Abstract View

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Development of Near-Surface Flow Pattern and Water Mass Distribution in the Somali Basin in Response to the Southwest Monsoon of 1979

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ABSTRACT

Near-surface observations of temperature, salinity and current are used to describe the seasonal reversal of the Somali Current during 1979, in response to the onset of the southwest monsoon winds. During April, prior to the reversal of the winds north of the equator, the northward flowing East African Coastal Current (EACC) and the southward flowing Somali Current (SC) converged near the equator. The EACC was characterized by surface waters with salinities less than 35.1%, and the SC by salinities greater than 35.3%. The winds reversed north of the equator during the first week of May, and the boundary current intruded in the form of an anticyclonic gyre to 2.5°N. Most of the low-salinity water was recirculated back south of the equator by the offshore limb of the gyre. It did not flow continuously at the surface into the eastward equatorial jet, which was present farther offshore during May and June. That current was fed by high-salinity water from the region to the north of the low-latitude gyre. Surface winds increased dramatically in early June; and subsequently, the gyre intruded farther north and east; recirculation southward across the equator was still observed. A second gyre spun up north of the southern feature, apparently in response to the increase in winds. During July

and early August the southern gyre intruded farther north, the northern gyre intensified and the equatorial jet disappeared. The data are inadequate to resolve the rapid changes which occurred in late August. The net result was the replacement of the offshore flow between the equator and 5°N by onshore flow along the equator and advection of low-salinity water from south of the equator to 12°N. The observations are discussed in the context of model results and implications for the redistribution and modification of local water masses.

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