

ROFFER'S OCEAN FISHING FORECASTING SERVICE, INC.

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**ROFFS™ OCEANOGRAPHIC ANALYSIS FOR THE DEEPWATER HORIZON OIL SPILL AREA
UPDATED THURSDAY 27 MAY 2010 (17:00 HRS)**

See enclosed PDF analysis as the graphic is enclosed. Additional materials can be found on our website (<http://www.roffs.com/>). Tomorrow we will try to provide an update as function of available time. There are many issues today to consider. We were able to see the surface oil using RGB satellite imagery which is shown in olive green in the areas south and east of the Mississippi Delta. Due to the angle of the satellite pass and sun glint location we could not visualize the other surface oil that we had seen earlier this week using a combination of RGB and synthetic aperture radar (SAR). There were no usable SAR images today due to the location of the orbits of the satellites. As we do not believe that the surface oil has disappeared we have mapped this oil as a different color (lighter olive green) that extends from the oil spill site to the counter-clockwise eddy centered west of Tampa near 85°45'W & 27°20'N. We remind you that most of our efforts continue to be with the offshore component of the oil and not necessarily the coastal areas because that is where we have been monitoring the water that was associated with the first day of the oil spill which is shown as grey shapes. We are concerned about the coastal oil and we will be spending more time evaluating the flow of the surface oil from the Louisiana – Mississippi coastal zone toward Alabama and the Florida Panhandle as we continue to receive more reports of tar balls on the beaches of those areas. Note that the surface flow of the water is now directed from the surface oil eastward toward the Florida Panhandle (near 85°30'W & 30°00'N) where the flow becomes more southeastward. This is becoming an increasing concern to the west Florida shelf between the Panhandle and Naples, Florida. This is of particular interest due to the coastal and mid-continental shelf flow, but also due to the rotation of the newly formed Loop Current eddy which is more football shaped than spherical.

We are not totally convinced that the Loop Current eddy is not totally independent from the Loop Current so we have labeled the Loop Current eddy with a question mark (?). Although we have seen altimeter data and models (see the useful website at <http://www.aoml.noaa.gov/phod/dhos>) suggesting that the eddy is a separate entity, we have not seen expendable bathythermograph (xbt) data or other temperature at depth data verifying the altimeter modeling. At the University of Miami (RSMAS) we had been taught long ago as students by Tom Lee (now almost retired), George Maul (now at the Florida Institute of Technology), and others that temperature at depth verification is needed to confirm eddy separation. We also have learned from these researchers (now our colleagues) and other experienced Gulf of Mexico oceanographers (Ken Schaudt – www.Schaudt.US) that the Loop Current and the eddy should be separate from each other for several days to really consider it that it is likely to have a long lasting and more meaningful existence. Today we still see Loop Current water flowing northwestward around the eddy (see 87°30'W & 24°00'N) which suggests that the two are not totally independent. We will feel more comfortable calling this a sustainable eddy after the eastern side of the eddy, now seen along 84°30'W between 25°30'N and 27°30'N, rotates past the Loop Current. We are very concerned that the eastern side of the eddy will collide with the Loop Current and reform with it. IF this occurs, then there will be an excellent likelihood that the oil in the eddy west of Tampa will flow directly to the Florida Keys and NOT be pulled around the eddy away from the Florida Keys.

Today we could not distinguish between the leading edge of the water moving southward along the eastern side of the eddy and the surrounding waters. This filament would likely be near 85°00'W & 25°10'N, but the water has mixed and blended with the surrounding waters. This was the leading filament that we had followed from the oil spill site from the first day of the spill. Some of this water will move around the eddy while additional parts will be pulled into the Loop Current headed for the Straits of Florida. We do not anticipate any substantial surface or subsurface expression of oil from this filament since it had traveled such a distance and mixed with the surrounding waters. We do not believe that the solution to pollution is dilution. But it seems in this case that the oil-water-dispersant mixture was diluted away from our view. The greater concern for the west Florida Shelf and Florida Keys remains the oil in the eddy west of Tampa and the oil northeast and southwest of the spill area. There are several of these filaments along the eastern side of the eddy west of Tampa shown in grey color.

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>).

