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Ocean Currents

Ocean Currents



OCEAN CURRENTS

Ocean Currents

Ocean Currents



Vocabulary

- Ocean Current
 - Coriolis Effect
 - Upwelling
- 

Major Ocean Currents

- An **Ocean Current** is a large volume of water flowing in a certain direction.
- Wind-driven currents are called surface currents.
- Surface currents carry warm or cold water horizontally across the ocean's surface



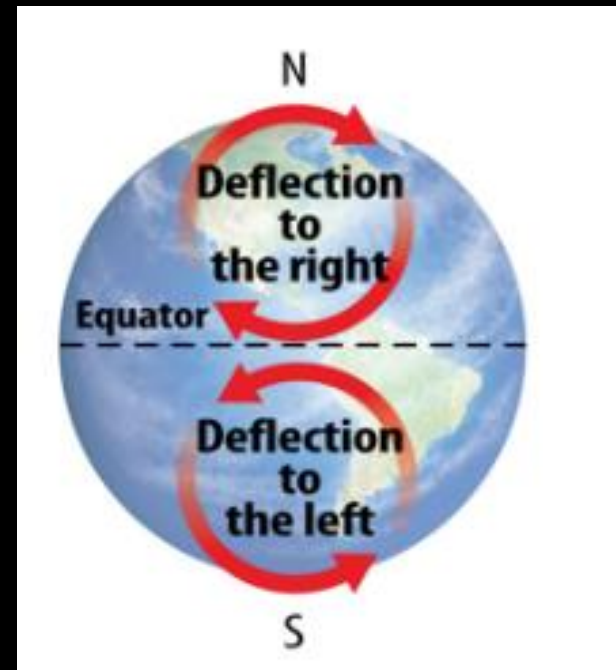
Major Ocean Currents



- Surface currents extend to about 400 m below the surface, and they move as fast as 100 km/day.
- Earth's major wind belts, called prevailing winds, influence the formation of ocean currents and the direction they move.

Coriolis Effect

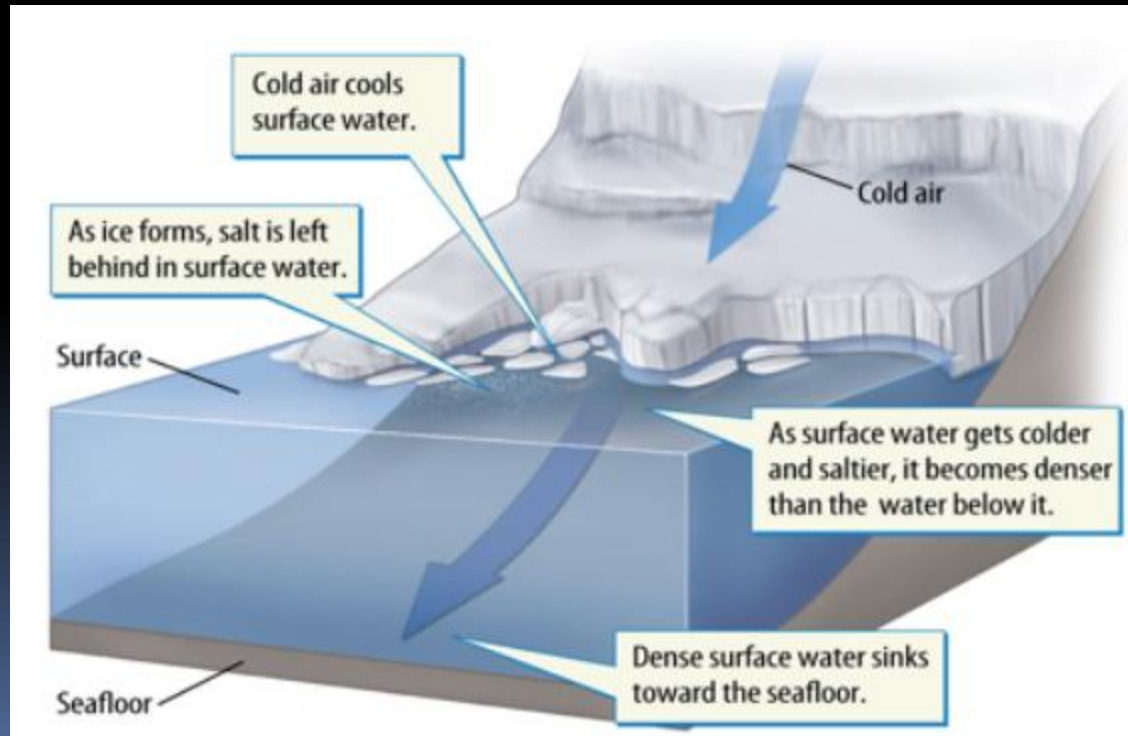
- The **Coriolis Effect** is the movement of wind and water to the right or left that is caused by Earth's rotation.
- It causes fluids such as air and water to curve to the right in the Northern hemisphere, in a clockwise direction.



- The Coriolis effect also causes fluids to curve to the left in the southern hemisphere, in a counterclockwise direction.

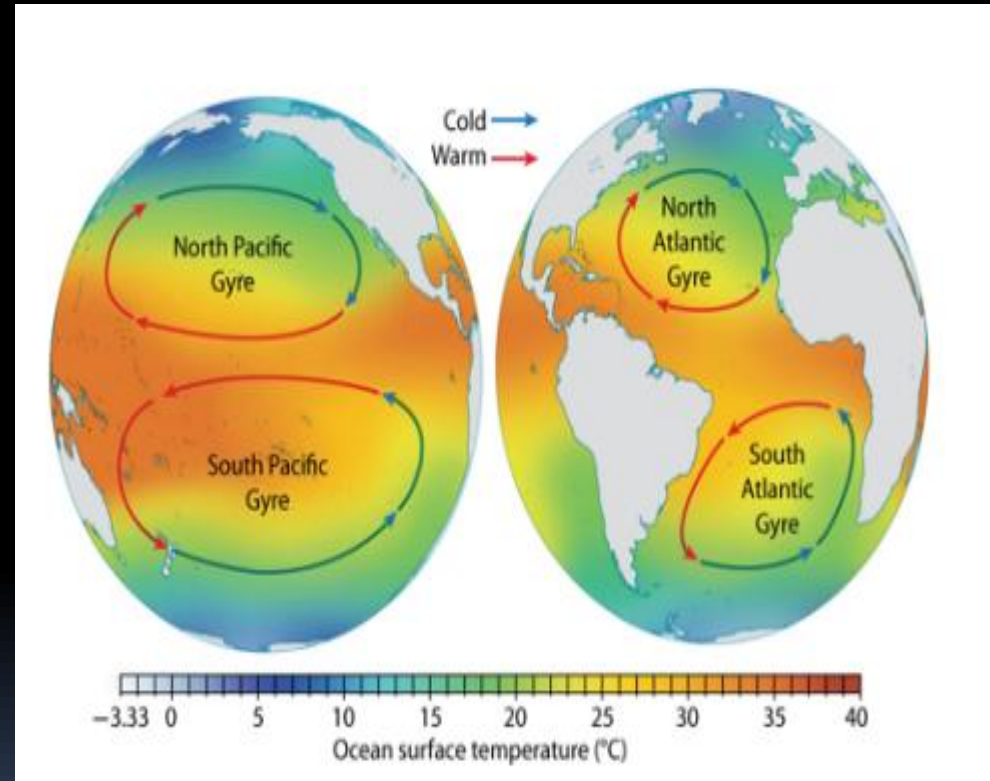
Density Currents

- **Density Currents** are a type of vertical current that carries water from the surface to deeper parts of the ocean.
- Density Currents are caused by changes in density rather than wind.
- Density currents circulate thermal energy, nutrients and gases.



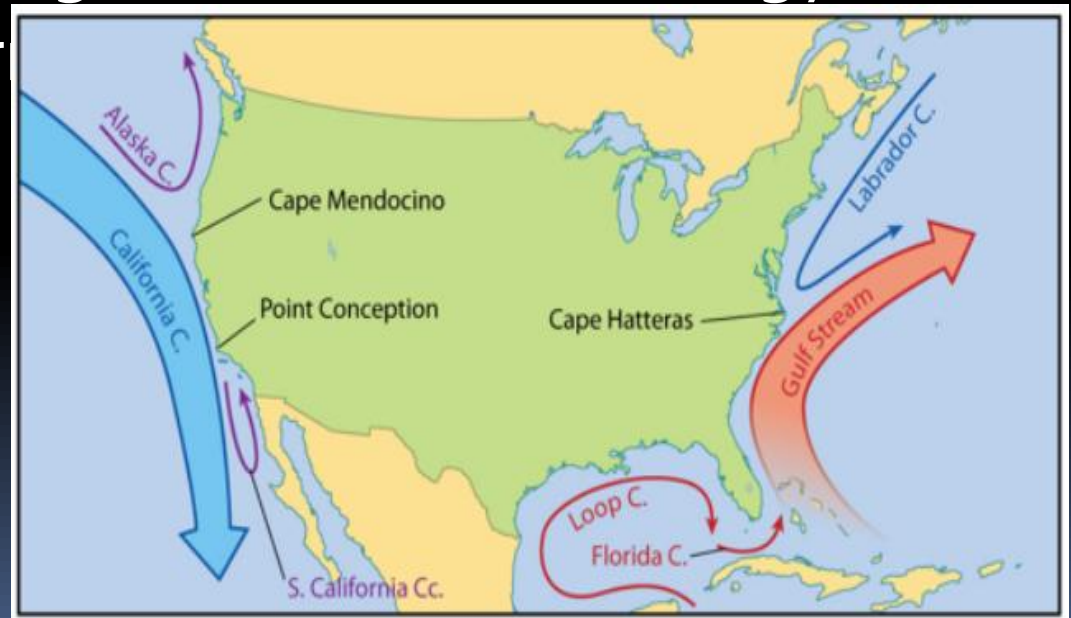
Impacts of Weather and Climate

- Warm-water currents and cold-water currents affect weather and climate in different ways
- Regions near warm-water currents are often warmer and wetter than regions near cold-water currents



Impacts on Weather and Climate

- The Gulf Stream is a warm-water current that affects coastal areas of the southwestern United States by transferring lots of thermal energy and moisture to the surface.
- The cold California Current affects coastal areas of the southwestern United States.

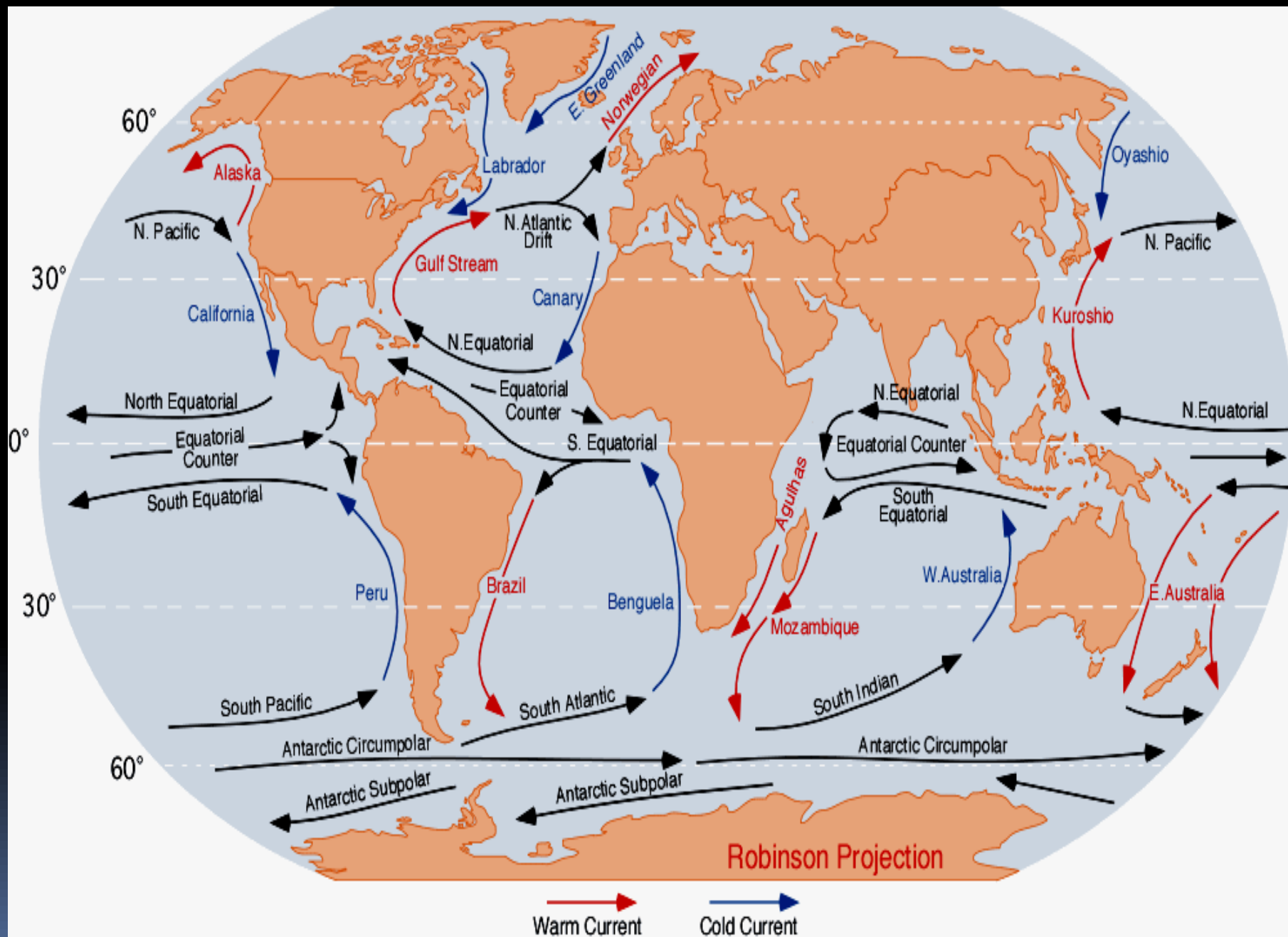




OCEAN CURRENTS

Ocean Currents

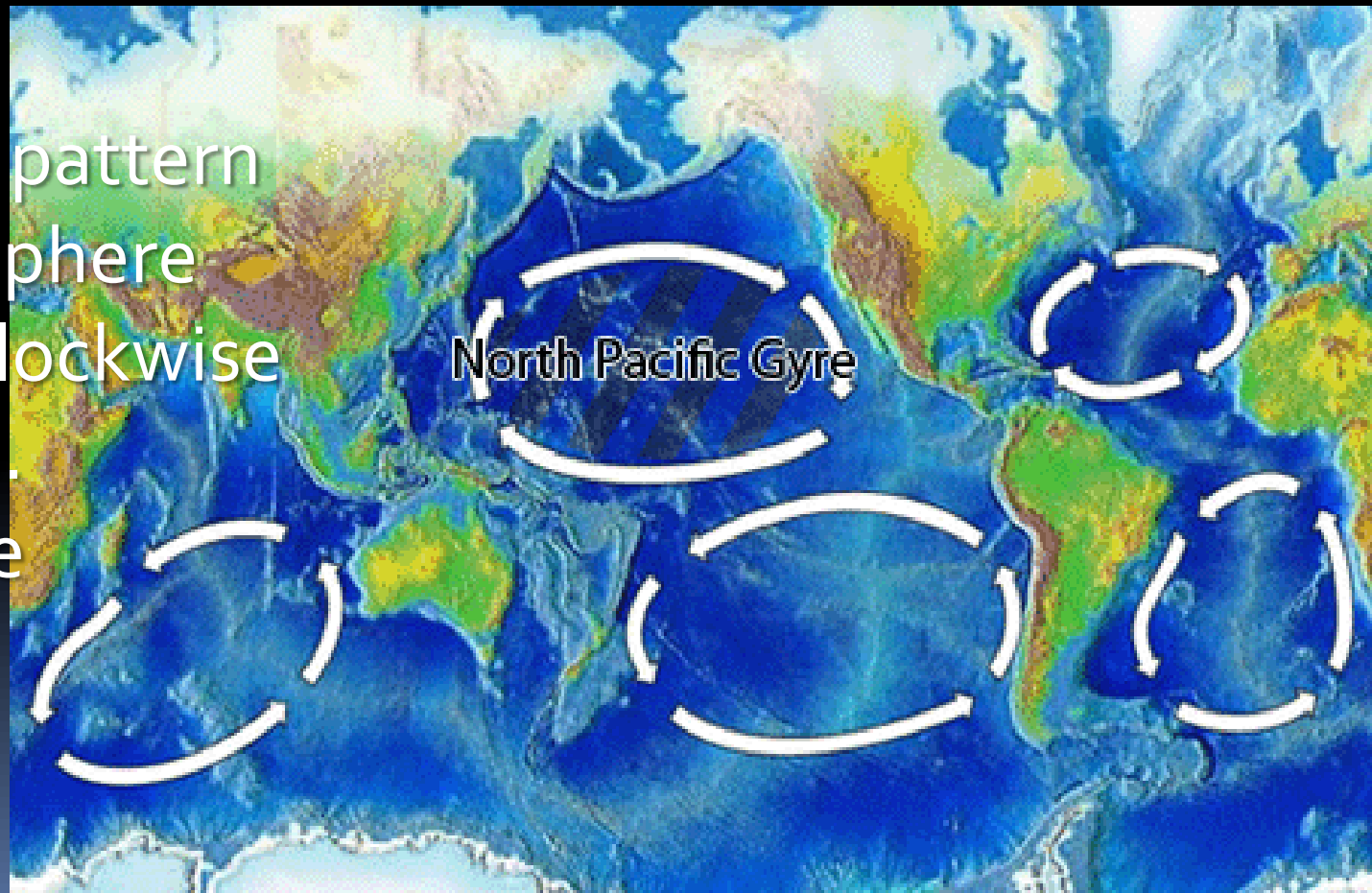
- Mass movement or flow of ocean water
- River within the ocean (“Conveyor Belt”)
- Two types
 - Surface
 - Deep (or Subsurface)



Ocean Currents Vocabulary

Nearly closed current system in the open ocean

- Clockwise pattern in N. Hemisphere
- Counter-clockwise pattern in S. Hemisphere



Surface Current [Link](#)

- Horizontal, stream-like movements of water that occur at or near the surface of the ocean
- Can reach depths of several hundred meters



Surface Currents continued..

- Controlled by three factors
 - Global winds
 - Coriolis Effect
 - Continental Deflections
- 

Surface Currents continued...

- Global Winds
 - Cause surface currents to flow in the direction the wind is blowing
- Coriolis Effect
- Apparent curving of moving objects (ie- Water) due to the Earth's rotation

Surface Currents continued..

- Coriolis Effect
 - Northern Hemisphere = clockwise
 - Southern Hemisphere = counter clockwise
- Continental Deflections
 - Shape of continents change the direction of current flow

Deep Currents

- Stream like movement of ocean water far below the surface
- Caused by changes in density
 - Change in temperature
 - Change in salinity

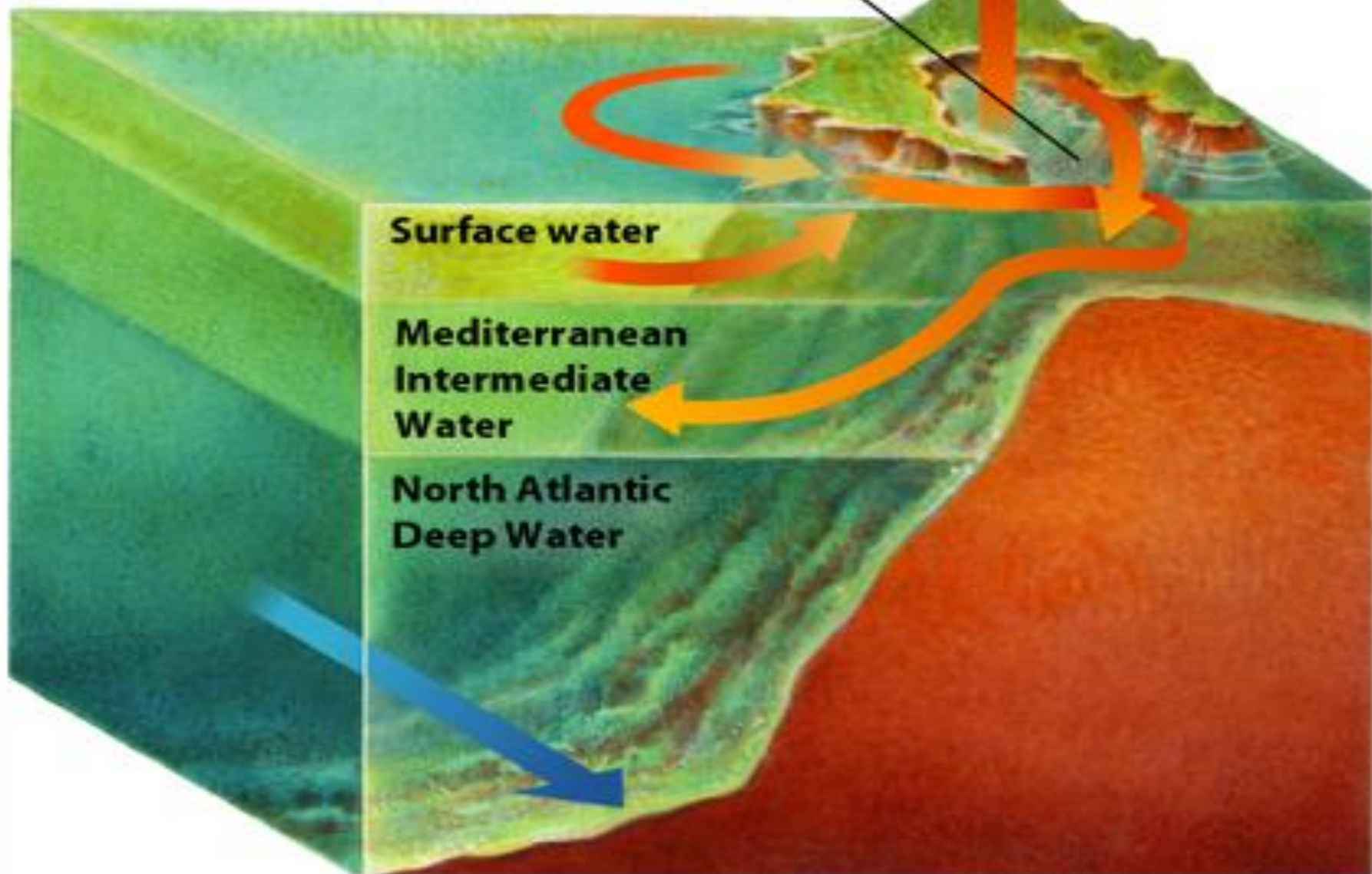
Mediterranean Sea

Evaporation

Surface water

Mediterranean Intermediate Water

North Atlantic Deep Water



Deep Currents continued...

- Change in temperature
 - ▣ Decreasing the temperature of water increases density
- Change in salinity
 - ▣ Increasing the salinity of water increases density

Surface currents and climate

- Warm water currents
 - On the east coasts of continents
 - Bring warm water to colder regions



Surface currents and climate

- Cold water currents
 - On the west coasts of continents
 - Bring cold water to warmer regions
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REFERENCES

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THANKS FOR WATCHING