

Motion of the Oceans

Standard 5: Differential (uneven) heating of the Earth by the sun results in circulation patterns in the atmosphere and oceans called air and ocean currents.

Part 1: Global Ocean Currents (Prentice Hall Earth Science book p. 286)

Directions: On the diagram below, color the warm currents red and the cold currents blue.

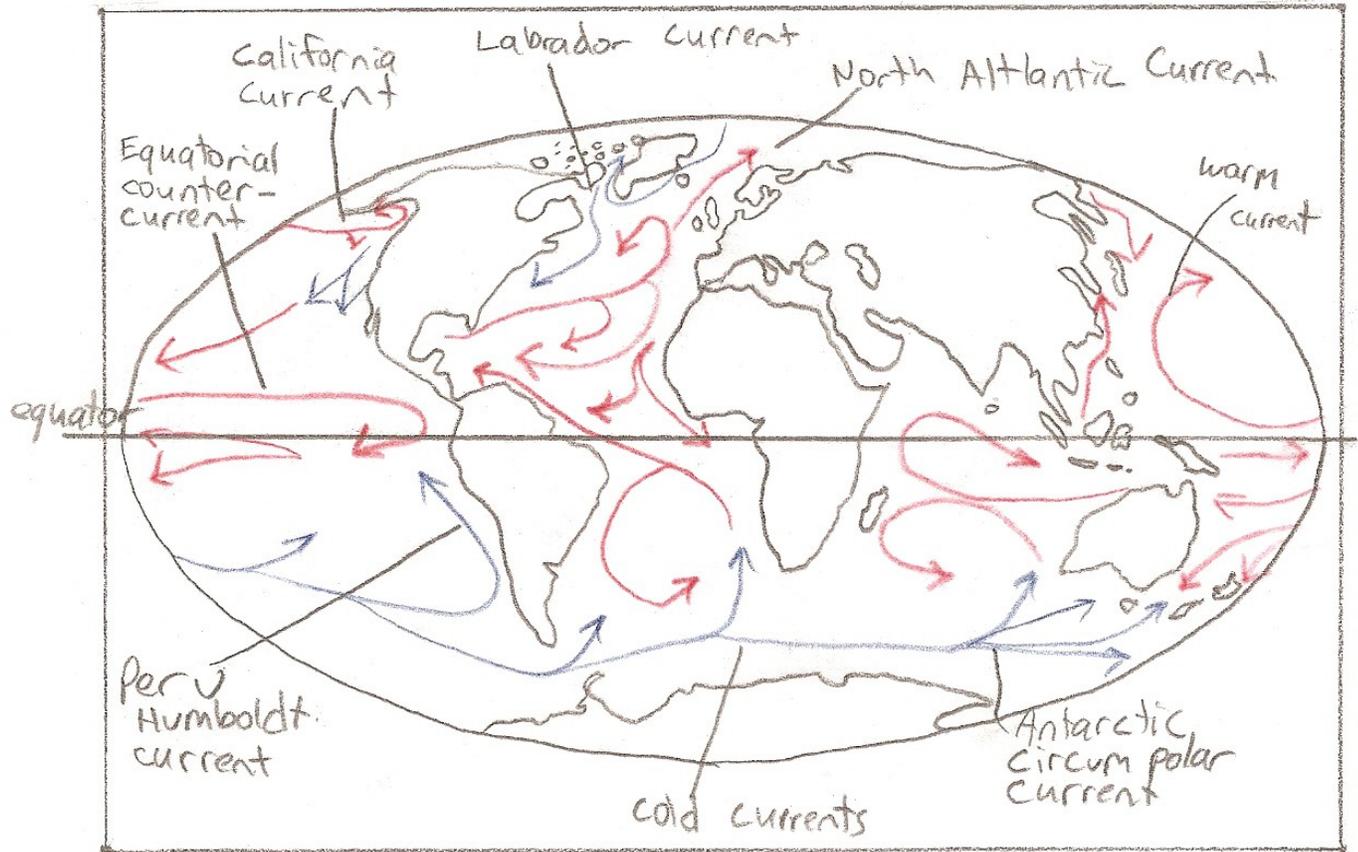


Figure 11-24 P-H P286

- (1.) An ocean current is like a _____ of water, flowing in the ocean. (2.) Currents caused by wind are called s_____-c_____. (3.) The G_____ is a surface current that flows from the Gulf of Mexico to Europe and western Africa. (4.) Currents move _____ in the northern hemisphere. (5.) Currents move _____ in the southern hemisphere. (6.) Surface currents move _____ y but deep currents move _____ y. (7.) Deep currents are caused by differences in the _____ of ocean water. (8.) Water of different densities _____ t mix. (9.) Ocean water density is affected by t_____ e and s_____ y.

Word Bank

surface currents	river	density
clockwise	horizontally (side to side)	does not
counter-clockwise	vertically (up and down)	Gulf-Stream
temperature	salinity	

Part 2: Ocean Water Density Demonstration

Watch the demonstration. Color in and label the layers to learn about ocean water density. ☺

2a Affects of temperature on ocean water density

	Temperature: _____
	Temperature: _____

(10.) The force of _____ pulls the denser water down. (11.) The _____ water floats on the _____ water because it is less dense.

2b. Affects of salinity on ocean water density

	Fresh water/Salty water (circle one) _____
	Fresh water/Salty water (circle one) _____

(12.) The most common salt in the oceans is _____ - _____ (NaCl). (13.) The salt in the oceans comes from run off from the _____. (14.) The force of _____ pulls the denser water down. (15.) The _____ water floats on the _____ water because it is less dense.

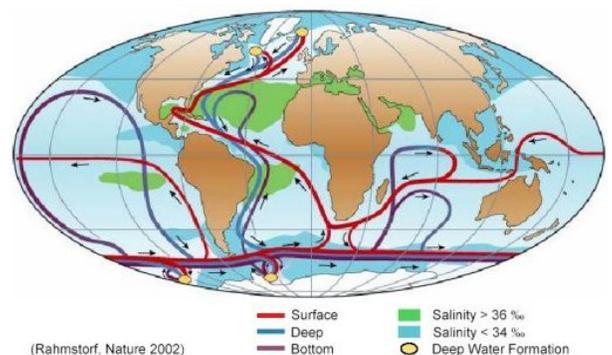
Word Bank

warm	land	gravity	salty
cold	sodium chloride	gravity	fresh

Part 3 Checking for Understanding. (Please answer in complete sentences on binder paper).

15. What is an ocean current?
16. What causes surface currents?
17. What causes deep currents?
18. How do currents flow in the northern hemisphere?
19. How do currents flow in the southern hemisphere?
20. Which currents keep Europe warm in summer?
21. Which 2 factors affect ocean water density?
22. Why does fresh water stay on the surface of the ocean for miles from where a river enters it?
23. More O₂ dissolves in cold water than in warm water. Which part of the ocean has the most O₂?
24. What does “*differential heating of the Earth by the sun*” mean?
25. Which is better at keeping its temperature constant: land or water?
26. What distributes the warm temperatures around the Earth?
27. What does “*thermo-haline-circulation*” mean?

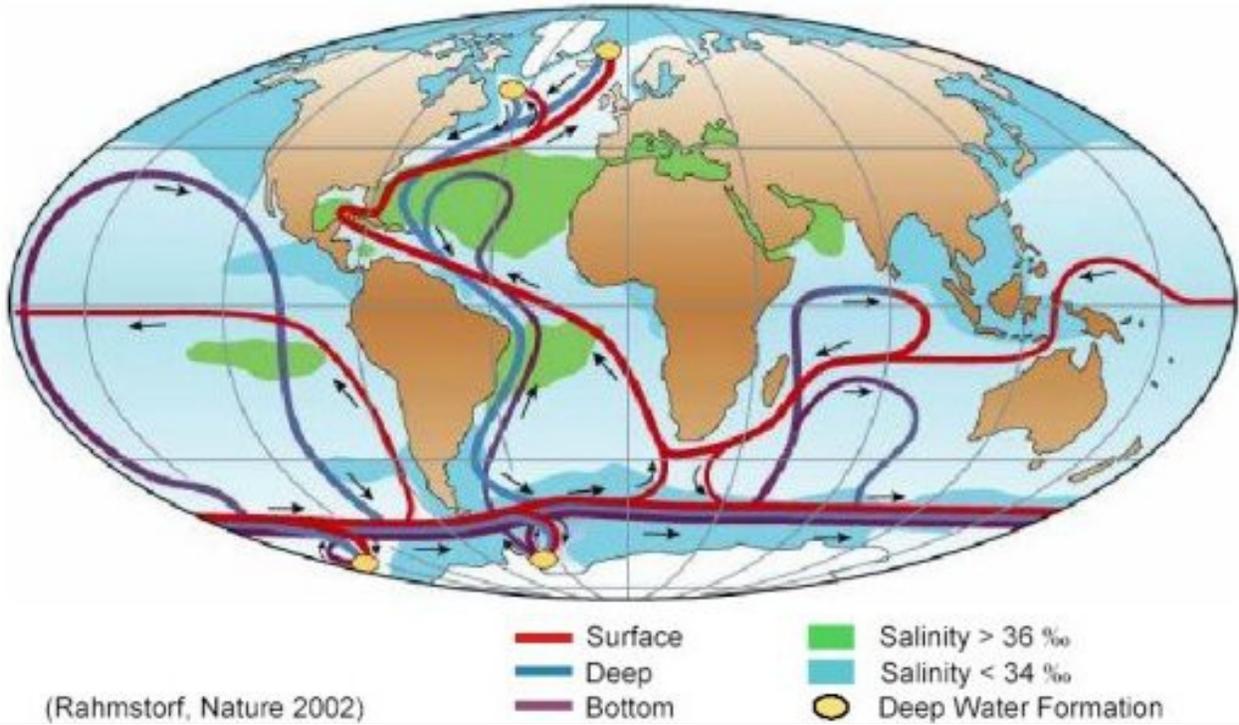
Thermohaline Circulation



http://www.pik-potsdam.de/~stefan/thc_fact_sheet.html

The diagram above show “thermohaline circulation. “Thermo” means temperature, “haline” means saltiness. World wide, warm surface currents flow from the equator to the poles. Then the water becomes cold, dense saltier and sinks. The dense deep currents flow back to the equator in a big loop called “thermohaline circulation.

Thermohaline Circulation



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