



Abstract View

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Average Seasonal Variation of the Atlantic Equatorial Currents from Historical Ship Drifts

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ABSTRACT

Surface currents in the tropical Atlantic were studied using historical ship-drift data. These are the only available data capable of resolving the long-term seasonal fluctuations of currents over a broad geographical region. The North Equatorial Countercurrent was found to extend as a continuous eastward-flowing current across the Atlantic in the band 5–8°N from July to December.

The maximum average eastward velocity was $\sim 30 \text{ cm s}^{-1}$ during July–September. East of 20°W the countercurrent continued throughout the year. West of 20°W and from January to June the countercurrent disappeared and westward currents were observed. Average westward velocity reached 20 cm s^{-1} in April and May, centered near 40°W. The annual cycle in surface velocity (20 cm s^{-1} amplitude) agrees closely with that of geostrophic velocity inferred from variations in thermocline depth across the counter current jets, centered near 2°N and 4°S, separated by a minimum near 1°S. The northern jet has a large (14 cm s^{-1}) semiannual variation. The fastest velocity, 61 cm s^{-1} , occurs in June corresponding to a rapid increase in eastward velocity in the Countercurrent, Large values of eddy kinetic energy coincide with the locations and times of strong shear between the Countercurrent and the northern Jet of the South Equatorial Current.

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