon Fleet
-B1983.091.S0156.R11 - Salmon Inds & Bristol Bay Salmon Fleet
-B1983.091.S0156.R23 - Salmon Inds & Bristol Bay Salmon Fleet (Unloading fish, & inside cannery,
-B1983.091.S0171.R01 - Woman kneeling on a pad fishing; small fish in pile on right
-B1983.091.S0171.R05 - Woman sitting on straw ice fishing
-B1983.091.S5066.001-7 - Spawned salmon dried onshore, Kenai River, Sep-1972
-B1993.020.2421 - Salmon drying
-B2006.023.5247 - Salmon spawning in Lake Creek
-1955.006.103ab - Mittens, Yup'ik artist (attributed)
-1980.053.005 - Robert Mayokok, Untitled – Man, fish net, and salmon, mid-20th century
-1985.019.001 - E. Helgason, *Salmon Camp in Chignik* (1943)

Seals

Three seal species, Ribbon, Spotted, and Harbor Seals are all experiencing declining conditions because of rapid warming and transformation in the Arctic region. Arctic seals need the ice's solid surface to carry out basic survival activities, from resting to molting to raising young. Additionally, seals are an important component in maintaining Indigenous Alaskan subsistence culture because seals are a source of food, and skins are used for clothes, boats, and crafts. Threats to the seal populations in Alaska could also threaten the communities that practice this traditional human-animal relationship and subsistence.

-B1990.014.4.Animals.25.37642 - Adult & Sub Adult Male Fur Seal Callorhinus Alascanus St. Paul Village Pribilof Isl.
-B1993.012.39B - Seal hunter returns to Nome, from off the ice.
-B1998.014.1.107 - A43 Alaskan seal (fur seal)
-B1998.014.1.2243 - Young hair seal with fish; March 8, 1958
-B2007.005.5.77 - Seal pokes on sled
-1955.006.141 – Pants, Sammy Mogg
-1987.048.001 – Henry Elliot, *The Fur Seal Millions* (1872)
-2014.031.019 - James Barker, *Toksook Bay seal hunters George Chimugak and James Charley push through ice toward open water* (1980)

Walrus

The accelerating retreat of sea ice in Alaska is limiting the amount of space available for walruses to congregate. The receding ice also forces walruses to desert the ice and seek refuge ashore. Once on land, the walruses must travel much longer distances—up to 250 miles round trip—to reach their food supply. Additionally, disturbances to the mass aggregations can lead to deadly stampedes.

The walrus also provides large amounts of nutrition and the consumption of this subsistence resource is culturally and spiritually important to the people of the communities. Walruses are an essential nutritional and cultural marine resource used by Indigenous Alaskans throughout western and northern Alaska. Several thousand walruses are legally harvested in Alaska and Russia every year. The meat, blubber, skin, and organs provide a healthy and rich source of food, the hides can be processed into rope or used to cover boats, and the stomach lining is used to make traditional drums for Indigenous Alaskan ceremonies and celebrations. The ivory tusks are hand-carved into tools, jewelry, artwork, and other handicrafts.

-B1970.028.309 - Walrus Skins
-B1981.164.069 - Museum specimens [two Indigenous men with walrus on beach]
-B1983.091.S4187.182 – Walrus herd on shore
-B1983.091.S4187.188 – Walrus herd on shore
-B1985.027.2707 - Wien - Tourism - Walrus
-B1985.027.tourism.nonumber1 - Texans by walrus heads.
-B2017.024.2105 - King Island, copyright 1986 [two men butchering walrus; binoculars]
-1955.003.022 – Bear figurine, Inupiaq artist (attributed)
-1955.003.307 – Ulu, Inupiaq artist (attributed)
-2017.022.002 - Nicholas Galanin, *Envoy* (2016)

Whales

Rising sea temperatures have led to unprecedented whale migration patterns, particularly in the bowhead whale species. Warmer waters closer to the shore or distant food sources such as plankton influence their location, and the location of these whales is essential to certain cultural and subsistence traditions. For example, the bowhead whale hunt is an essential cultural and subsistence practice for the Inupiat people of Alaska's North Slope.

-B1985.027.1590 - Point Hope whaling captain
-B1990.014.4.03194 - Watch sea for whale. Point Hope
-B1990.014.4.05166 - Eskimo boys imbibe the Whaling culture: Pt. Hope
-B1990.014.4.15307 - St. Lawrence Isl. Yupik Eskimo Strip "Muktuk" (Skin & Blubber) From Whale.
-B2007.008.17 - Whale at Port Armstrong Alaska
-B2012.025.25 - Whales at Akatan Alaska whaling station
-B2016.004.21.12-17 - Barrow, Whale Feast
-B2016.004.341 - Harvesting whale blubber and baleen, Barrow, Alaska
-1955.003.002 - Sled runners, Inupiaq artist (attributed), c. 1900
-1969.098.001 – Fred Machetanz, *Dividing the Muktuk* (1969)
-1970.152.005 – John Tingook, *Men in Umiak Harpooning Whale*
-1972.102.021 – Milo Minock, *Chasing a Whale* (c. 1972)

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Ice and Permafrost

Alaska's permafrost, frozen ground, sea ice, and glaciers are all suffering due to rapidly rising temperatures. Alaska's melt rates are stated to be among the highest on the planet, with major glaciers such as the Columbia glacier retreating about 115 feet per year. Additionally, as permafrost thaws, greenhouse gases and ancient bacteria and viruses are released.

Erosion

Climate changes, such as more frequent and intense rain events, can increase erosion and result in greater amounts of sediment washing into rivers, lakes, and streams. For Alaska, erosion is a pertinent risk as warmer and higher seas lead to more frequent severe storms, reduced coastline protection, and flooding. Coastal erosion is threatening Indigenous Alaskan villages, sensitive ecosystems, and other infrastructure.

-B1990.014.004.11570 - Cabin settled 4ft in 8 years due to thawing of underlying permafrost.
-B1995.014.31.1,12-13 - U.S. Army small tug ST-379 on river near landslide area
-B2014.005.506 - Aerial of track in landslide
-2002.028.002 – Sam Kimura, *Erosion* (1984)
-2011.010.003 - Brain Adams, *Untitled (Basketball hoop in snow)* (2010)
-2011.010.004 - Brian Adams, *Kivalina Sewall* (2007)
-2018.007.009 - Brian Adams*, Lynden Weyiouanna* (2015-2016)

Glaciers

Glaciers that exist today are remnants of the last ice age, and now, glaciers are among the most dramatic evidence of Earth's rapid warming. Glaciers worldwide are losing mass at an accelerating rate. Rising sea levels pose a risk to waterways and infrastructure, and runoff can put coastal communities at risk of erosion and landslides.

-B1990.014.5.Scn.1.208 - Tourist at Worthington Glacier
-B1990.014.5.Scn.8.016 - Hubbard Glacier
-B1995.014.40.16 - Scenic of glacier terminus
-B2013.010.1034 - Portage Glacier
-B2015.008.078 - Roaring Glacier
-B2015.008.162 - Columbia Glacier
-B2015.008.595a - Childs glacier or Miles glacier and Copper River
-B2015.008.785 - T9 Glacier Terminus

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Ice cellars

Permafrost is frozen ground that is typically located a few feet below the soil surface in extremely cold regions. Eighty percent of Alaska's surface lies above permafrost. Many Indigenous Alaskans use ice cellars deep within the permafrost to preserve food. As temperatures rise and permafrost thaws, there is now a growing risk of losing these traditional siġluaqs, or ice cellars, which are a key aspect of Inupiat culture.

-B1990.014.4.08326 – Permafrost stratigraphy
-B1990.014.4.permafrost.jun70p4.32 - thawing permafrost
-B1990.014.5.Science.13.29 – Meat stored in ice cellar
-B1990.014.5.Science.13.32 – View down into ice cellar at Wainwright
-B2016.007.1345 – Entrance to a permafrost ice storage

Sea Ice

Sea ice is frozen ocean water that keeps the polar regions cool and helps moderate the global climate. Changes in sea ice level can disrupt normal ocean circulation, which further impacts the global climate. Rising sea levels endanger coastal communities by worsening coastal flooding and increasing storm surge. With less sea ice, animals that depend on it for survival must adapt or perish. Species that are impacted are polar bears, walruses, seals, and arctic foxes.

-B1990.014.4.03391 - Alaskan littoral of the Bering and Chukchi seas.
-B1990.014.4.SCN.25.00766 - Large pan ice develops in areas of less current of the sea.
-B1990.014.4.SCN.25.12235 - Sea Ice
-B1990.014.2018.1.307.003 - woman wearing parka ice fishing on sea ice, snow
-B2013.075.129 - Village scene, snow, sea ice, dwellings, 1966

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Plant Life

Alaska's vegetation and plant life are changing dramatically due to climate change. Regions of Alaska are experiencing high levels of yearly variability in vegetation growth, and vegetation across Alaska's coastal southwest has decreased sharply - more than anywhere else in the state. Changes in vegetation could be due to soil erosion, extreme freeze cycles, and a rise in biological threats like parasites and bacteria.

Higher temperatures and drier conditions increase the risks of drought, wildfire, and insect infestation. Large wildfires have harmed more boreal forests in Alaska in the last ten years than in any other decade recorded, and these intense wildfires threaten the populations of cedar, hemlock, and spruce trees. Additionally, warmer temperatures are also expected to worsen insect damage to forests across much of the state.

The health of these forests is crucial as wood is an essential part of subsistence and daily living. Communities use wood boilers for energy and heat and timber is also used for smoking and preserving fish and meat. Wood from spruce and cedar trees is also essential to creating traditional handicrafts and tools like the photos shown here.

-B1984.077.7.031 - Uprooted tree, weathered roots, trees in background.
-B1989.016.1684.4 - Scenic with rocks and river in foreground, trees, snow-capped mountains
-B1990.014.4.Science.22.1993sep.d11.32 - Alaska paper birch
-B1990.014.4.Science.22.17616 - Evergreen forest of southeastern Alaska: spruce, hemlock, and cedar.
-B1990.014.4.Science.22.124744 - Trees are Picea Sichensis Sitka Spruce & Western Hemlock Tsuga Heterophylla
-B1990.014.4.Science.22.HSSS371853 - Birch grove
-B1990.014.4.Science.22.VU38592 - Black spruce
-B1990.014.4.Science.22.VU111606 - Thuja plicata donn. Western Cedar, Tongass Forest, southeast Alaska
-B2017.011.168 - Alaska '47 – Fairbanks, Birch Tree
-1976.056.159 – Effie Bornhoft, *Kenai Lake, Alaska* (1952)
-1977.060.001 - Feast Dish, Haida artist, c. 1850
-1998.031.001 – Diane Douglas-Willard, *Seaweed Basket* (c. 1997)

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RELATED MATERIALS

Museum Exhibits and Records
Alaska Gallery Pipeline Exhibit (1998)
Gyre: Plastic Ocean (2014)
On Ice (2015)
Cruising the Fossil Coastline (2017-2018)
Unsettled (2018)
Listen Up: Northern Soundscapes (2021)
Borealis: Life in the Woods (2021-2022)
Protection: Adaptation and Resistance (2022-2023)
Water Moves Life (2022-2023)
Lamont Hamilton: To Hear the Earth Before the End of The World (2023-2024)

Vertical Files
Alaska – Industry
Alaska State – Department of Fish & Game
Alaskan Indigenous People – Subsistence
Arctic National Wildlife Refuge (ANWR)
Athabascan People – Hunting and Fishing
Bears
Birds – Alaska
British Petroleum
Canol (Pipeline)
Exxon-Valdez Oil Spill
Fishes – Alaska
Fishing – Alaska
Hunting
King Salmon
Moose
Naval Petroleum Reserve No. 4
Northstar Oil Field
Permafrost
Petroleum Industry and Trade
Pipeline Impact

Plants
Polar Bears
Salmon Canning Industry
Sea Otter
Trans Alaska Pipeline
Walrus
Whales
Whaling

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The Arts and Humanities on Environmental and Climate Change: broadening approaches to research and public engagement, Sarah Sutton, 2023

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Assessment of the Known Cultural Resources in the National Petroleum Reserve in Alaska, William S. Schneider, 1977

E99 .E7 S53 1981 v.1
Slogging, Humping, and Mucking through NPR-A: an archeological interlude, Craig W. Davis et al., 1981

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Exploring Alaska's Prince William Sound, Its Fjords, Islands, Glaciers, and Wildlife, Neil C. Johannsen, 1975

F914 .K4 M63 1997

Archaeological Survey for the Ninilchik Dome Drill Pads, Kenai Peninsula, Alaska, Charles M. Mobley, 1997

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A History of the Arctic: nature, exploration and exploitation, John McCannon, 2012

GB641 .P4 1966

Permafrost and Its Effect on Life in the North, Troy Lewis Péwé, 1966

GE160 .A68 D46 2019

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GF71 .M37 2015

Fierce Climate, Sacred Ground: an ethnography of climate change in Shishmaref, Alaska, Elizabeth K. Marino, 2015

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GF891 .A72 2020

Arctic: culture and climate, Amber Lincoln et al., 2020

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The Northern World, AD 900-1400, Herbert Maschner et al., 2009

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HD9567 .A4 425 2016

Too Close to Home? McKibben A. Jackinsky, 2016

HD9567 .A4 A64 1969

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Extreme Conditions: big oil and the transformation of Alaska, John Strohmeyer, 1997

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The Melting Edge: Alaska at the frontier of climate change, Michael Collier, 2012

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Arctic Thaw: climate change and the global race for energy resources, Stephanie Sammartino McPherson, 2015

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Climate of the North Slope, Alaska, Harold W. Searby, 1971

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The Climate of Alaska, Martha Shulski and Gerd Wendler, 2007

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Brave New Arctic: the untold story of the melting North, Mark C. Serreze, 2018

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Petroleum Geology of the Northern Part of the Arctic National Wildlife Refuge, Northeastern Alaska, Kenneth J. Bird and Leslie B. Magoon, 1987

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The Petroleum Fields of the Pacific Coast of Alaska: with an account of the Bering River coal deposits, G.C. Martin, 1905

QE75 .P9 no.1240-C

The National Petroleum Reserve in Alaska: earth-science considerations, George Gryc, 1985

QE75 .P9 nos. 301-305

[Geological reports on Alaska, 1944-1966]

Keywords: Core tests; Geology; Gravity; Gubik formation; Mesozoic rocks; Oil; Petroleum; Phosphate; Seismic Activity; Source-rock potential; Test wells; Trans-Alaska Pipeline; Triassic Formations; Vegetation; West Coast Petroleum Supply

Locations: Arctic Slope; Barrow; Brooks Range; Chandler River; Corwin; Etivluk River; Fish Creek; Grandstand; Itkillik; Killik; Killik River; Knifeblade; Kaolak; Maybe Creek; Meade; Naval Petroleum Reserve no. 4; Northern Alaska; Northwestern Alaska; Oumalik; Sagavanirktok River; Sentinel Hill; Shainin lake; Shaviovik River; Simpson; Square Lake; Titaluk; Topagoruk; Umiat; Utqiagvik; Utukok; Wolf Creek

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Alaska and Its Wildlife, Bryan L. Sage, 1973

QH105 .A4 G38

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Land of Extremes: a natural history of the Arctic North Slope of Alaska, Alexander D. Huryn, 2012

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