

APES FRQ - Atmospheric and Ocean Currents

Most scientists agree that Earth's warming trend is due to greenhouse gases humans have put into the atmosphere. As the greenhouse effect continues to warm the planet slowly, the patterns to the world's ocean and atmospheric currents will change.

One of the consequences of global warming is the melting of the glaciers of Greenland. Scientists are concerned that this melting may dilute the salt water in that region of the ocean enough to shut down thermohaline circulation.

Scientists are also concerned that the high pressure, descending boundaries of Hadley cells in the Northern and Southern Hemisphere may expand beyond 30° latitude, perhaps by 2° degrees latitude over the 21st century.

- a. **Explain** how melting glaciers at the poles can shut down thermohaline circulation. (2 pt)
- b. **Explain** what effect a shut down of this circulation would have on the temperature of western Europe. (2 pt)
 - *Need a hint on a and b? Read "Thermohaline Circulation" and "Heat Transport" at crjust.us/pp9697*
- c. **Explain** how air circulates in a Hadley cell and **describe** the general weather patterns found at the equator and 30° north and south latitude. (2 pt)
- d. **Describe** what effect an expanding Hadley cell boundary might have on ecosystems beyond 30° latitude. (1 pt)
 - *Need a hint on c and d? Read "Formation of Convection Currents" at crjust.us/pp9192*