Glaciers Ice on the Move

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hat is large and cold and can last for thousands of years? If you said a **glacier**, then you would be correct. However, this may not always be true. Scientists are seeing differences in the amount of ice on Earth's surface and in how fast glaciers are shrinking.



1987

earth observatory for kids

2013

2018

There are nearly 200,000 glaciers on Earth, and it would be difficult to go out and study each one. This is why satellite views are so important. These side-by-side views, taken by Landsat satellites, show Yakutat Glacier in Alaska over the years. Yakutat Glacier is shrinking as it retreats.

Vocabulary:

glacier – Slow-moving compacted snow. Glaciers are usually found on mountains or in the polar regions.

ice field - A vast area of land covered by interconnected glaciers

snow line – The elevation at which snow cover will remain all year without melting.

Take Yakutat Glacier in Alaska as an example. Between 2010 and 2018, this glacier retreated 45 square kilometers (17 square miles). That is an area of ice loss equal to the area of 25,000 Olympic-sized ice skating rinks. Yakutat is one of the fastest retreating glaciers in the world.

In the past, Yakutat was a part of an **ice field** that has since separated into several smaller glaciers. Without this connection to a larger source of ice, it is harder for Yakutat to maintain its size.

Why is Yakutat Glader shrinking?

With less ice flowing into it and not enough snow falling on it, Yakutat is no longer growing. But that's not all: Air temperatures have also been rising.

From 1948 to 2000, average annual air temperatures in Yakutat rose by 1.38 degrees Celsius (2.48 degrees Fahrenheit). Between 2000 and 2010, they went up another 0.48° C (0.86° F).

Those few degrees may not seem like much, but small changes in average temperature can have a big impact on Earth. A cooling of just 1 or 2 degrees Celsius (2-3°F) in the 1600s and 1700s caused the Earth to experience the "Little Ice Age." Growing and melting are a part of a glacier's life cycle. However, higher temperatures are causing Yakutat and other glaciers to shrink much faster than they can grow.



Matanuska is the largest glacier in the United States that is accessible by car. It is located 2.5 hours east of Anchorage, Alaska.

That's a lot of icel

- 8 million Glacial ice forms in some of the coldest places on Earth and can last for a very long time. The oldest glacier in the world is more than 8 million years old.
- **100,000** Yakutat is one of about 100,000 glaciers in Alaska.
- **91%** Antarctica is home to most of the glacial ice on Earth a whopping 91%.
- **3/4** About 75% (3/4) of the Earth's fresh water is stored in glacial ice.



Types of Cladars

Glaciers are found on just about every continent on Earth. They can cover large areas or mountain and volcano peaks.

Alpine glaciers flow down one or several mountain peaks.

Tidewater glaciers flow down from mountains into lakes or oceans.

Ice sheets, also called continental glaciers, can cover entire continents like Antarctica or Greenland.

DIY Science Rivers of Ice

ce moves downhill, thanks to gravity. And because of this, glaciers slowly flow from where they start. Glaciers flow about 0.3 to 1meter (1-3 feet) each and every day. Lots of glaciers begin high up on a mountain and then flow down into a valley, lake, or ocean. As they flow, they carve the landscape and displace rocks and sediment along the way.

Make your own mountain glacier out of sand, cornstarch, and water and watch it flow.

Try it:

Build a minimountain out of wet sand and place it on the paper plate. Set aside.







What you need:

- cups
- spoons
- sand
- paper plate
- freezer bag
- plastic gloves
- 1 cup water
- 2 cups corn starch
- blue food coloring

- 2 In two separate cups, mix corn starch and water. The gooey mixture should be thick enough to form into solid balls. In one of the cups, dye the mixture blue with the food coloring.
 - Keep adding balls and watch them weigh each other down and flow.





How Slow Can it Go?

Why not set up a slow motion camera and see how slow this glacier could flow. Also, let the glacier stand for a couple of days and you will see **moraines** form on the edges of the "glacier." Cracking and **calving** may take place as well.





When outlet glaciers from an ice sheet meet the ocean, they can calve and produce large icebergs. This 185-square-kilometer iceberg, named B-46, broke off the Pine Island Glacier on Antarctica.

Glaciers are often called "rivers of ice" because they are constantly changing and flowing.

Vocabulary:

moraine – An accumulation of rocks or sediment that has been dropped or moved by a glacier.

calving – When a glacier breaks off into the water. A calved piece of glacier is called an iceberg.

Cool Blue

Glacial ice is somewhat different than the ice you find in your freezer. Glaciers are made of layers upon layers of snow. Over time, these layers press down on each other. They also melt and refreeze to create super-compacted ice that can be blue in color.

Image by Ashley Haubenschild