Abstract View

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A Comparison of Observed and Numerically Simulated Circulation in the Cayman Sea

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ABSTRACT

An observational and numerical study of the circulation in the Cayman Sea is presented. Data taken in three different years suggest a common February to May circulation pattern. A well-developed current crosses 85W south of the Cayman Ridge. An anticyclonic eddy in the central basin appears to be a common feature of this season's circulation. Finally, the data from these cruises consistently portray significant accelerations occurring in the vicinity of Cozumel Island where the flow merges with the Yucatan Current. A different pattern is inferred from data collected in July and August. The north component of the flow over the western edge of the Cayman Ridge appears to determine the type of flow regime observed.

The numerical model is based upon predictive equations for the vorticities in a two-layer ocean on a beta-plane, and includes topographic, advective and friction effects. The model is driven by lateral input boundary conditions derived from an April–May 1968 observational study. The baroclinic western boundary current of the numerical model develops in response to eastern input boundary conditions, while the barotropic current is constrained to intensify and flow along the continental slopes.