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Minerals Management Service
Gulf of Mexico OCS Region

Technical Announcement

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*Observational and Predictive Study of Inner Shelf Currents
Over the Louisiana-Texas Shelf*

OCS Study MMS 2004-036

The Minerals Management Service (MMS), Gulf of Mexico OCS Region, announces the availability of a new study report, *Observational and Predictive Study of Inner Shelf Currents over the Louisiana-Texas Shelf*.

The MMS is interested in understanding coastal currents for a number of reasons. These include the prediction of oil-spill movements, as well as the use of coastal current data as ancillary information for data interpretation and analyses in other MMS studies. Inner shelf current studies may also add to our present understanding of the potential impacts of these currents on the highly productive marsh and estuarine areas of the Gulf of Mexico. This study builds upon the results of past MMS studies on this shelf by providing real-time current observations that can be used to extend and refine results and conclusions.

The discharge of the Mississippi and Atchafalaya Rivers flows westward along the coast, forming the Louisiana Coastal Current (LCC). This westward flow responds rapidly to wind events, such as cold fronts, and may reverse direction during such events. In summer, weaker winds and the onset of vertical stratification of the water column may decouple the surface and bottom currents at subtidal time scales. South Texas summer winds become favorable to upwelling, with currents reversing to an upcoast flow. Over the Louisiana shelf, the inner shelf flow reverses to eastward for a period of a month or more.

Analysis of buoy data verified previous findings of downcoast wind and current flow from September to March, and upcoast wind and current flow during summer. The results of the present analyses also indicate significant spatial and temporal variability in the response of currents to wind forcing along the Texas-Louisiana inner shelf. A local, linear relationship between current and wind fields does not explain all of the observed variability in currents. Upstream river discharge and local flow convergence have been suggested as important contributors to this variability, as has local upwelling and downwelling.

Princeton Ocean Model results obtained and reported in this study generally confirmed the above data results and support the hypothesis that the river plume structure is primarily modified by local winds.

This report is available only in compact disc format. The discs are available from the Minerals Management Service, Gulf of Mexico OCS Region, at a charge of \$15.00 by referencing OCS Study MMS 2004-036. The report may be ordered through the Minerals Management Service's on-line ordering system at <http://www.gomr.mms.gov/WebStore/front.asp>. You will be able to obtain this report also from the National Technical Information Service in the near future. Here are the addresses. You may also inspect copies at selected Federal Depository Libraries.

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New Orleans, Louisiana 70123-2394
Telephone requests may be placed at
(504) 736-2519 or 1-800-200-GULF
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5285 Port Royal Road
Springfield, Virginia 22161
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The Minerals Management Service is the federal bureau in the U.S. Department of the Interior that manages the nation's oil, natural gas and other mineral resources on the Outer Continental Shelf (OCS) in federal offshore waters. Currently, about 30 percent of the oil and 23 percent of the gas produced domestically comes from these federal waters. The bureau also collects, accounts for, and disburses mineral revenues from Federal and American Indian lands. MMS disbursed approximately \$8 billion in Fiscal Year 2004 and more than \$143 billion since it was created in 1982. Nearly \$1 billion from those revenues go into the Land and Water Conservation Fund annually for the acquisition and development of state and federal park and recreation lands.

MMS Main Website: www.mms.gov
Gulf of Mexico Website: www.gomr.mms.gov

*** MMS: Securing Ocean Energy and Economic Value for America ***

[Return to Technical Announcements](#)