U. S. Department of the Interior
Bureau of Ocean Energy Management
Gulf of Mexico OCS Region

Technical Announcement

Date: January 2015

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Measurements in the Yucatan-Campeche Area in Support of the Loop Current Dynamics Study

OCS Study BOEM 2014-669

The Bureau of Ocean Energy Management (BOEM), Gulf of Mexico Outer Continental Shelf (OCS), announces the availability of a new study report, the *Measurements in the Yucatan-Campeche Area in Support of the Loop Current Dynamics Study.*

The Loop Current (LC) is a branch of the major western boundary current system of the North Atlantic that includes the Florida Current and the Gulf Stream. It enters the Gulf of Mexico through the Yucatan Channel, makes a clockwise Loop through the eastern basin, and exits through the Straits of Florida between Cuba and Key West. This energetic and variable current is the major source of upper layer (surface to ~ 1000 m) eddies, and lower layer (below 1000 m) eddies and planetary waves throughout the deep waters of the Gulf. The LC, on an irregular cycle averaging 9 to 11 months, extends to the northwest towards the Mississippi delta, and sheds a large warm, clockwise rotating eddy of ~ 200 to 400 km in diameter. A moored array of 9 full-depth and 7 near-bottom moorings, and 25 bottom-mounted, pressure-equipped inverted echo sounders (PIES) was deployed in an array in the deep basin of the eastern Gulf for 30 months beginning in April 2009. The Mexican complementary study deployed nine full-depth moorings in two transects across the western Campeche Bank slope for 24 months beginning in June 2009. The near-bottom moorings were equipped with one current meter 100 m above bottom.

The full-depth moorings were equipped with a variety of instrumentation, including acoustic current profilers, current meters and temperature, salinity and pressure (T/S/P) instruments, distributed so as to adequately capture the velocity and T/S vertical structure of the strongly sheared and nearly depth-independent upper and lower layers, respectively. PIES measure bottom pressure, temperature and the acoustic travel time from bottom to the surface and back. The latter are converted to water column T/S profiles using the historical database of T/S casts. Additionally, historical remote sensing data, including altimeter measurements of sea-surface height, sea-surface temperature and ocean color were acquired through the period of the field studies. Finally, a numerical circulation model was used to investigate the dynamics using observations. A high rate of data return was obtained from the moored instruments in both the U.S and Mexican sectors.

This report is available on CD from the Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, for $15.00, and free of charge as a pdf file downloaded from the BOEM Website. Copies can also be viewed at selected Federal Depository Libraries. The addresses are listed below.

To order a CD, use the Gulf of Mexico OCS Region contact information below and reference OCS Study BOEM 2014-0669. To download a pdf copy, use the Environmental Studies Program Information System (ESPIS) and search on the study report number. In the near future, you will also be able to get this report also from the National Technical Information Service.

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