

# Intro to Oceans



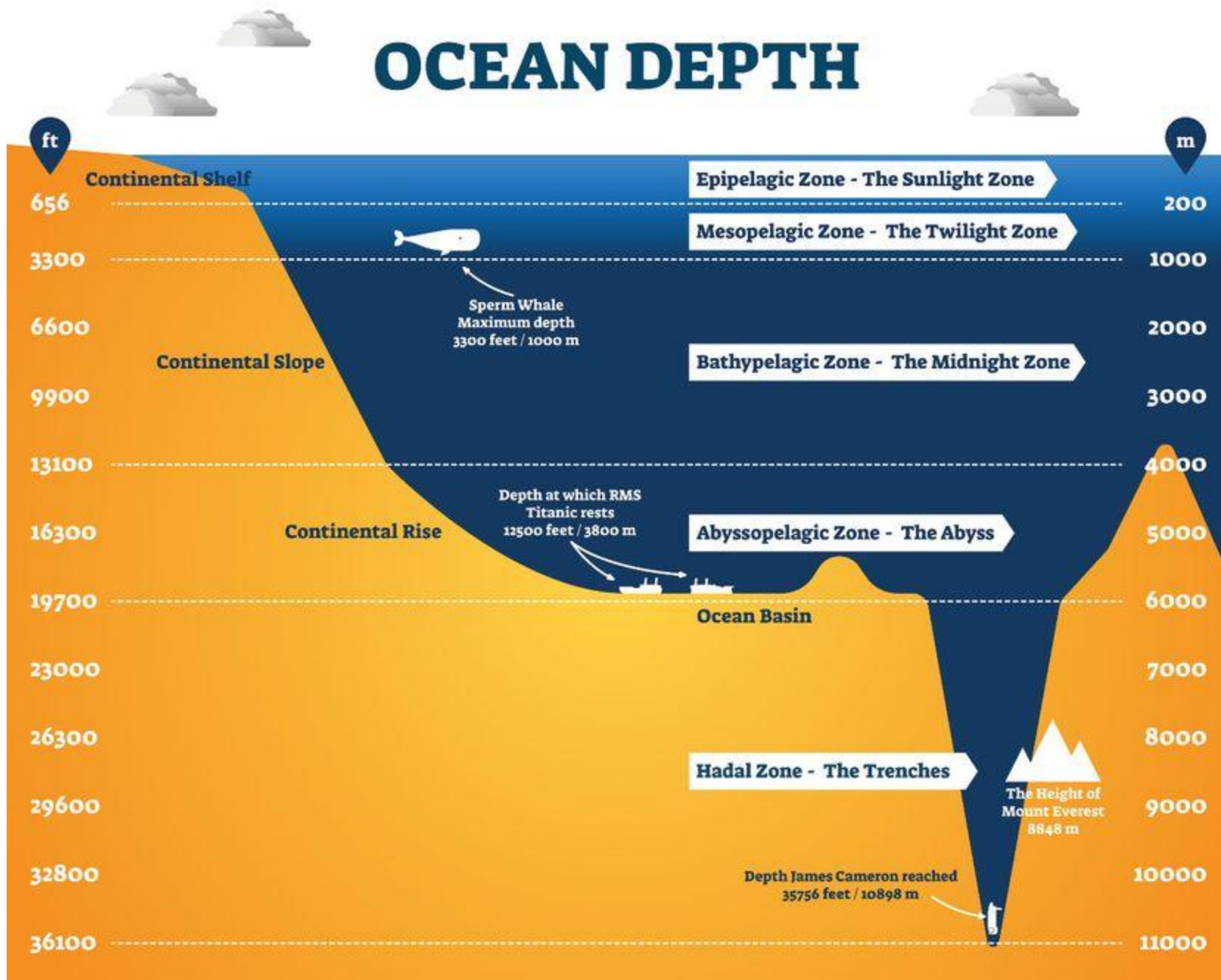
# All over the Earth's Surface

- **Size:** The ocean covers 71% of the Earth's surface, and contains over 99% of the planet's living space.



# How deep is the ocean?

- **Depth:** The average depth of the ocean is about 12,100 feet, but the deepest part of the ocean is the Mariana Trench, which is over seven miles deep.



# Longest Mountain Range

- The planet's longest mountain range is underwater and is 10 times longer than the Andes. Above water, the Andes mountain range is only about 4,300 miles long, while underwater, the Mid-Oceanic Ridge mountain range is around 40,390 miles long.



- **Oxygen:** The ocean produces over 50-80% of the oxygen we breathe. The ocean produces oxygen primarily through the process of photosynthesis by microscopic marine organisms called phytoplankton, which use sunlight, carbon dioxide, and water to create energy and release oxygen as a byproduct; essentially, most of the oxygen produced in the ocean comes from these tiny plants floating near the surface where sunlight can reach them, contributing to a significant portion of the Earth's atmospheric oxygen.





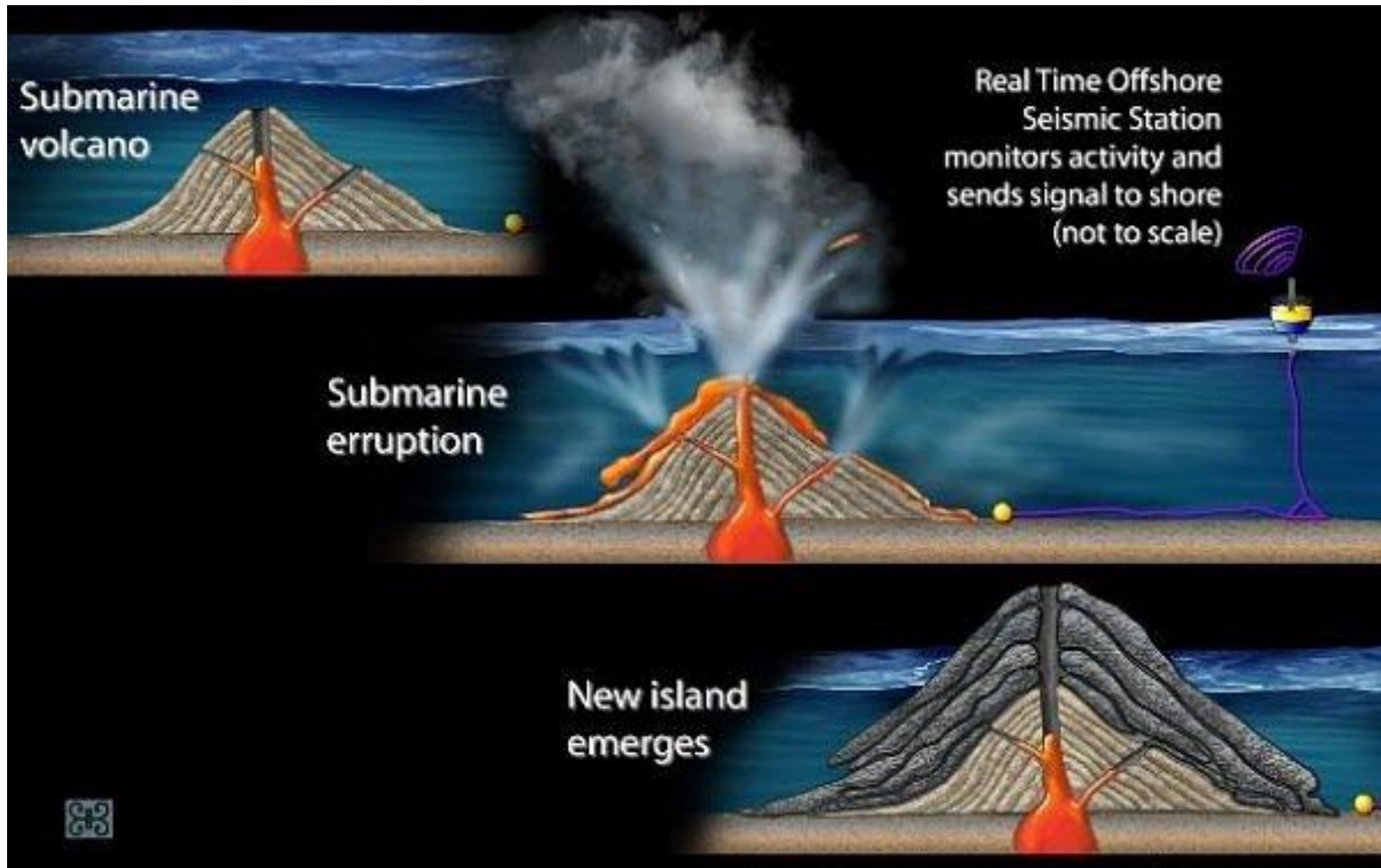
- **Volcanoes:** Around 80% of the planet's volcanic eruptions happen underwater.

Submarine volcano

Real Time Offshore Seismic Station monitors activity and sends signal to shore (not to scale)

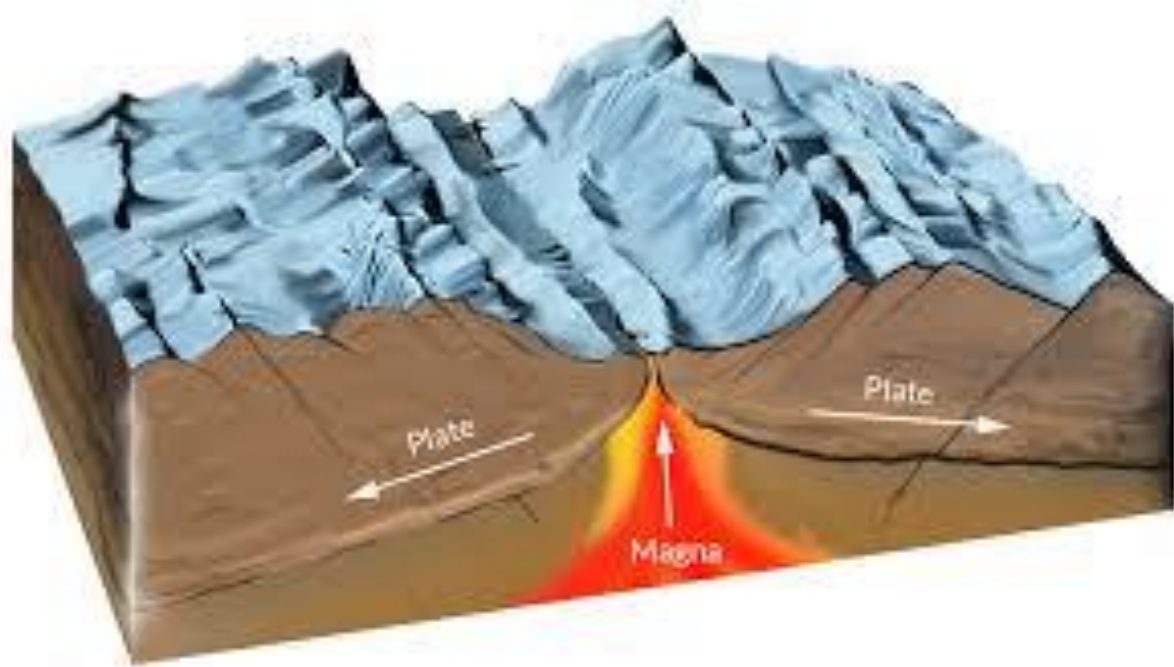
Submarine eruption

New island emerges

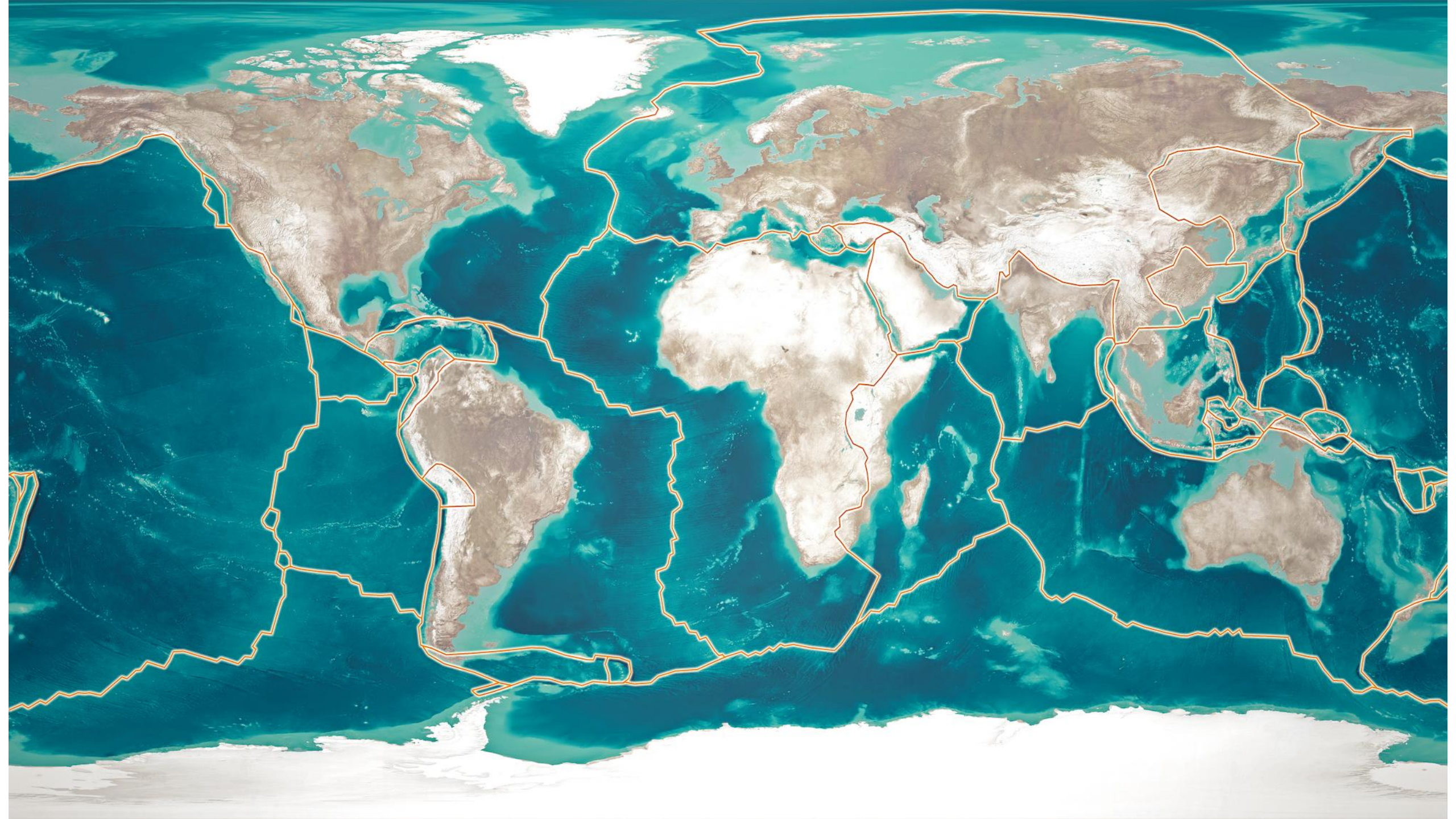


# Movement

- Movement: The ocean floor is moving, and sea level and the amount of water in the ocean change over time.







# We are used to Volcanos outside



STUNNING Drone Video of ICELAND VOLCANO Eruption | 4K DJI FPV

A view from a spacecraft window showing a large, bright blue cloud over a dark Earth surface. The spacecraft's metallic structure is visible on the left side.

**ON THE PHONE...**

**Joseph Resing**

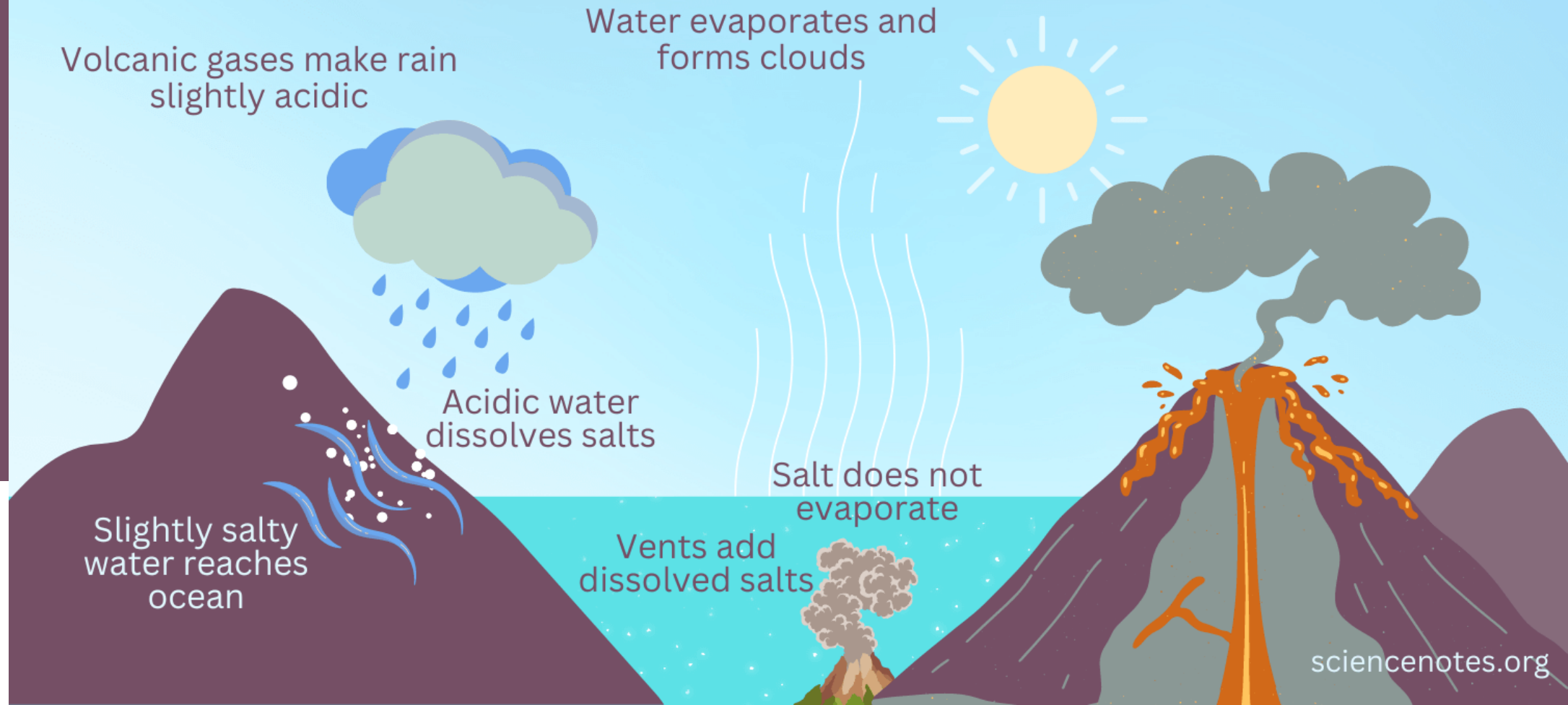
Joint Inst. for the Study of the Atmosphere and Ocean  
University of Washington

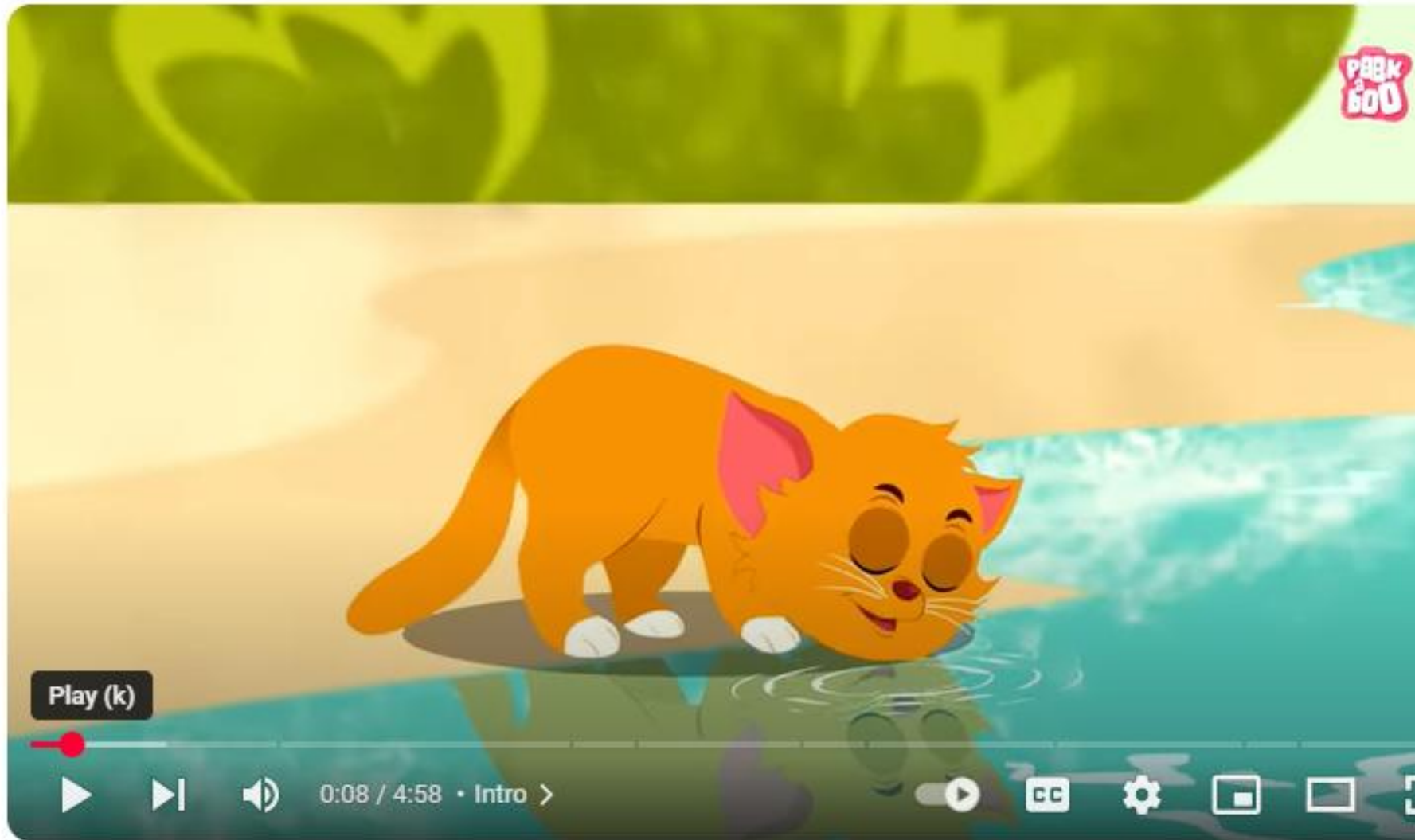


# Why Is the Ocean Salty?

The ocean is salty because dissolved minerals (salts) reach the ocean and accumulate.

- The ocean is salty because of runoff from land and openings in the seafloor.
- There is enough salt in the ocean to cover the whole surface of the Earth.





**Why Is Ocean Water Salty? | Earth's Ocean | Dr Binocs Show | Peekaboo Kidz**

# Unknown Species

- Species:  
Around 91% of ocean species remain undiscovered. The number of species that live in the ocean is unknown.



# OUR WORLD OCEAN

## provides

### CLIMATE REGULATION

**70%** Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.



### ECONOMY

**\$282 billion** Amount the U.S. ocean economy produces in goods and services. Ocean-dependent businesses employ almost 3 million people.



### TRANSPORTATION

**76%** Percent of all U.S. trade involving some form of marine transportation.



### RECREATION

From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.



### FOOD

The ocean provides much more than just seafood. Ingredients from the sea are found in surprising foods such as peanut butter and soymilk.



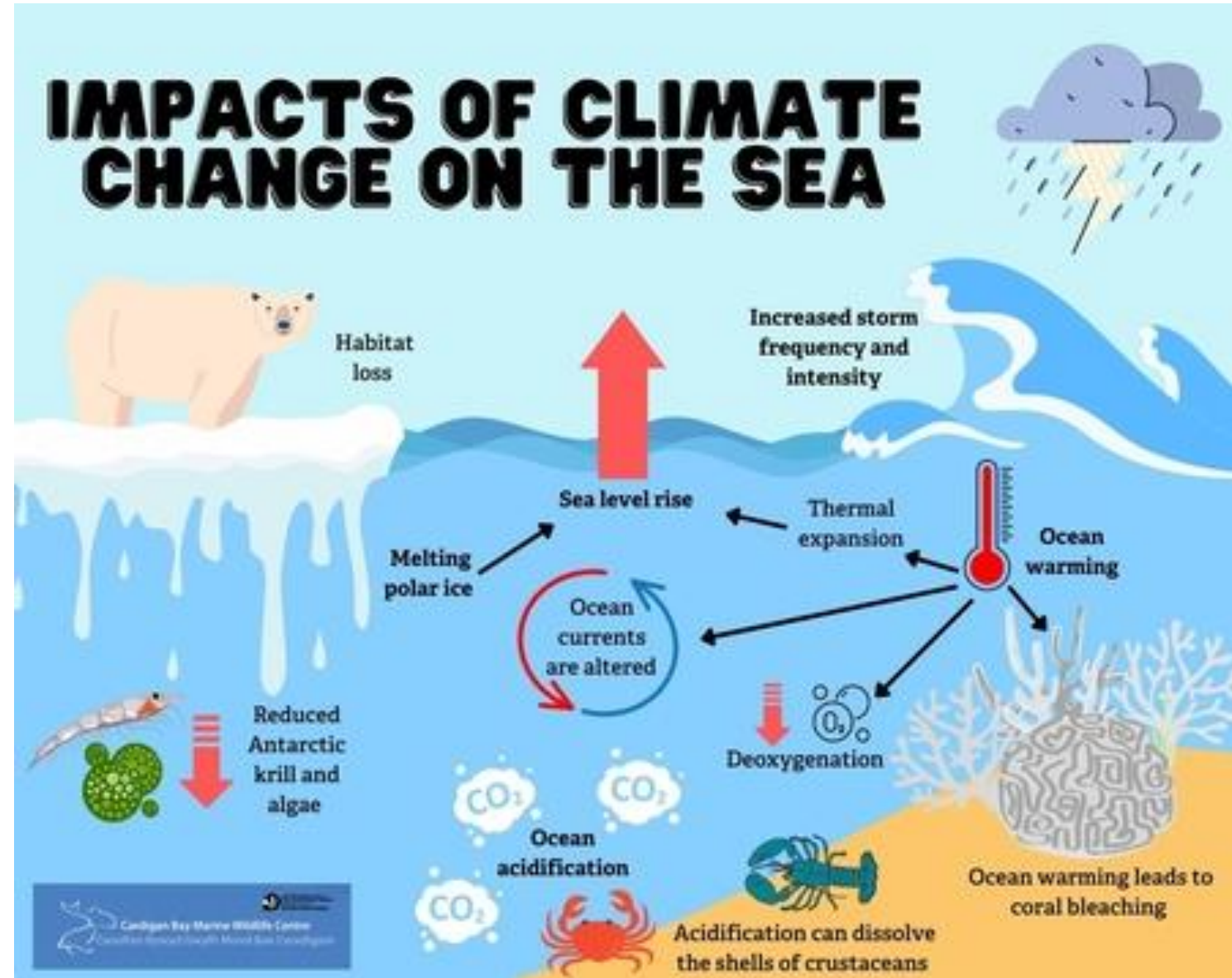
### MEDICINE

Many medicinal products come from the ocean, including ingredients that help fight cancer, arthritis, Alzheimer's disease, and heart disease.

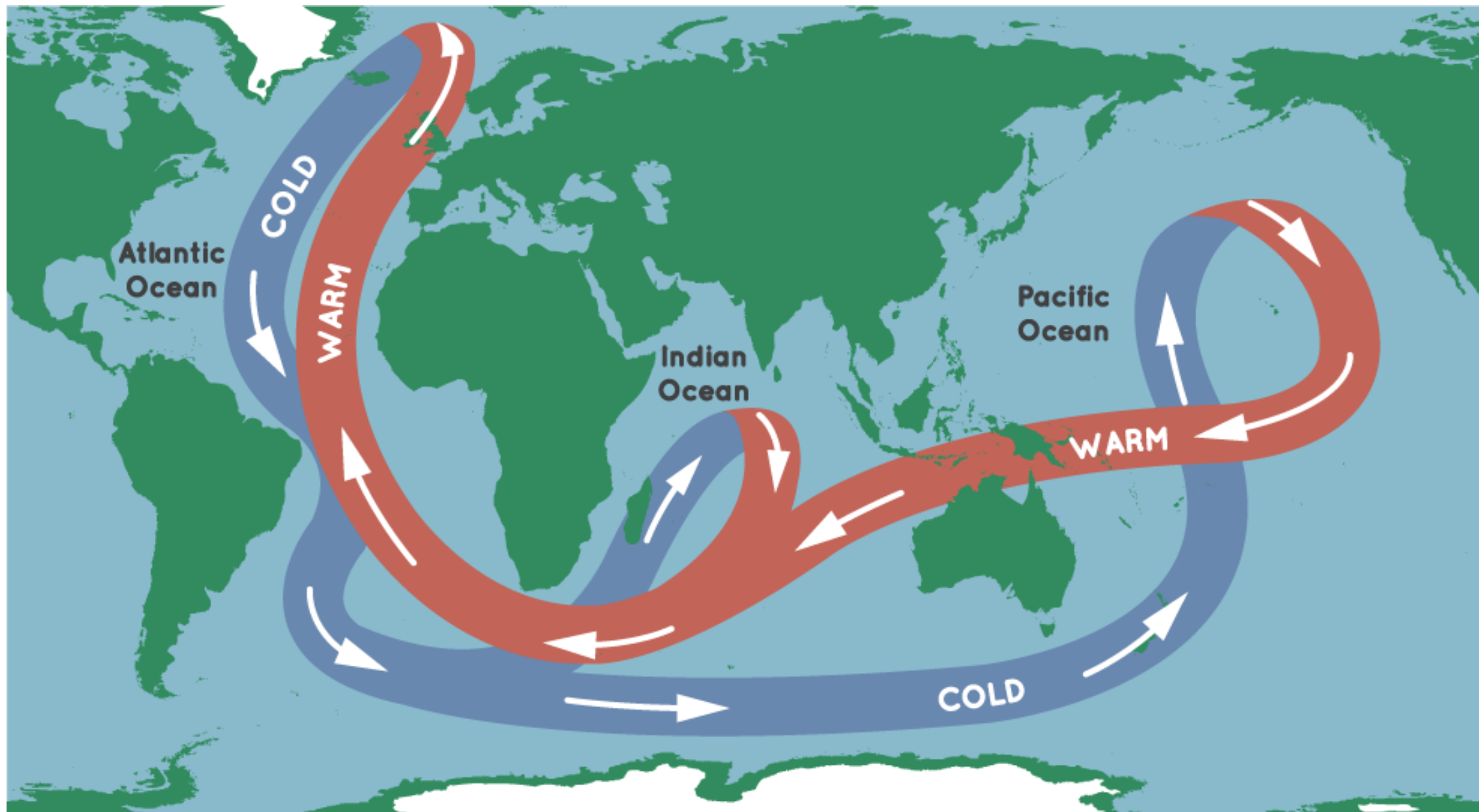


# Important Part of our Climate

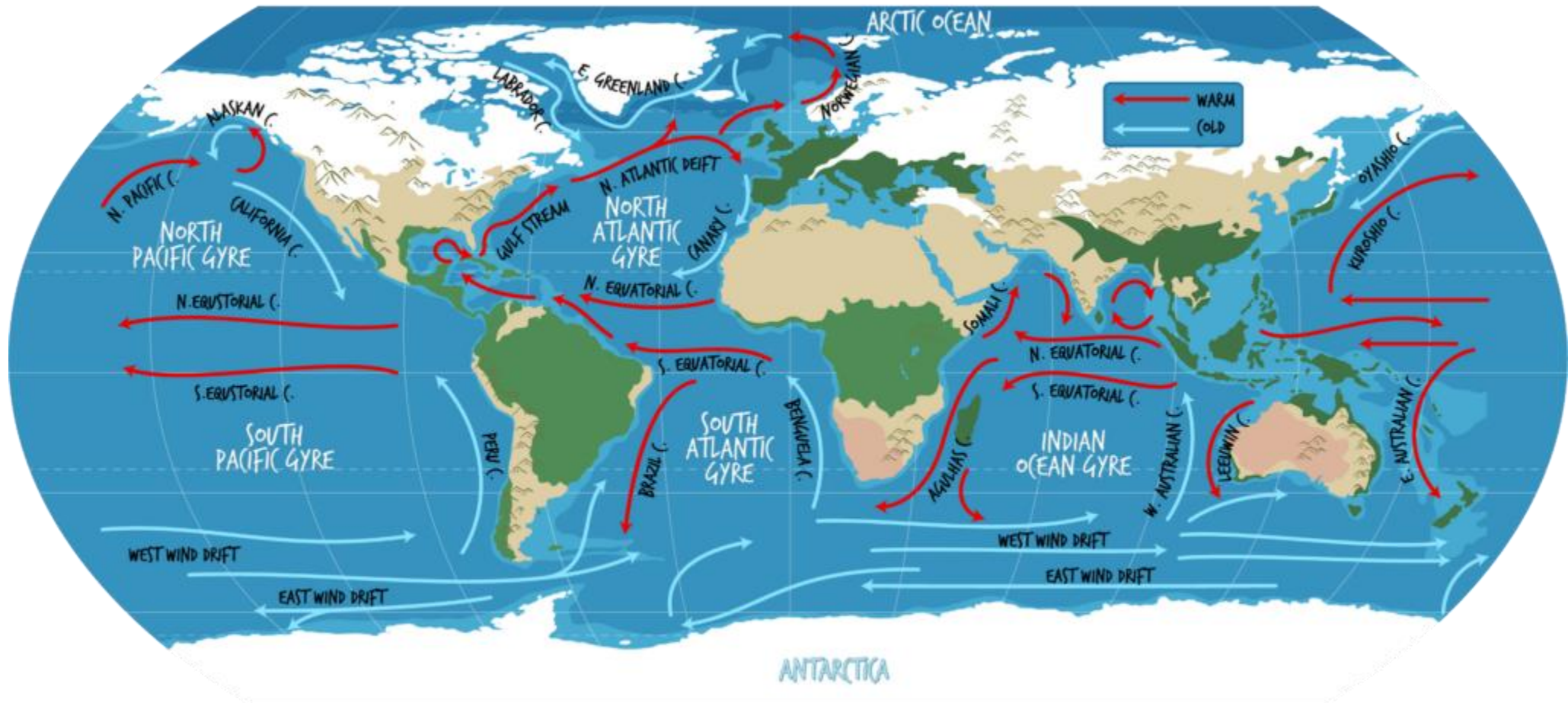
- Climate: The ocean influences and regulates Earth's climate.



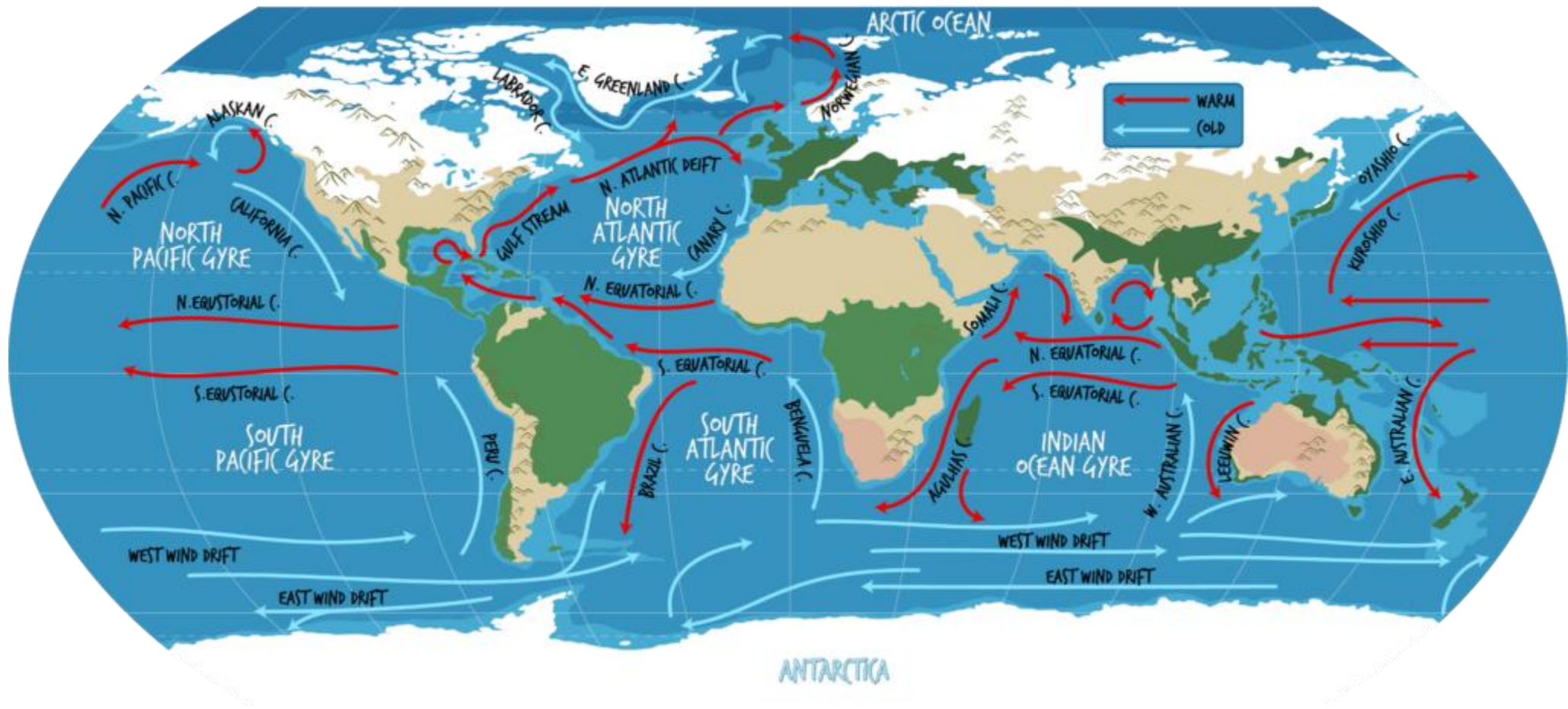




# Ocean Currents

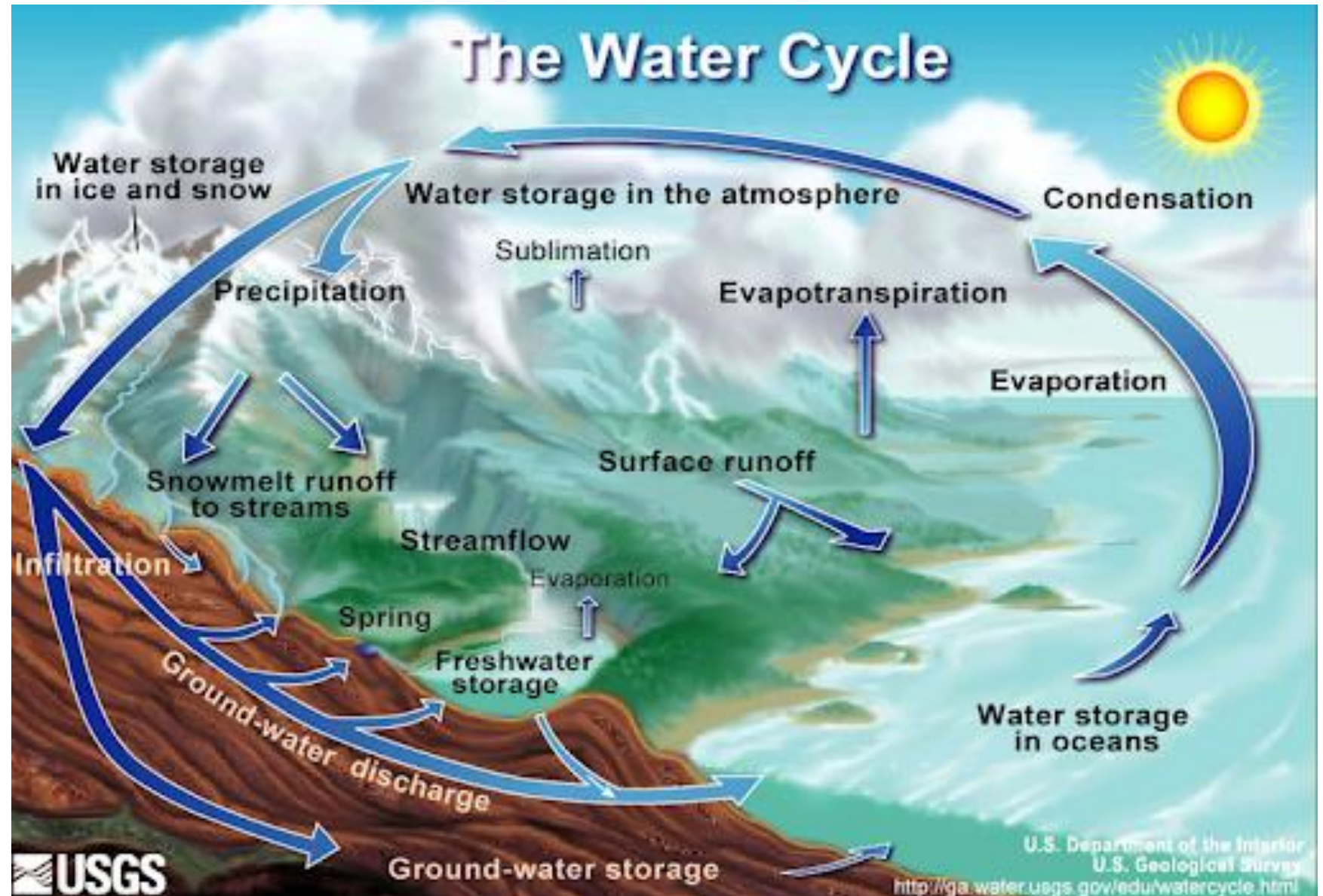


As the horizontal currents are moving south or northwards. They move water at temperatures at odds with the air above. This displaced water affects the air, by warming or cooling it. Thereby transferring the same effect to the land when the air blows across it. This is how ocean currents affect climate. Currents travel thousands of kilometers. Establishing a global conveyor belt that brings about different climatic conditions across the world.



- The atmosphere receives much of its heat from the ocean. As the sun warms the water, the ocean transfers heat to the atmosphere. In turn, the atmosphere distributes the heat around the globe.

- Because water absorbs and loses heat more slowly than land masses, the ocean helps balance global temperatures by absorbing heat in the summer and releasing it in the winter. Without the ocean to help regulate global temperatures, Earth's climate would be bitterly cold.



# Ocean Currents

- Deep, cold currents transport oxygen to organisms throughout the ocean. They also carry rich supplies of nutrients that all living things need. The nutrients come from plankton and the remains of other organisms that drift down and decay on the ocean floor.





# Plates are Moving

- Tectonic plates: The Atlantic Ocean grows 1.5 inches wider every year because the tectonic plates undergirding the Americas are separating from those beneath Europe and Africa.

# Causes of Local Sea Level Change

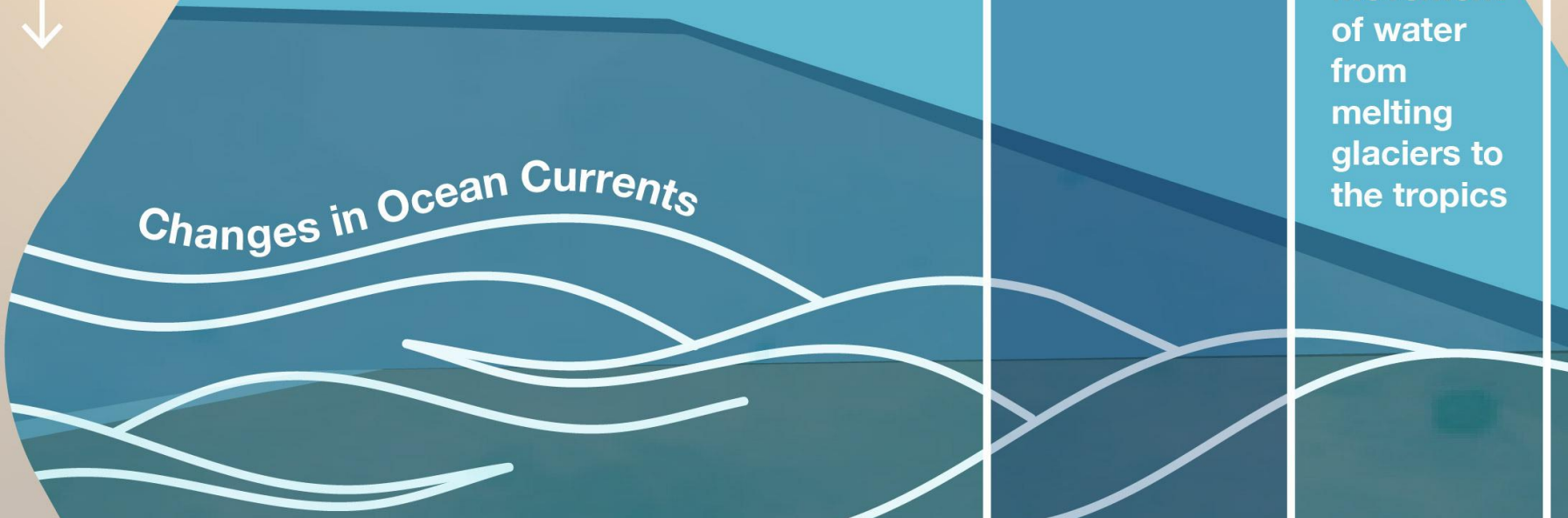
Vertical Land Motion



Global Sea Level Rise



Changes in Ocean Currents



Temporary Shifts from Tides, Storms, and Other Natural Changes (e.g. El Niño)

Movement of water from melting glaciers to the tropics



# Why are they blue?

- Why are our oceans blue? Water absorbs the red light of the color spectrum, leaving the blue for us to see.



Why is the ocean blue? | [#aumsum](#) [#kids](#) [#science](#) [#education](#) [#children](#)



# Hearing Under Water

- Sound travels underwater 4.3x faster compared to air – this makes determining direction of sound near impossible for divers.



The clicking of snapping shrimp are often a sound of a healthy reef

# Shipwrecks

- There are more historic artefacts under the sea than in all of the world's museums. Around 1,000 shipwrecks lie off the Florida Keys alone, some of which are within the Florida Keys National Marine Sanctuary. Other underwater museums have been created in recent years, including the Mediterranean's submerged bronze statue, Christ of the Abyss.

