Abstract View

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The Circulation in the Gulf of Mexico Derived from Estimated Dynamic Height Fields

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ABSTRACT

Monthly mean dynamic height topographies for the upper 500 m of the Gulf of Mexico, seasonal mean topographies for the upper 1000 m and annual topographies for the deep flow are presented. The dynamic height values on a 1° × 1° grid were determined from observed temperature values and salinities derived from mean *T-S* relations. The seasonal intrusion of the Loop Current is observed and found to vary directly with the geostrophic transport through the Yucatan Straits. At the Straits, the transport in the upper 500 m is a maximum in June. The transports in the upper 500 m of an anticyclone in the western Gulf are a maximum in winter and summer, and a minimum in spring and fall. There is a permanent westerly flow on the Texas Shelf. After turning cyclonically, this flow joins the eastward transport of the northern limb of the anticyclone in the western Gulf of Mexico. Most of this eastward flow recirculates in the anticyclone; however, a portion flows cast across the central Gulf to become entrained in the Loop Current. The deep circulation between 1500 and 3000 m is dominated by an anticyclonic gyre which fills the entire deep basin.