Technical Announcement

MMS

U. S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

Date: July 2009

Contact: Caryl Fagot
(504) 736-2590

Loop Current Frontal Eddies Based on Satellite Remote Sensing and Drifter Data

OCS Study MMS 2009-023

The Minerals Management Service (MMS), Gulf of Mexico OCS Region, announces the availability of a new study report, *Loop Current Frontal Eddies Based on Satellite Remote Sensing and Drifter Data*.

Researchers from Louisiana State University, University of Colorado, and Horizon Marine, Inc. joined efforts to develop and apply new remote-sensing methodologies to improve the surveillance of ocean features in the Gulf of Mexico (GOM). The objectives were to improve the understanding of the basic characteristics of Loop Current frontal eddies (LCFE) cyclones, where they develop, how they evolve as they travel around the Loop Current, frequency of occurrence, and their impacts on surface and deeper circulation in areas of oil and gas operations. The data employed involved remote sensing of sea surface temperature and ocean color, and a unique archive of GOES-8 and GOES-12 night-time "de-clouded" composite imagery (January 1996 to the present); satellite-derived sea surface height (SSH) data in the Gulf dating back to 1993; and near-surface velocities using drifting buoys that are deployed routinely in features of interest. The new techniques provided the means to determine metrics on LCFE motion, size, frequency, and intensity during the study periods of September-May of 2001-2002, 2002-2003, and 2003-2004. Case study analyses of selected events provided important additional information on LCFE variability during extreme events and their effects on circulation through the water column. The LCFE's along the Campeche Bank averaged 49 km (30 mi), based on along track SSH data and -21 cm (-8 in) SSH. As these features moved northward, they typically increase in size to 120 km (75 mi) and SSH to -27 cm (-11 in). Mean speeds of these features were 23-32 cm/s (9-13 in) and frequencies varied from 3 per month to 4.4 per month. One of the outstanding results was the observation of intense (-30 to -40 cm; -12 to -16 in) LCFE's with large spatial scales (~150 km; 93 mi) proximate to latitude 22° N.

This report is available only in compact disc format from the Minerals Management Service, Gulf of Mexico OCS Region, at a charge of $15.00, by referencing OCS Study MMS 2009-023. The report may be downloaded from the MMS website through the Environmental Studies Program Information System (ESPIS). 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.

Minerals Management Service
Gulf of Mexico OCS Region
Public Information Office (MS 5034)
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394
Telephone requests may be placed at
(504) 736-2519, 1-800-200-GULF, or
Rush Orders: 1-800-553-6847
Fax: (504) 736-2620

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
Phone: (703) 605-6040
Fax: (703) 605-6900
Email: bookstore@ntis.gov

MMS Main Web site: www.mms.gov
Gulf of Mexico Web site: www.gomr.mms.gov