## Oceans Impact on Climate

The **sun** is Earth's main source of energy.

Solar energy is absorbed by both oceans and continents.

BUT--because the oceans cover over 70% of Earth's surface and are darker than the continents--they absorb more of the sun's energy.

Oceans store and transport heat energy impacting climates.

This energy is transported by ocean currents.

## Ocean Currents

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- a stream-like movement of ocean water.

The sun is responsible for creating ocean currents. These ocean current impacts the climate as they move from warm regions (equator) towards the poles.

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Without oceans, Earth's summers would be much warmer and winters would be much colder.

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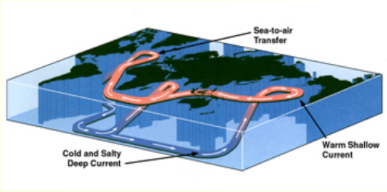
## Convection




Warm water rises and cold water sinks

## Factors that affect the direction ocean currents move:

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1. Trade winds - winds that blow across the ocean's surface determines a current's direction.

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2. Coriolos effect- earth spins counter-clockwise causing the ocean's currents to travel in a curved path.

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3. Continental deflection - when an ocean current hits a land mass, the current changes directions because of the land.

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## Ocean currents move as gyres, which are large, rotating systems of ocean currents.

There are five major **ocean-wide gyres** — the North Atlantic, South Atlantic, North Pacific, South Pacific, and Indian Ocean gyres

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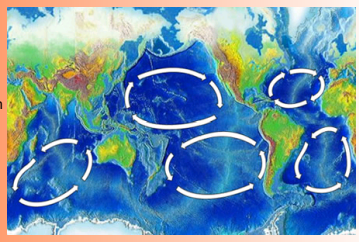

**Gyres** are caused by the Coriolis effect and wind currents that result from the friction caused by the Earth's rotation.

## Two Types of Ocean Currents:

Deep currents - movement of water far below the surface of the ocean that are caused by changes in density.

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Density of ocean water changes in 2 ways:

1. Changes in temperature - colder water has more density and will sink.
2. Changes in salinity - the more salt in the water the greater the density.

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2. Surface currents - movement of ocean water on or near the surface of the ocean that are responsible for the climate in many parts of the world.

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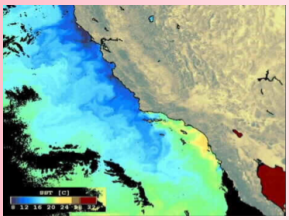

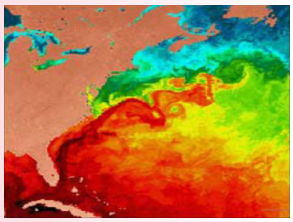

## 2 types of surface currents:

1. Warm-water currents - form near the equator and travel toward the poles creating a warmer climate near the coastlines it travels by.

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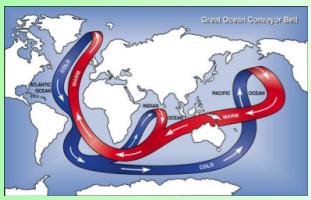


2. Cold-water currents - form near the poles and travel toward the equator creating a cooler climate near the coastlines it travels by.

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