OPEN ACCESS Freely available online

Journal of Oceanography and Marine Research

Editorial

Properties of Ocean and Its Current Systems

Billy Graham*

Department of Fisheries Technology, Bangladesh Agricultural University, Mymensingh, Bangladesh

DESCRIPTION

Once water is set in motion, it won't stop until it meets a stronger, opposing force. It can be slowed, however, by friction from contact with slower currents and waves, as well as with essentially non-moving volumes of water near the ocean floor. Currents also decelerate as gravity pulls them down. The region of the ocean affected by wind is the Ekman layer, which extends about 100 metres (330 feet) below the surface of the ocean. Below this layer, the circulation of currents is much slower. Two properties of ocean water contribute enable circulation at great depths: temperature and salinity. When water cools, it becomes denser and sinks, displacing the water below. The more saline the water, the denser it is. Together, these properties create a process called thermohaline circulation, first discovered in 1960. Thermohaline circulation is constant in Polar Regions, where water at the surface cools, sinks, and is replaced with more water. The current is created and travels at depth until it finally upwells again in a return current to Polar Regions. Thermohaline circulation is responsible for slowly moving a huge volume of water all over the world. Carrying nutrients obtained from the ocean floor, the upwelling process brings these nutrients to the surface, replenishing the needs of ocean plant and animal life.

Oceanic water also interacts with the atmosphere, exchanging enormous quantities of oxygen and carbon dioxide. The ocean absorbs much of the sun's radiation as heat is delivered downward into the ocean's depths. Warm-water currents carry heat. When this heat is transferred to the atmosphere, air rises, creating regions of low pressure. In contrast, cold-water currents cause high pressure systems. Both warm and cold currents affect the climate, but the reverse is also true. Some scientists believe that global warming could shut down or weaken parts of the thermohaline ocean current system. Some scientists speculate that an influx of freshwater from ice sheets and glaciers running into the North Atlantic could "freshen," and thus disrupt the sections of the thermohaline circulation. Since freshwater is less dense than salt water, significant amounts of freshwater entering the North Atlantic may lower the density of surface waters and stop the sinking motion that drives thermohaline circulation.

Several well-documented current systems greatly impact climates. The Gulf Stream is a warm current flowing north-eastward in the North Atlantic off the North American coast. It is part of a clockwise-rotating gyre that begins with the westward-moving North Equatorial Current. Some consider the Florida current sweeping warm water up the Florida and Carolina coasts part of this system as well. The Gulf Stream tends to change over time, at times even seeming to disappear and then reappear. Its winds carry warm, moist air to north-western Europe. In winter, the air over the North Atlantic west of Norway is more than 22°C (40°F) warmer than the average for that latitude. The Gulf Stream is one of several western boundary currents. The Kuroshio in the north-western Pacific is an example of another. Although these currents bring moderate and warm weather to the coasts, occasionally irregular events cause shifts in the currents and dramatic changes in weather.

Correspondence to: Dr. Billy Graham, Department of Fisheries Technology, Bangladesh Agricultural University, Mymensingh, Bangladesh, E-mail: grahambilly@gmail.com

Received: October 25, 2021; **Accepted**: November 08, 2021; **Published**: November 15, 2021

Citation: Graham B (2021) Properties of Ocean and Its Current Systems. J Oceanogr Mar Res. S3: e002.