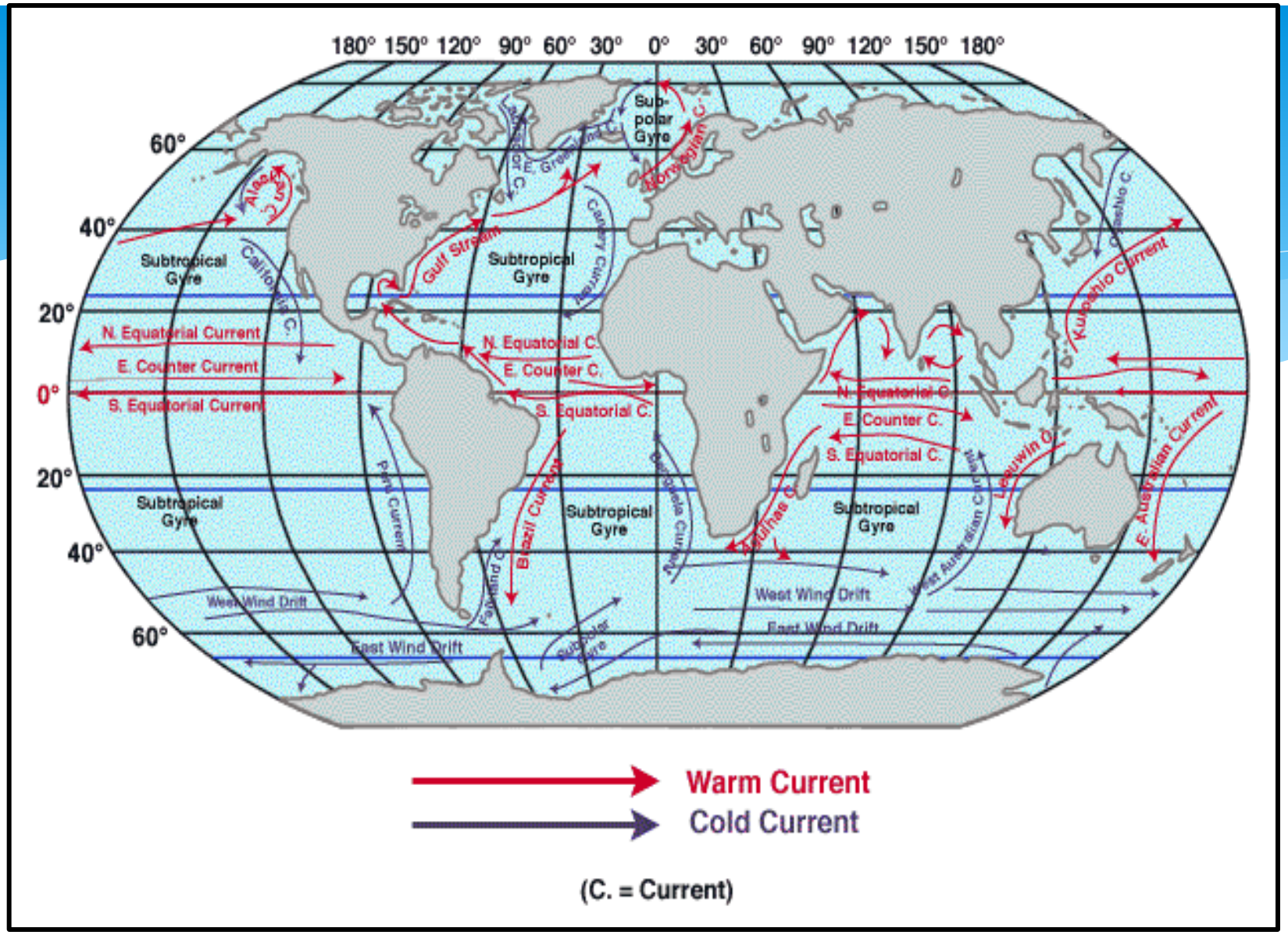
Currents

Motion in the Ocean

Currents

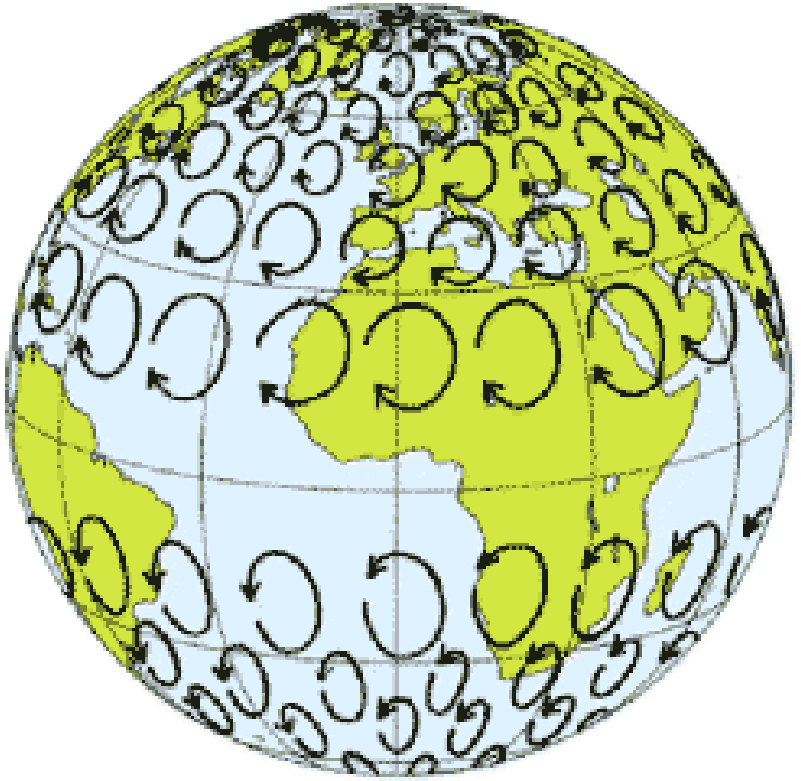
- “rivers” or “highways” of moving water in oceans.
- Move between continents, landmass to landmass.
- **Current** = a large mass of continuously moving ocean water.



Largest currents are called global ocean currents.

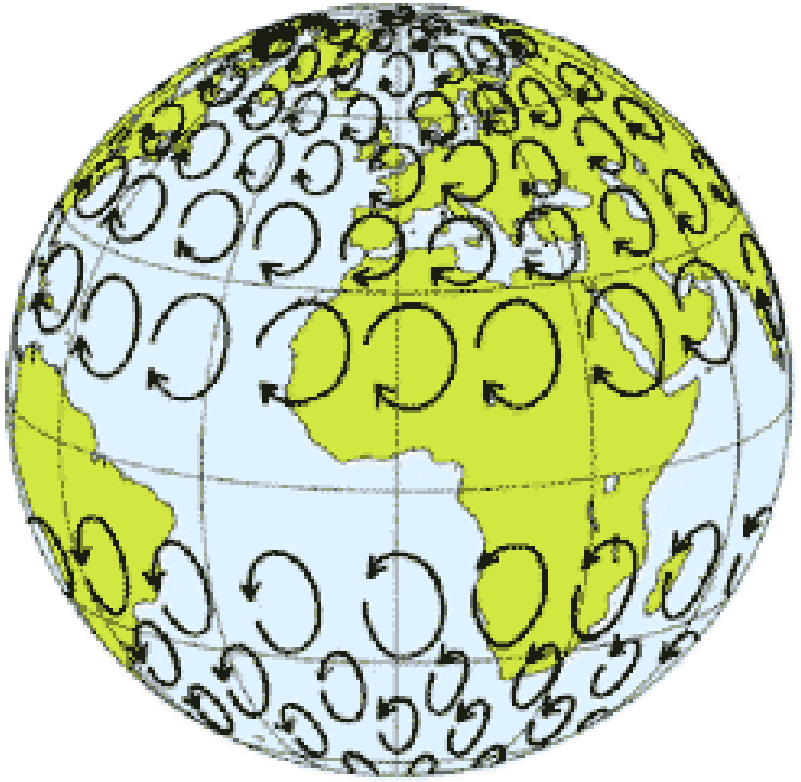
Surface Currents

- Earth is round, rotating – anything moving over its surface will bend slightly.
- The spinning Earth drives the movement of winds and surface waters.
- **Coriolis Effect**: the deflection (bending) of large-scale motions (wind, currents).
- https://www.youtube.com/watch?v=i2mec3vgeaI
  - **Northern** Hemisphere: clockwise
  - **Southern** Hemisphere: counter clockwise



Surface Currents

- **Coriolis Effect**: the deflection (bending) of large-scale motions (wind, currents).
- Trade winds: approach equator and bend away.
  - Equator is warmer than the poles: most of the sun's energy is absorbed here.
  - Warming air becomes less dense and rises – cooler air replaces that air = wind.

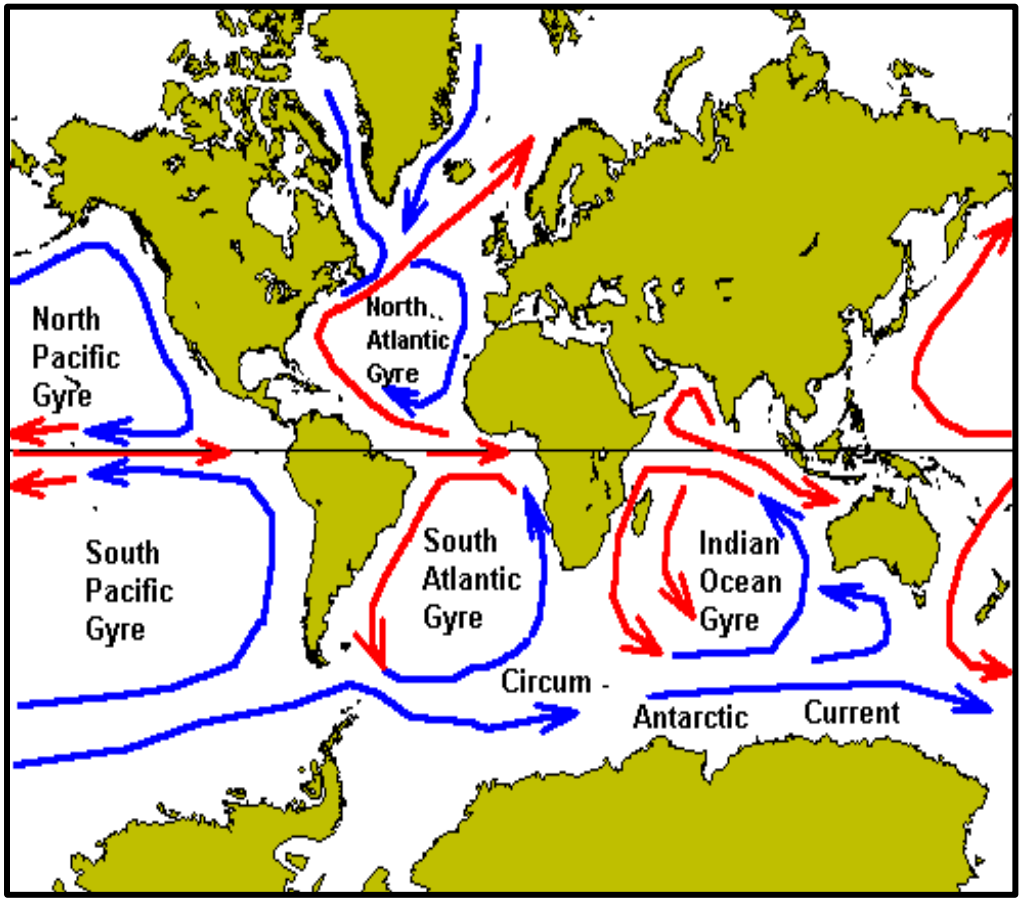


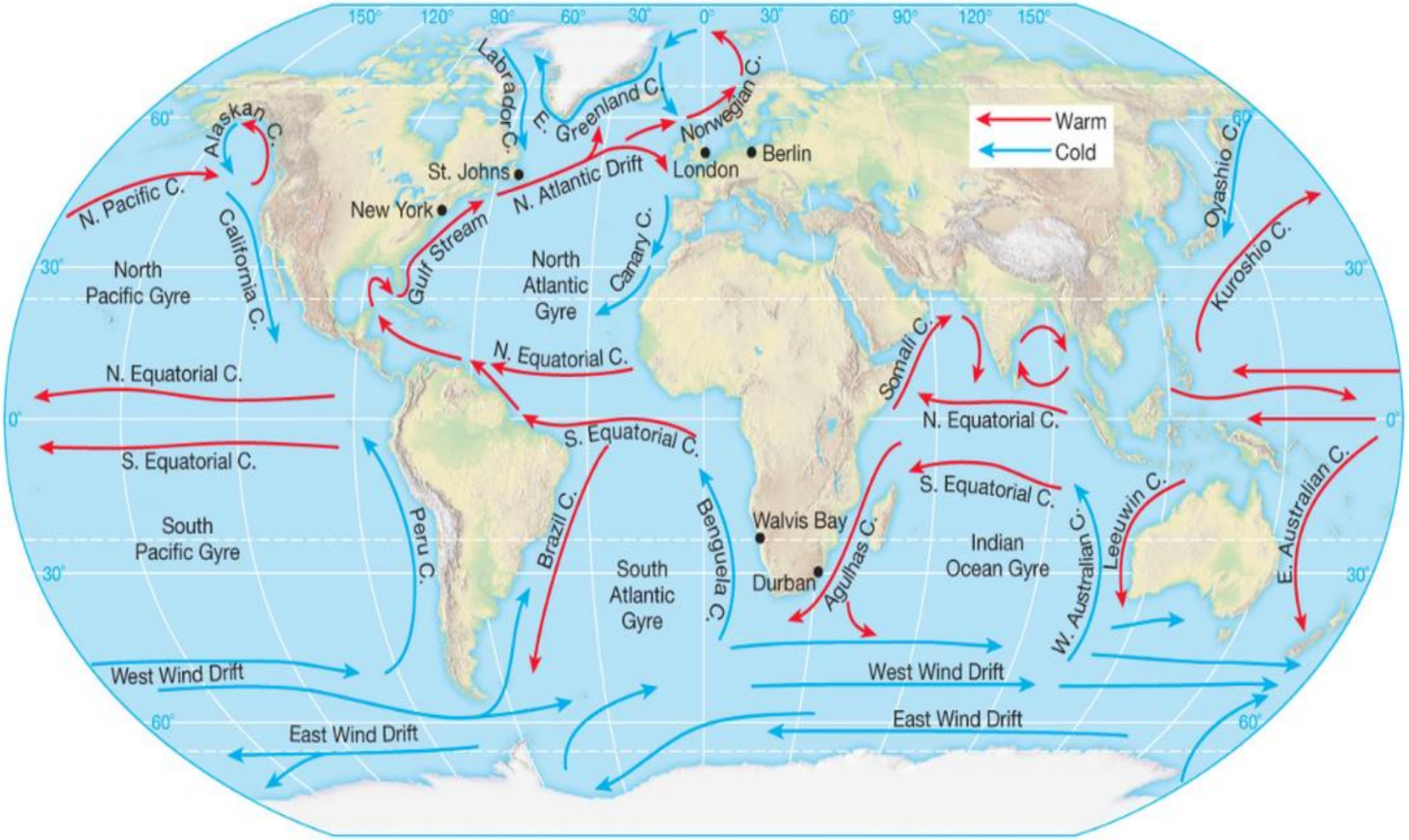
Surface Currents

- Generated by heat energy from sun and winds
- **Gyres** = large circular currents.
  - Broad, slow-moving

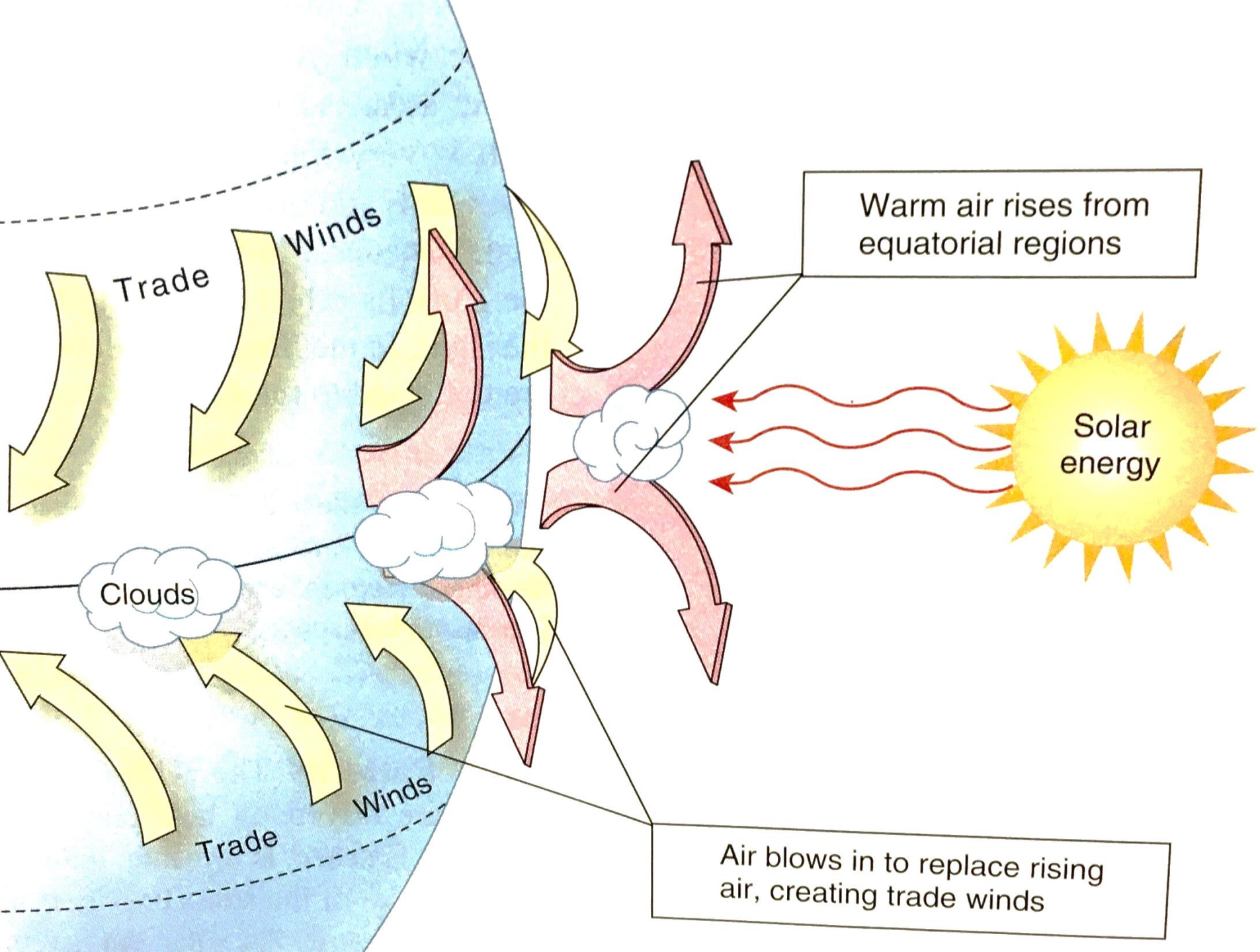
Gulf Stream

California Current



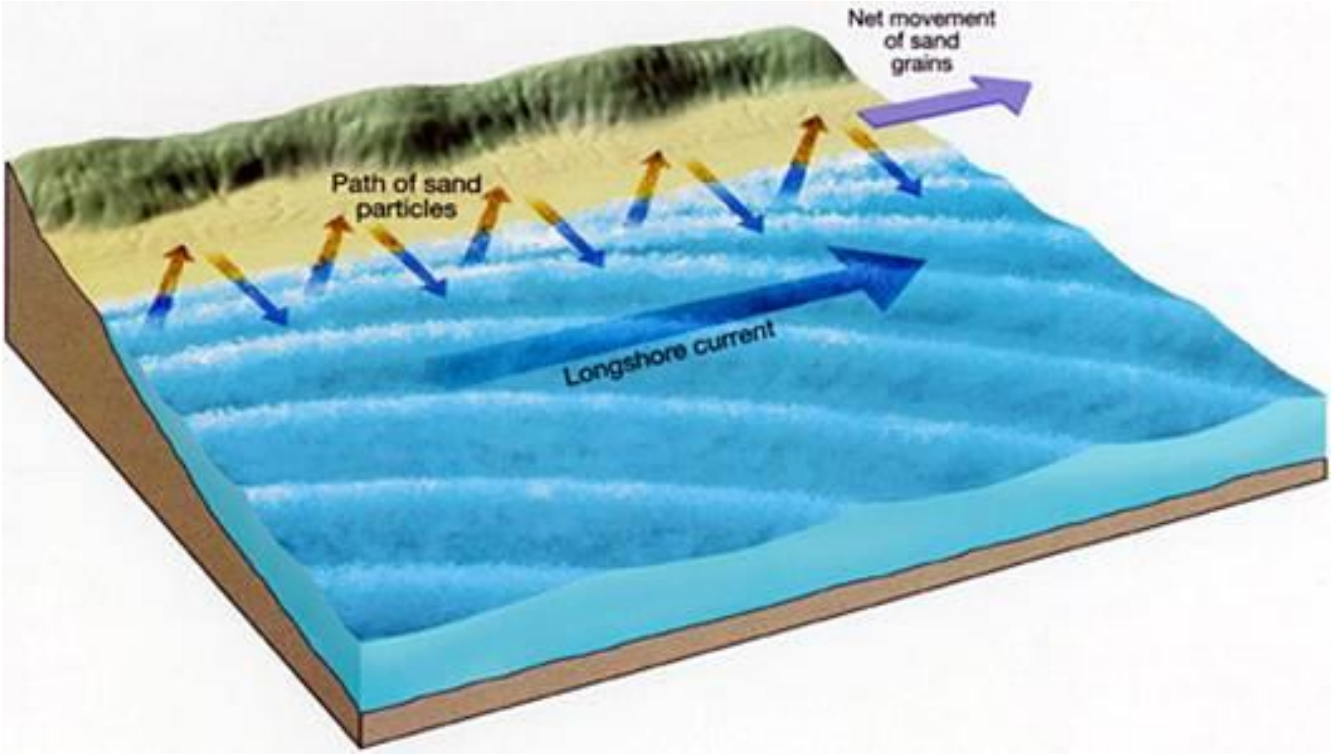


- Warm water currents move away from equator, toward poles.
- Cold water currents carry water from poles toward equator.


Trade
Winds
Clouds
Trade
Winds
Warm air rises from equatorial regions
Solar energy
Air blows in to replace rising air, creating trade winds

Surface Currents

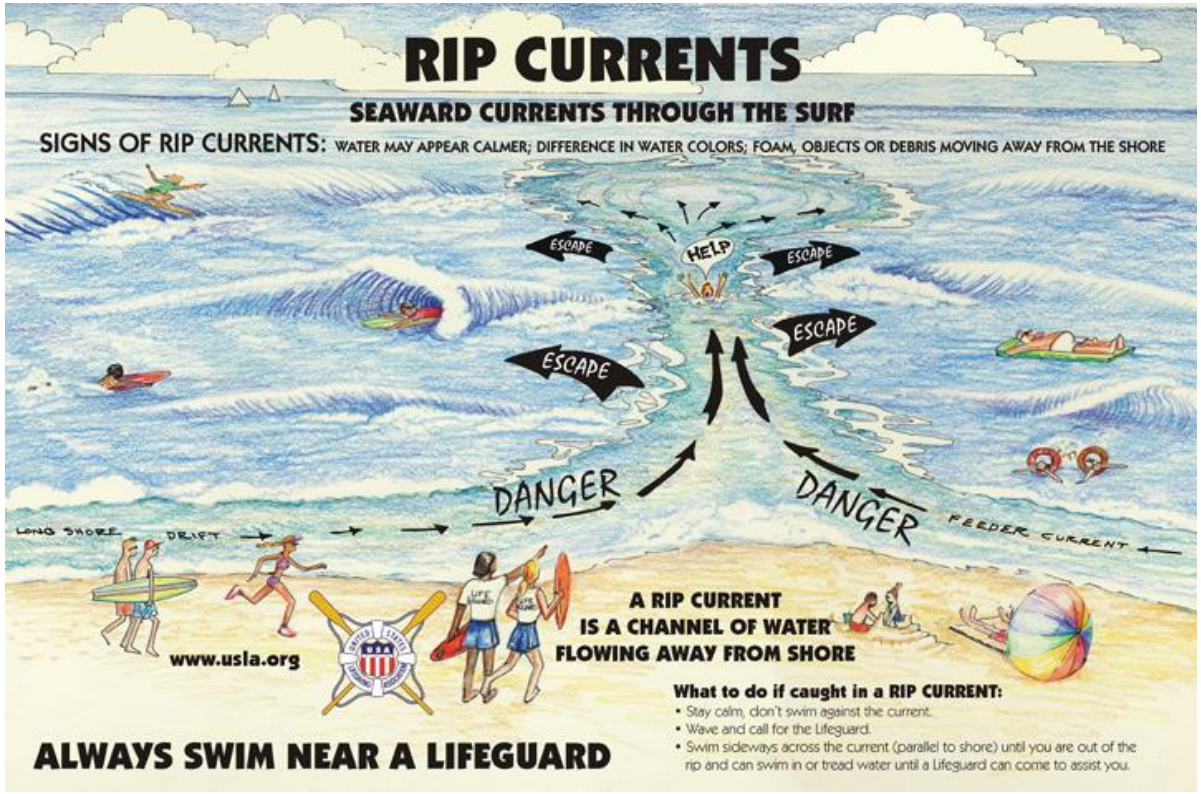
Longshore Current: flows parallel to shore; moves sediment



Surface Currents

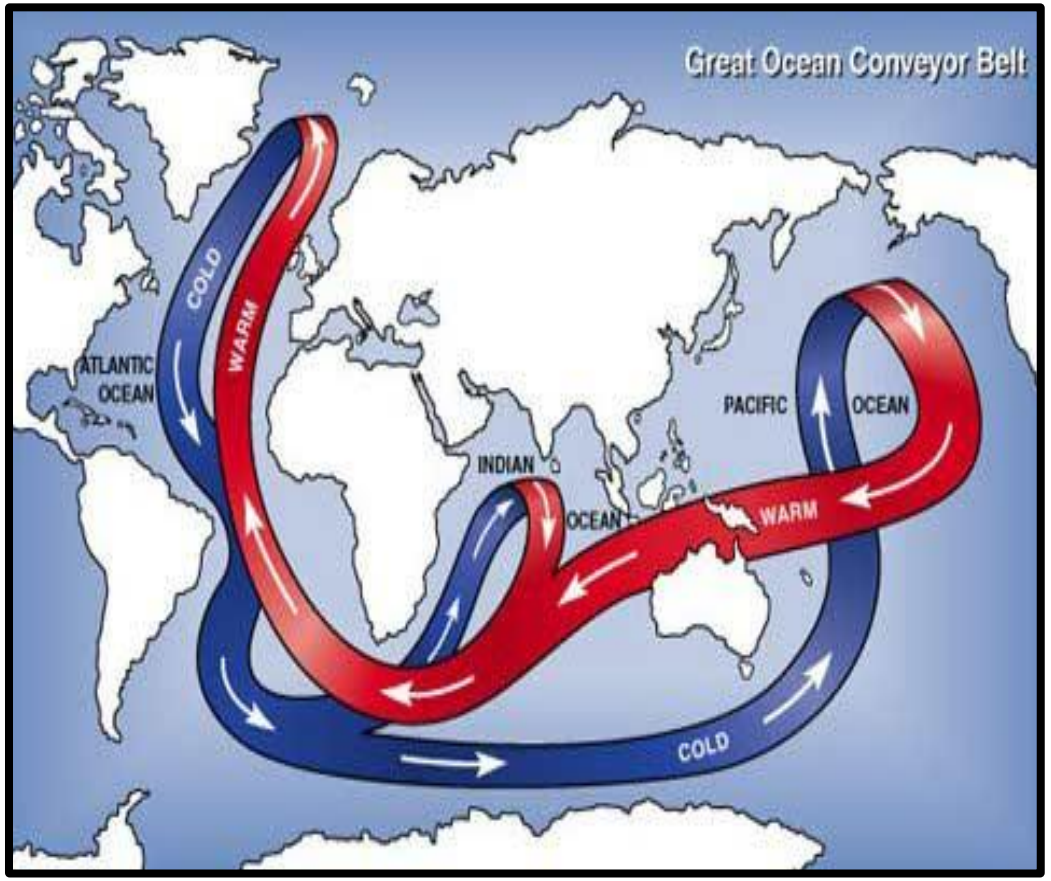
Rip Current:

- Caused by converging longshore currents
- Very dangerous
- DO NOT fight rip current; swim parallel to shore to get out of channel



Deep Ocean Currents

- Flow below the surface; cross the equator
- Move North to South
- Separated from surface currents by boundary
- "**Thermohaline Circulation**" (difference in densities)



Deep Ocean Currents

- Upwelling: brings deep water up to surface.
- Circulates nutrients
- Moves plankton & larvae