

ROFFER'S OCEAN FISHING FORECASTING SERVICE, INC.

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**ROFFS™ OCEANOGRAPHIC ANALYSIS FOR THE DEEPWATER HORIZON OIL SPILL AREA
UPDATED 24 MAY 2010 (15:00 HRS)**

See enclosed PDF analysis as the graphic is enclosed. Additional materials can be found on our website (<http://www.roffs.com/>). **Also note that we will start reducing our emails on this project, so please view our website daily for our updates. We plan on posting the updates by 6:00 PM daily. We are trying to drive you to the website to save us time in distribution, as well as, supporting our sponsors who will be shown on the page.**

Today's analysis is based on today's (Monday) infrared, ocean color, RGB data, and SAR, Saturday's and Sunday's SAR, as well as, ocean color Friday-Sunday (composite included). The meso-scale Loop Current eddy continues to develop and the relatively cooler and higher chlorophyll water continues to move westward and the western boundary of this water was seen at 87°30'W & 24°15'N this morning. This westward motion had been associated with a counter-clockwise eddy last week, but today we do not see any rotation near 87°15'W & 24°15'N. Based on the recent and today's motion we anticipate that it will take at least seven more days for there to be a distinct surface separation of the meso-scale eddy (in formation) and the Loop Current that is primarily flowing eastward from the Yucatan Channel. Subsurface verification of separation should be made as well.

Today's RGB data shows that the surface oil (olive green) has reached the counter-clockwise eddy (centered roughly near 85°45'W & 27°30'N) west of Tampa, Florida and the tip of the oil was observed near 85°50'W & 27°07'N). We have received visual confirmation of this oil from on-site sampling by Dr. Jim Franks Southern Mississippi University who described a sheen and visible oil globules, 1/8 inch to 5 inches in diameter at 86°57'W & 27°45'N and 86°54'W & 27°46'N. Based on the motion of the water west of Tampa it appears that this surface oil is anticipated to travel the same path as the subsurface oil-water-dispersant mixture that we have depicted in a gray color. The southernmost point of this subsurface mystery oil that has been moving along the eastern boundary of the Loop Current was seen today near 84°25'W & 26°20'N. This water is expected to move along the boundary of the Loop Current the next few days away from Florida.

One of the issues we will be studying over the next 7-10 days is the likely behavior of the counter-clockwise eddy (85°45'W & 27°30'N) as it moves in a southeastward and southward motion as part of the Loop Current. We wonder if this eddy will: 1) follow the path of the previous eddy that has been carving out the new meso-scale Loop Current eddy; or 2) will it push the Loop Current water to the eastward flowing limb of the newly forming Loop Current that is moving eastward toward the Florida Keys between 24°00'N and 24°15'N and reconnect the new forming eddy to the Loop Current; or 3) a combination of these? We also wonder what will be the fate of the oil in this eddy? Will it rotate the newly forming Loop Current eddy or go to the Straits of Florida.

The surface oil continues to plague and severely damage the coastal ecosystems of Louisiana. Some reduction in the movement of the surface oil toward the coasts may come from the offshore pull of the Loop Current and circulation of the waters along the northwest side of the Loop Current. It is too early to determine how much advection of the surface oil will occur as the newly forming Loop Current eddy rotates around a center axis roughly near 87°00'W & 26°00'W. It will be several days until we see this.

The "mystery" subsurface oil-water mixture located southwest of the Florida Panhandle near 86°00-15'W & 29°00-30'W appears to be moving away from the coast in two directions: 1) southeastward as pulled by the eastern side of the Loop Current; and 2) westward toward 87°00'W & 29°00'N and southward. Unless the winds dramatically change we anticipate that this motion will continue over the next several days.

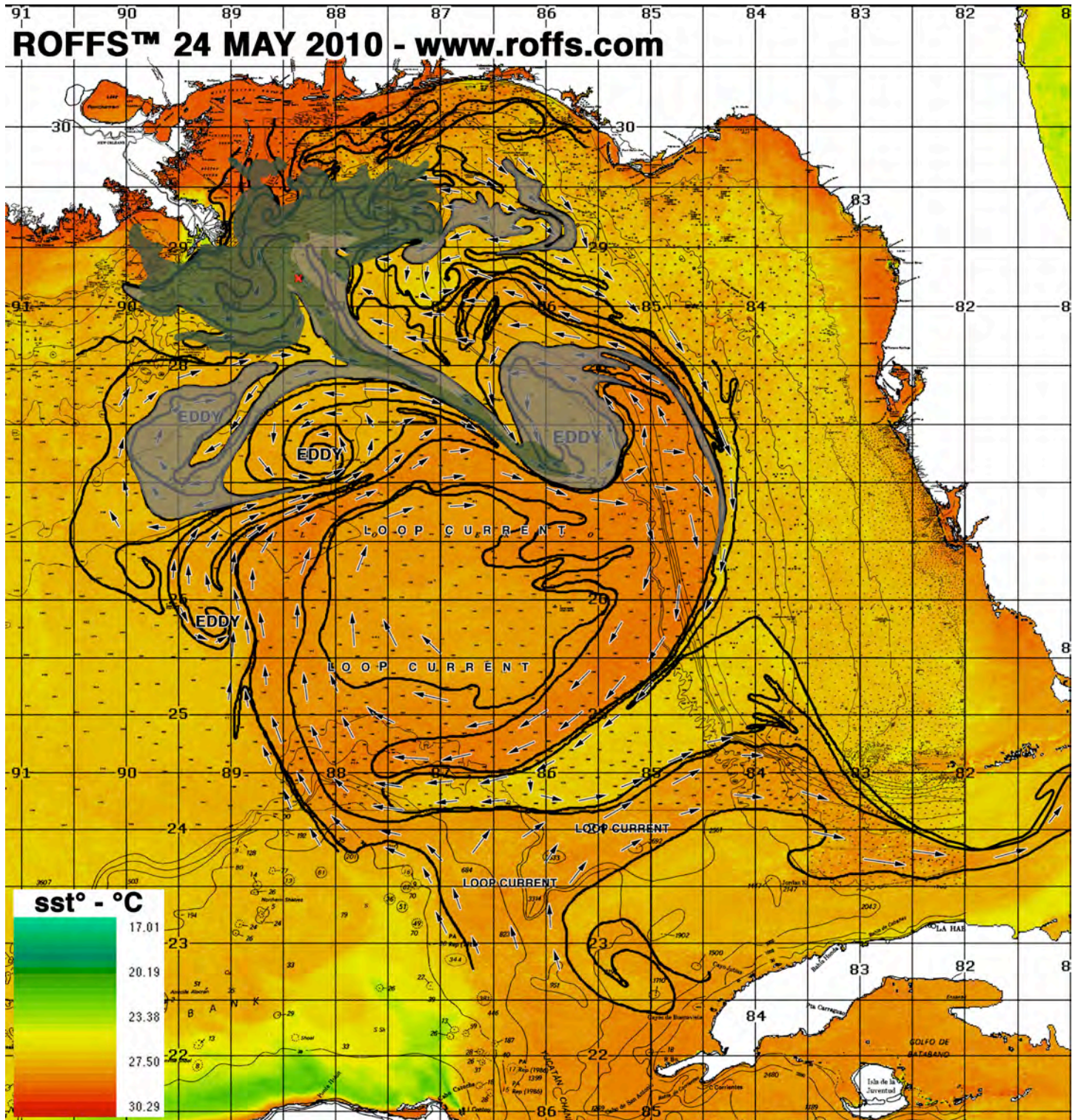
If you decide to use this analysis or the images contained within, please give credit to ROFFS™ and see more of our daily coverage here <http://www.roffs.com/>).

EDITORS NOTE:

While we have been conducting these analyses as a civic duty and as an exercise in technology transfer, we would like to be contracted to do this to support cleanup, restoration, and litigation efforts. If you plan to use these reports including the graphics you must give ROFFS™ full credit for this work. ROFFS™ would be appreciative if you would copy this analysis to others who may be interested in our efforts. At ROFFS™ we have been mapping the distribution and movements of the oil from the Deepwater Horizon spill from satellites since the explosion. Basically we are using a host of U.S. (NOAA and NASA) and European (ESA) satellites with a variety of spectral (infrared, near infra-red, visible, RGB and synthetic aperture radar) and spatial resolutions (300 meter to 1 KM) to see the oil. The MODIS satellite data are being received from the University of South Florida IMArs and the synthetic radar (SAR) imagery is being received from the CSTARS at the University of Miami and also from the NASA's Jet Propulsion Laboratory. We manipulate and integrate these data at ROFFS™ and the analyses are ROFFS™ expert interpretations of the satellite imagery along with other data such as winds, sea surface temperature, currents, and in-situ reports. We routinely discuss our results with several academic and non-academic oceanographers.

We use a plethora of techniques to remove or reduce the effect of clouds and satellite angle, as well as, to manipulate the satellite data to understand the ocean circulation patterns associated with the oil's motion. We focus our efforts on the offshore segment of the oil. Sequential image analysis allows us to visualize the motion. The red "X" indicates the site of the Deepwater Horizon spill area.

We have been deriving these analyses on a daily basis and posting them to our website (<http://www.roffs.com/>). We have many years of experience conducting similar analyses. For example we mapped the plume coming from the New Orleans area after Hurricanes Katrina and Rita (<http://www.roffs.com/katrina.htm>).



This image is an ocean color - chlorophyll + colored dissolved organic material (CDOM) composite derived from satellite data (NASA MODIS sensor) from USF IMaRS. This is a three day composite so the location of all the features seen in the infrared image analysis (above) will not be the same since the ocean continues to change. The deeper purple color is the low chlorophyll water that originates from the Caribbean Sea that forms the Loop Current and Gulf Stream. Note the separation of the newly forming eddy and the newly forming Loop Current flowing eastward. White clouds are seen as well. While we did not overlay the surface oil on this image, one can see a similar pattern in the distribution of apparent "higher chlorophyll +CDOM" waters as the surface oil. Aspects related to this is beyond the scope of these daily analyses.

