

Extension Activity: EXPLORING GLOBAL OCEAN CURRENTS

The density currents generated in polar waters are part of a global oceanic current circulation system.

Begin by visiting <http://www.divediscover.who.edu/circulation/world.html> and clicking on either the Windows Media Player or Quicktime links to view the visual as a movie. Once the movie is loaded, use the play button to view it several times. Record your answers in your notebook.

- According to the information presented on the page you visited, what do the colors of the arrows represent?
- Are all ocean currents "surface currents"?
- Are surface currents connected in some way to deep water currents? If so, describe in detail.

Let's take a closer look at the currents illustrated in the previous video. Link to http://forces.si.edu/arctic/04_00_16.html. Use this scientific illustration to help you answer the following questions:

- Describe where (geographically) the global surface ocean current subsides to become a deep water current.
- Apply what you learned during the course of the experiments you conducted and explain why the surface current becomes a deep water current where it does.
- The illustration indicates "sea to air heat transfer" as the surface water current, called the Gulf Stream crosses the Atlantic Ocean. Apply your understanding of latitude and incoming solar radiation and explain why there would be a net transfer of energy from the sea to the air in this region.
- The Gulf Stream is literally a river of water flowing across the top of the Atlantic Ocean. What is the most important difference between the Gulf Stream and the surrounding waters of the open ocean that enables the Gulf Stream to flow across the surface of the ocean?
- In what geographic region(s) might "air to sea heat transfer" occur?