

Reflect

Have you ever wondered from where your next drink of water will come? Most likely, you have never thought about it. It is easy to grab a glass and fill it up at the sink or the fridge. Drinking fountains are found in almost every hallway of your school, and taking a shower is probably a daily task for you.



Despite the fact that the majority of Earth is covered with water, many places face water shortages.

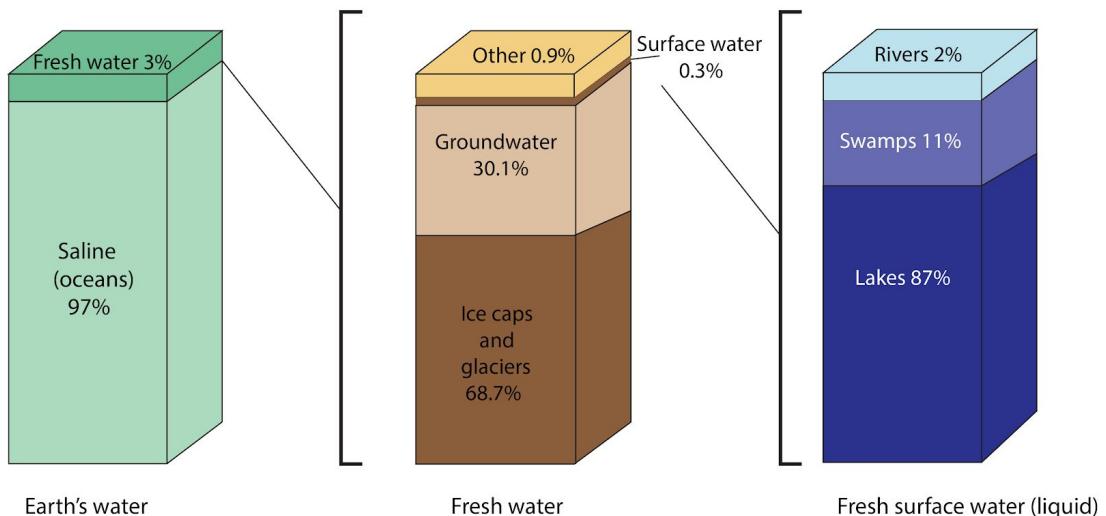


Parts of our world are not as fortunate. South Africa is facing a water shortage crisis due to climate change and weather patterns. A shortage of fresh water can lead to diseases and economic problems.

Where can we find water on Earth?

Almost 71% of Earth's surface is covered in water. It is in oceans, lakes, rivers, streams, glaciers, and ice caps. It is in our bodies, in animals, in plants, and in foods. With so much water available, it seems that no one should face a shortage! However, the large majority of water on Earth is not safe for drinking. Look at the different sources that make up Earth's water supply. There are two different types of water—fresh water and saline water (or salt water).

Distribution of Earth's Water



From US Geological Survey

What Do You Think?

Look at the following table that further shows how water is distributed on Earth, then answer the questions below.

Water Source	Water Volume (km ³)	Percentage of Total Water
Oceans and seas	1,338,000,000	96.5%
Glaciers and ice caps	24,064,000	1.74%
Groundwater	23,400,000	1.7%
Permafrost	300,000	0.02%
Lakes	176,400	0.01%
Soil moisture	16,500	0.001%
Atmosphere	12,900	0.001%
Wetlands	11,470	0.001%
Rivers	2,120	0.0002%
Biological	1,120	0.0001%
TOTALS	1,386,000,000	100%

Questions:

- Make a bar graph, using each category listed in the table to show how water is distributed on Earth.
- Does the data surprise you? Why?
- Does the information change the way you think about water usage? How?

Reflect

Fresh water is classified as water having less than 0.1% salt concentration. Of the fresh water on Earth, 70% is in the form of glaciers and ice caps. About 30% of fresh water is groundwater. Fresh water that is surface water is what organisms use to meet their needs. It is used for drinking, transportation, heating and cooling, industry, recreation, and other purposes. We use fresh water for many things. It is important for us to be mindful of how much we use. We need to conserve our freshwater supply.

Salt Water

Of Earth's water, 97% is salt water. Most of the salt water is found in the oceans, all of which are connected. They cover about 70% of Earth's surface. Some salt water exists in the form of saltwater lakes, such as the Great Salt Lake in Utah and many lakes in China. Although salt water provides a habitat for many marine organisms, we cannot drink it.



Nearly three-quarters of earth's surface is covered in water. Salt water is 97% of that. Only 3% is fresh water.

What Do You Think?

Because 97% of Earth's water is salt water and undrinkable, many people have attempted to find ways to turn ocean water into drinking water. Scientists call this process *desalination*.

Look at the example below of machinery used for the desalination of water, then answer the questions about it.



A desalination plant takes salt water and removes the salt and other minerals to make the water potable (drinkable) for people and animals.

Questions:

- Based on what you know about the evaporation of seawater, how do you think desalination works?
- What are some benefits of building desalination plants?
- What are some drawbacks of building desalination plants?
- Where on Earth should these plants be built?

Reflect

Fresh Water

Although 3% of Earth's water is fresh water, a large percentage of that water is actually unusable. Look back at the water distribution data. What do you notice about the freshwater portion of Earth's water supply?

Ice

Almost 69% of fresh water on Earth is stored in the form of ice caps and glaciers. The continent of Antarctica and the island of Greenland are large land areas that are almost completely covered with ice. Water locked up in glaciers and ice caps cannot be used by humans as a drinking water supply. However, that water still plays an important role in the scientific world. Scientists monitor climate change and its effects on our world by observing these large areas of ice.



The majority of fresh water is frozen in glaciers and polar ice caps.



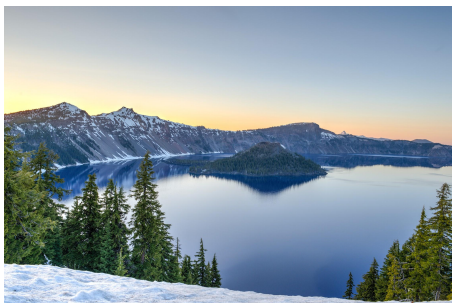
aquifer – a body of rock that can hold water underground and that allows water to flow through it

Groundwater

Of the fresh water on Earth, 30% exists as groundwater. Groundwater is any water that lies underneath the surface of the land. Groundwater is essential to life on Earth and is an important part of the water cycle. A lot of precipitation that falls to Earth soaks into the soil and trickles through the ground until it collects in **aquifers**. Aquifers are used as sources of drinking water for people and animals. Farmers use aquifers to water their crops.

Surface Water

The remaining 0.3% of Earth's fresh water is surface water. Surface water is any water on top of the land. Most of this water is in the form of lakes, rivers, and marshes. *Lakes* are bodies of water that are completely surrounded by land and not connected to an ocean. Most lakes have rivers connected to them that allow water to move in and out. *Rivers* are natural, flowing sources of water. Rivers move from higher elevations to lower elevations. Smaller rivers act as tributaries to larger rivers. Most larger rivers eventually empty into larger bodies of water, such as oceans or lakes. Smaller rivers may be called *brooks*, *creeks*, or *streams*. *Marshes*, or *wetlands*, are shallow areas where land and water meet. A wetland is flooded the majority of the time.



Lakes are large bodies of fresh water.



Rivers are another example of freshwater surface water.



Wetlands are important because they filter, clean, and store water.

Water in the Atmosphere

A small percentage of water is always present in the atmosphere. Water evaporates when it has enough energy to leave its liquid form and become a gas called *water vapor*. The warmer the air is, the easier it is for available water to evaporate. When water vapor cools, it condenses back into liquid form or solid form and eventually falls out of the sky as precipitation. This is part of the water cycle. There will always be water in the atmosphere in the form of a solid, liquid, or gas, due to the water cycle.



How is water present in the atmosphere as a solid, a liquid, and a gas?

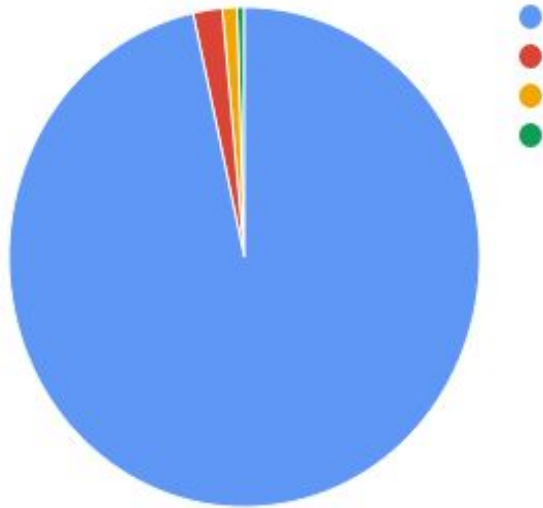
What Do You Think?

Using the information you read about and the percentages that were given in the text, label the pie chart to accurately describe the distribution of Earth's water. Be sure to look back and include the percentages in your pie chart.

Label:

- Surface Water
- Ice Caps and Glaciers
- Groundwater
- Salt Water

Distribution of Water on Earth



Questions:

If there is no way to increase the amount of fresh water here on Earth, what are some ways in which we can conserve the fresh water we do have?

Do you think we will ever run out of fresh water? Why?

What do you think would happen to our planet and the organisms living here if we ran out of fresh water?