

The Value of Equatorial Current Studies to Fisheries

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Abstract

This paper describes a striking environmental feature which may have an effect on the fishing industry in the Gulf of Guinea.

The existence of an easterly flowing undercurrent at a depth of about 150 feet below a westerly moving surface current near the equator in the Atlantic Ocean was first measured in 1886. This information was ignored by both theoretical and descriptive oceanographers and by the fishing industry until 1952, when a similar undercurrent was discovered in the Pacific Ocean from the drift of a basic fishing gear, long-line gear. Since 1959, a number of cruises in the Atlantic Ocean have shown that the undercurrent can extend from 35°W to 7°E longitude from about 1°N to 1°30'S latitude. Its termination may vary but occurs between 0° and 7°E longitude.

In order to determine the exact structure and easterly extent of the undercurrent, the University of Miami in cooperation with the Bureau of Commercial Fisheries has conducted two cruises in the eastern Atlantic Ocean and the Gulf of Guinea. These cruises were part of the EQUALANT (ICITA) program. The results indicate that this undercurrent is located at or near the thermocline and that its general location is shown by the salinity distribution. Examination of the temperature-salinity data and the direct current measurements by drogues indicate that the undercurrent separates at least two different water masses and that there is little or no mixing across or along the undercurrent. The fact that the undercurrent is associated with the thermocline, that it separates two distinct water masses whose composition might affect the abundance and location of tuna or other organisms in the area, and that its termination point may vary between 0° and 7°E longitude may be of great importance to the fishing industry.

This basic feature can be of importance in the prediction of the location and abundance of commercially available fish. It is an example of environmental data useful to the fishing industry.

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