

Glaciers

Glaciers are thick masses of ice on land. The ice has built up from many seasons of snowfall. Glaciers move downhill very slowly. Glaciers:

1. cover 10 percent of the world's land
2. are smaller, today, than they used to be because of climate change
3. sometimes look pink because of the algae living in the top layers of the snow and ice
4. store 75 percent of the world's fresh water and provide water for many people around the world
5. change the land they flow through, carving landscapes with their weight.



Muir Glacier in Alaska, like many glaciers, has changed through time. At left, the glacier in 1941; at right, the glacier in 2004; from the [NSIDC photo pairs collection](#).

For details on glaciers, see [All About Glaciers](#).

Ice shelves and icebergs

Ice shelves are platforms of ice that form where ice sheets and glaciers move out into the oceans. Ice shelves exist mostly in Antarctica and Greenland, as well as in the Arctic near Canada and Alaska. Icebergs are chunks of ice that break off glaciers and ice shelves and drift in the oceans. Ice shelves and icebergs:

1. raise sea level only when they first leave land and push into the water, but not when they melt in the water
2. break off and melt as temperatures rise; in 2002, Antarctica's huge Larsen B Ice Shelf shattered in only a few months, sending hundreds of icebergs into the ocean
3. provide shelter for krill, small fish that penguins, seals, whales, and sea birds eat
4. are one important area of study for a wide range of scientists who study biology, glaciers, climate, and other fields
5. may hold clues to the future of ice sheets and glaciers in a world with warming temperatures.



This iceberg was photographed near Antarctica during the [NSIDC IceTrek expedition](#).
[High-resolution image](#)

For more information on ice shelves and icebergs, see [Quick Facts on Ice Shelves](#) and [Quick Facts on Icebergs](#). For advanced information, see [The State of the Cryosphere: Ice Shelves](#). For information on the Larsen B breakup, see [Larsen Ice Shelf Breakup Events](#).

Frozen ground

Frozen ground is soil or rock in which part or all of the water has frozen. If the ground is frozen all year long, we call it "permafrost," or permanently frozen ground. Frozen ground:

1. exists mostly in the Arctic and Antarctic, but frozen ground can also be found at high elevations
2. has begun to melt as climate warms
3. often has an "active layer" near the surface, where plants can live because the soil is thawed for at least part of the year
4. creates problems for people who are building structures, roads, or dams because it can shift them when it melts
5. stores greenhouse gases like carbon and methane; scientists are studying how these gases will affect climate as temperatures warm and permafrost thaws.



Melting permafrost beneath this building in Dawson, Yukon, is making the building tip.

—Image from University of Iowa Geoscience Slides Collection

[High-resolution image](#)

For more information on permafrost, see [All About Frozen Ground](#). To find out how climate change is affecting frozen ground, see [The State of the Cryosphere: Permafrost](#).