



What is there to see?

From coastal fjords where tide-water glaciers calve into the sea, to the vast Harding Icefield, to newly emerging rainforest, Kenai Fjords National Park has something for everyone. Although much of the Park is rugged wilderness, there are ways to explore for all interests and abilities. Whether you take a boat tour or kayak in a remote fjord, you will be surrounded by pristine

scenery and abundant wildlife. A hike to the top of the Harding Icefield Trail or scenic over flight gives you a window to past ice ages. Exit Glacier is the easiest part of the park to access. Here, you can stroll the trails, take a ranger-led walk and get close enough to hear the creaks and groans of an active glacier as it slowly sculpts the landscape.

Park Facts

Park Designation: 1980 to protect the Harding Icefield and its outflowing glaciers and coastal fjords
Acreage: 670,000
Highest Elevation: 6,612 ft. Mt Truuli (2500 ft above the icefield)
Lowest Elevation: sea level
Average Annual Precipitation: 80-150 in of rain
Mammals: 40 species
Birds: 191 species
Fish: 40 species including 5 species of Pacific salmon (pink, chum, silver, red, king)
Glaciers: at least 38
Longest glacier: 13 mile long Bear Glacier
Cool fact: largest icefield entirely within U.S. borders

Weather

The park is located in southcentral Alaska on the edge of the temperate coastal rainforest. Summer daytime temperatures range from the mid 40s to the low 70s (Fahrenheit). Overcast and cool rainy days are frequent. Winter temperatures can range from the low 30s to -20. Exit Glacier area averages close to 200 inches of snowfall annually, but conditions vary greatly. The top of the Harding Ice Field receives 600 – 800 inches of snowfall annually.

What animals live here?



Kenai Fjords National Park is home to a variety of land and marine (sea) mammals. The park offers animals a feast. On land, animal life ranges from 1/3 ounce songbirds called chickadees to bull moose that can weigh up to 1,600 pounds.

Black Bears are anything but picky eaters. Leaves and grass, berries, insects, salmon, and even moose calves are all a part of their diet. Black bears need to gain enough weight in the summer to survive hibernation in the winter months

Marine mammals have evolved over time to spend a life in cool water. Many marine mammals, including orcas, have an insulating layer of fat called blubber that keeps their bodies warm and buoyant. Sea otters can be seen twirling and fluffing their thick fur in the water to trap air next to their skin.



Homework Help

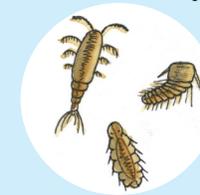
Kenai Fjords National Park is a place for students to see geological forces in action, climate change captured in glacial changes, succession in clearly defined steps and animal adaptations that allow for life in a sometimes harsh environment.

Life in the Sea

The Fjord Estuary Ecosystem
The fjord estuary ecosystem is one of the richest assemblages of life on earth, but not one of the most well known.



Phytoplankton, or plant plankton, is the primary producer and the key ingredient of the complex marine food web. Phytoplankton thrive in the waters here because of the long days of sunlight in the spring, the cold oxygen-rich seawater, and the nutrient-rich freshwater.



Phytoplankton uses the sun's energy to convert carbon dioxide and nutrients into carbohydrates, and becomes food for microscopic creatures, called zooplankton, that feed on them. The presence of great numbers of phyto and zooplankton bring the larger consumers to the fjords to feed. Consumers range in size from sand lance, a small fish, to the humpback whale that travels 2,700 miles in the spring to eat here. The complex web of life flourishes here because there is so much to eat!



Threatened and Endangered Species

Humpback whale
Right whale
Blue whale
Bowhead whale
Peregrine falcon
Northern goshawk

Gray-cheeked thrush
Townsend's warbler
Blackpoll warbler,
Steller sea lion
Sea otter
Harbor seal

Kenai Fjords

Kenai Fjords National Park
Alaska

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What plants grow here?

Kenai Fjords National Park has a diversity of plant life separated into zones – coastal, the coastal rainforest, and the alpine tundra. One of the most unique characteristics of our plants is their ability to grow in areas that were recently covered by glaciers. Plant species, such as fireweed, black cottonwood and feltleaf willow can live in poor soils and create better conditions for more plants and trees to grow.



Coast

Intertidal Zone

The intertidal zone is the area of land that is exposed to the air at low tide and is underwater at high tide. Inhabitants have adaptations for both wet and dry conditions. Despite looking like plants, kelp are large seaweeds that are actually algae. Kelp grow outrageously fast - bullwhip kelp grows more than 100ft a season!

Cliffs

Steep coastal cliffs were carved by massive glaciers that once poured into the sea. Today, pregnant female mountain goats trek down these cliffs to give birth at the edge of the sea.



Temperate Rainforest

Kenai Fjords boasts the northern-most boundary of the temperate rain forest. The park receives 80-150 inches of rainfall a year; triple the amount of rain Seattle, Washington receives. Damp conditions protect the forest from fire and insect pests. Western Hemlock and Sitka Spruce dominate the canopy.



Alpine Tundra

The alpine tundra is a windswept, treeless area that extends from treeline to the highest mountain peaks. Much is bare rock. Because of the cold temperatures and wind, most plants are small groundcover plants which grow slowly. They protect themselves by hugging the ground. Taller plants would get blown over and freeze. Shown above are blueberries and crowberries.

As the glacier recedes...

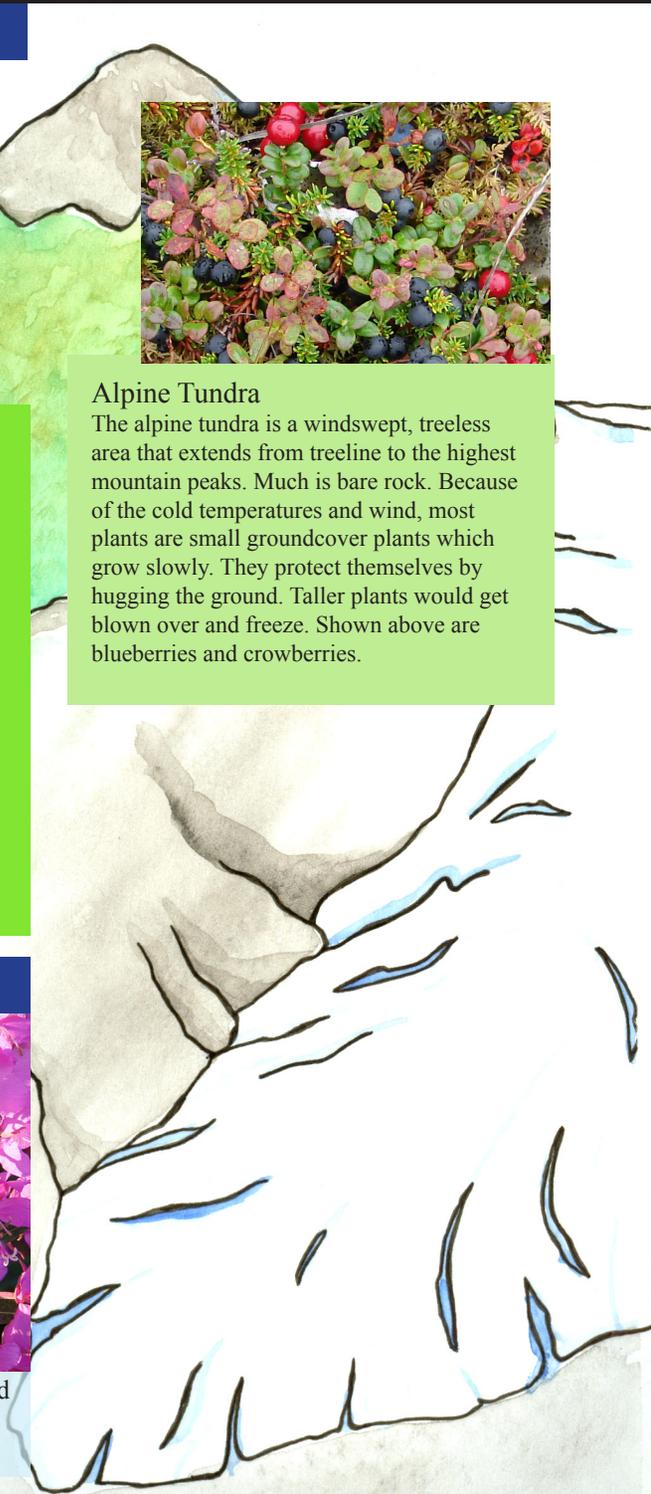
Just like in other areas of major areas of disturbance, like floods, fire and volcanoes, as the glacier recedes it reveals bare ground. This is a place of new beginning for plant life. The first plants to arrive are mosses and lichens whose spores are carried in on the wind. Lichens excrete an acid that slowly breaks down rock. Moss and lichens also increase the organic content of the glacial foregrounds, helping with soil building.

Pioneer plants, such as Dwarf Fireweed and Sitka Alder are the next to establish. Alder are able to move in because they are “nitrogen-fixers,” meaning that they do not need nutrients in the soil to obtain nitrates. Nitrate is the usable form of nitrogen it is what makes plants green. Alder has a symbiotic relationship with bacteria in its roots; the bacteria takes nitrogen from the air and turns it into nitrates for the plant. Dwarf Fireweed thrives due to the waxy coating on its leaf allowing it to withstand the constantly changing moisture of the area in front of the glacier called the Outwash Plain.

The shrub stage includes alder as well as Felt Leaf Willow. The submature stage occurs after a period of 50-100 years. A cottonwood forest develops with full growth alder and willow, as well as young spruce. After a period of 200 years, Sitka Spruce and Western Hemlock form a mature forest. The evergreens dominates the forest, depriving the cottonwoods of sunlight and nutrients.



fireweed



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Why is there ice here?

Kenai Fjords National Park is a land dominated by glaciers, massive rivers of ice that flow out from the Harding Icefield. Today nearly 56 percent of the park is covered in ice.

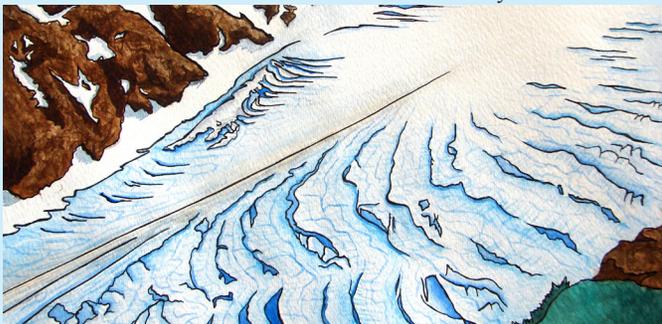
The formation of a glacier requires three conditions: lots of snow, cool summers, and gravity. All three conditions are met in Kenai Fjords.

Ice As Far as the Eye Can See

During the Pleistocene Epoch, the Harding Icefield was a small piece of the vast ice sheet that covered much of southcentral Alaska 23,000 years ago. The Harding Icefield is a remnant of the last ice age and accumulates snow in the winter, which feeds 38 glaciers.

The Gulf of Alaska is home to the semi-permanent Aleutian Low, a predictable area of low atmospheric pressure that generates much of the weather that soaks the rest of the US and Canada. The coastal mountains of Kenai Fjords acts as a wall, catching the clouds and the resultant snow. As snow accumulates, the snowflakes lose their delicate shape and air is squeezed out. The snow granules fuse together to form dense ice crystals weighing thousands of tons. Gravity works its magic on the ice and it slides down hill forming the moving rivers of ice we call glaciers.

illustration by Elise A. Kahl



Types of glaciers



Valley Glacier

A valley glacier is a large flowing river of ice that moves down through a valley under its own weight.

Exit Glacier is a valley glacier. It is the only glacier in the park that is accessible by land. Exit Glacier flows downward from the Harding Icefield approximately 10 inches a day. The glacier

reached its Little Ice Age maximum around 1815, and has been retreating since 1869. Between 1835 and 2005 the terminus, or face, has retreated over a mile and a quarter.

Tidewater Glacier

Tidewater glaciers are glaciers that flow into the sea. Tidewater glaciers end abruptly. The face of a tidewater glacier is constantly undercut by the sea causing large chunks of ice to calve off the glacier.



Beneath the water's surface, a stable glacier is fixed to its moraine.

illustrations by Chris Byrd



What is a fjord?

A fjord is a glacially carved, U-shaped valley that is now filled with sea water. A glacier acts as a giant bulldozer and transforms a V-shaped river valley into a glacially carved, U-shaped valley. As the glacier melts sea levels rise, the void is filled in with sea water, creating the fjords.



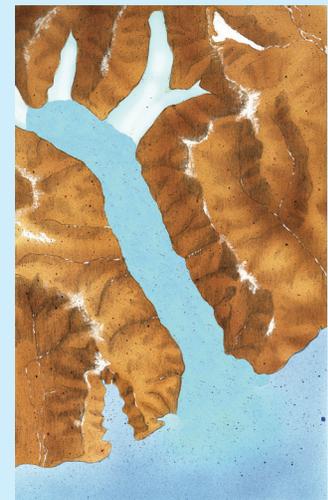
a. Snow accumulates and the glacier expands down the shallow valley



b. As the size and weight of the glacier increases, it carves out the valley



c. When the climate warms, the glacier retreats, leaving a deeper valley.



d. As sea levels rise, water floods the valley, stopping at the face of the glacier.



Are there earthquakes?



Yes, many earthquakes occur every day in Alaska, but most of them cannot be felt.

In 1964 the Great Alaska Earthquake was the largest earthquake in North America

and the second largest in recorded history. In Seward, a section of the waterfront slid into Resurrection Bay due to the earthquake shaking. This created a local tsunami causing much structural damage.

Leaked oil lit on fire and spread on the water. Twenty minutes after this happened, a large tsunami arrived from the ocean. Witnesses described the tsunami as a 25 foot wall of water that went inland as much as a mile.

The town of Seward now has a Tsunami Warning system to protect residents if this should ever happen again.



You and the National Parks

The National Park Service was created in 1916 to care for national parks, monuments, and other land set aside in the National Park system. The scenery, the natural and historic objects, and the wildlife in the parks are protected. National Parks are created for the enjoyment of the people, today and in the future.

Year after year, more and more people visit national parks. The National Park Service can preserve and protect these special places only with help from people like you!

When you visit parks, treat them gently. Carry your trash home with you and stay on trails. Don't feed or bother the wildlife. Leave your parks the way you found them so that others can enjoy them. Enjoy your parks and tell others about the cool things you saw and learned!

People in the Park

The first people to inhabit this area were the Alutiiq people, or Sugpiaq. They are a southern coastal people of the Yupik peoples of Alaska. Archaeological evidence and oral tradition shows that they have lived here for centuries.

In prehistoric times, the Alutiiq shared items of technology with other northern coastal peoples. They traditionally lived a seasonal, coastal lifestyle, subsisting on ocean resources such as salmon, seabird eggs, seal and whale.

They also took advantage of the rich land resources that include berries and land mammals. Throughout the seasons, camps were movable to follow the resources. The larger anyaq boat allowed village residents to pick up and move to different sites.

People of Russian descent settled this area in the late 1700s. In 1867 the United States purchased Alaska and further settled the area.

The coastal fishing communities of Nanwalek and Port Graham at the end of the Kenai Peninsula continue to be home for the descendants of the earlier Alutiiq people. During the land selection process of the Alaska Native



Claims Settlement Act (ANCSA) in 1971, both Port Graham Corporation and English Bay Native corporation chose ancestral lands within the boundaries of the park. Today, 42,000 acres within the park is Native Land.



Environmental Concerns

Marine Debris

Marine debris is any man-made object that is discarded or abandoned that enters the coastal or marine environment. The debris may be from a ship, or may be carried by rivers or storm drains. Debris materials include plastic, glass, metal, styrofoam, rubber, and fishing gear. While these items can be broken down into smaller and smaller fragments, they generally do not biodegrade entirely. Volunteers from the Seward community participate in annual beach cleanups.

Exxon Valdez Oil Spill

At 12:04AM on March 24th, 1989, the oil tanker Exxon Valdez ran aground on a reef in the Prince William Sound. 257,000 barrels of oil spilled (125 olympic-sized swimming pools) into the water. The oil impacted 1,300 miles of shoreline and on April 10th the oil reached Kenai Fjords National Park.

Thousands of seabirds, sea otters and other marine mammals were killed. A bird cleaning station in Seward washed thousands of birds while thousands of workers and volunteers partook in beach cleanups. Oil from the spill can still be found on the beaches, but it underneath rocks and hidden from view.

Climate Change

Glaciers are an interconnected part of our natural ecosystem in Alaska. Warmer temperatures, due to human-caused increases in carbon dioxide emissions, are one of the causes of glacier melt. There are great photos available of our disappearing glaciers at www.oceanalaska.org - look for the repeat glacier photography.

Humans can help! By decreasing our carbon dioxide emissions, we may be able to slow the rate of global warming. For more information, search the web for information on climate change.

More Info

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