

ROFFER'S OCEAN FISHING FORECASTING SERVICE, INC.

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ROFFS™ OCEANOGRAPHIC ANALYSIS FOR THE DEEPWATER HORIZON OIL SPILL AREA UPDATED FRI. 21 MAY 2010 (19:00 HRS)

See enclosed PDF analysis as the graphic is enclosed. Note that today we have added a water temperature scale since we have been providing most of our analyses overlaid on a sea surface temperature image derived from infrared satellite imagery. The outlined water masses help you visualize the boundaries of the water masses. Higher resolution graphics are available. Today we used a combination of infrared, visible (chlorophyll + dissolved organic material (CDOM), RGB and SAR imagery from our system and our research partners (see Editors Note).

We were able to map the surface floating oil (olive green) with SAR imagery. The RGB data were not particularly revealing. We used our standard procedure of integrating the infrared (sea surface temperature) and ocean color (chlorophyll + colored dissolved organic material) to continue to follow the water that originated from the Deepwater Horizon oil spill. **TAKE NOTE AGAIN PLEASE THAT WE DO NOT KNOW WHAT IS CONTAINED IN THAT WATER MASS. We suspect that it has a mixture of subsurface oil (maybe oil droplets - maybe more congealed), water, tar balls, and dispersants. It is a critical issue that scientists with the correct equipment sample these areas shown as grey shapes close to the floating oil and farther away. Several independent laboratories should be used. It is also important that the results of these test be presented to the public immediately.**

The relatively large mass of surface oil continues to be in the vicinity of the Mississippi Delta and coastal waters and a substantial pool seems to be drifting farther westward. The ENVISAT SAR imagery shows the distribution. A narrow filament of this surface oil continues to be pulled to the counter-clockwise eddy located along the northern boundary of the Loop Current centered near 86°00'W & 27°30'N. Southwest of the Florida Panhandle the pool of unknown water is still being pulled away from land by the clockwise rotating eddy centered near 86°15'W & 29° 10'N. We have not received first hand information regarding the presence of surface oil in this water mass. The eastern boundary of the Loop Current over the west Florida continental shelf did not appear to move westward during the last 24 hours. Some finger shaped filaments of the mystery water continues their path southeastward and the leading filament (near 84°35'W & 27°10'N) is moving southward. This mystery water over the west Florida shelf is expected to be pulled in an offshore (southwestward) direction due to orientation and pull of the Loop Current over the next several days. Fishing action has been reported east of this area and along the eastern boundary of the Loop Current.

The counter-clockwise eddy centered near 88°15'W & 27°15'N) along the northwestern side of the Loop Current (is pulling the mystery water toward the Loop Current while the opposing eddy (near 89°30'W & 27°15'N) appears to be degrading as evidenced by the elongated shape. We anticipate that a substantial portion of this water will be pulled along the northern boundary of the Loop Current over the next several days.

The counter-clockwise eddy located along the southern and southeastern side of the Loop Current continued move more westward than southwestward during the last 24 hours which suggests to us that the Loop Current appears to be developing into an meso-scale "cutoff" eddy. The split current, some going northwestward and some going eastward toward the Straits of Florida continues and there is an impression that more water is flowing eastward at the surface than westward after it leaves the Yucatan Channel. Ocean color imagery this afternoon clearly shows this. It remains to be seen what the subsurface structure of the water is. But our opinion is that the Loop Current eddy development is substantially farther along today than yesterday. Take note that this does not guarantee a long-lived eddy or that the threat of oil, dispersants, tar balls reaching the coastlines of Florida, Cuba, or the Bahamas is over. There is a long time to go with this oil disaster. In the meantime enjoy the Florida Keys, all of the Florida, Bahamian and other beaches and water sports including fishing. We have been receiving reports of good fishing action from many areas in Florida and the Bahamas. Based on today's analysis it looks like we will have a great Memorial Day weekend next week. Don't forget we will help you find the concentrations of fish for your pleasure and consumption (if you so choose).

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/deepwaterhorizon.html>).

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/deepwaterhorizon.html>). We have many years of 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>).

