

ROFFER'S OCEAN FISHING FORECASTING SERVICE, INC.
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ROFFS™ FISHERIES OCEANOGRAPHIC SPECIAL ANALYSIS
FOR THE DEEPWATER HORIZON OIL SPILL AREA (LAT./LONG.)
UPDATED THURSDAY 13 MAY 2010 UPDATED AT 14:00 HRS

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 continue to use 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 and map the location of the oil. This work is a collaborative effort with the University of Miami and the Florida Institute of Technology along with other oceanographic professionals (e.g. Schaudt.US). 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 receive some of the imagery used to provide these analyses (MODIS sea surface temperature and ocean color) from University of South Florida/IMaRS. Today, we have added synthetic radar (SAR) satellite imagery thanks to the University of Miami to our repertoire of tools that we use to conduct these analyses. We continue to 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>).

We continue to monitor the conditions this week and we have updated this analysis using this morning's satellite imagery due to increasing cloud cover moving eastward towards the oil slick area. One must realize when evaluating visible (RGB) and synthetic aperture radar satellite imagery that the "visibility" of the oil is subject to effects of the angle of the satellite relative to the sun and Earth, as well as, shadow effects of clouds (RGB). Under some conditions the oil seems to disappear, but that is an effect of sun angle etc. Floating oil changes the surface properties of the water (surface tension) and synthetic radar (SAR) satellite imagery is not likely to detect tar, tar balls, or other oil byproducts that may be present in the water column itself. This is yet another reason why getting boats out onto the water to physically sample the water in the affected areas to look for tar and tar balls which may not have the same sheen and surface properties that are associated with the surface oil is critical.

We continue to observe the change in the circulation of the Loop Current and today we were able to observe the large counter-clockwise rotating eddy along the eastern side of the Loop Current centered near 85°15'W & 25°00'N. This feature continues to push the eastern wall of the Loop Current in a west/southwestward direction. It appears from our calculations and observations that the eastern edge of the Loop Current near 85°53'W & 25°00'N has moved approximately 35 miles southwestward in the past week. The west/southwestward motion of this eddy continues the formation of a large Loop Current eddy although we see no more indication of this in today's satellite imagery than we did in yesterday's satellite imagery. Although the HYCOM model forecast suggests otherwise, the conflict between the model and our observations based on real time satellite imagery and sequential image analysis suggests that the continued study of this eddy and the Loop Current is warranted.

Today we have displayed the oil observed with the RGB – visible imagery in an olive – brown color. This is based on yesterday's (12 MAY 2010) RGB imagery due to cloud cover over this area this afternoon. The grey area indicates where we suspect that surface oil and surface and subsurface oil – water by-products have moved to based on following the water masses associated with the relatively cooler temperatures that were upwelled from subsurface water by the oil and from ocean color imagery including the artifacts in the derived chlorophyll imagery. Our ROFFS analyses suggest that the offshore segments of the oil continue to move further offshore as pulled by several interacting current regimes. However, it does appear as if its interaction with the Loop Current continues to degenerate the eddy centered near 88°05'W & 27°25'N causing some of the oil near 87°37'W & 27°16'N and 87°43'W & 27°42'N to continue to be pulled east/southeastward towards the Loop Current. It remains to be seen if and when this oil will reach the circulation of the Loop Current mainly due to a large counter-clockwise eddy forming near 86°40'W & 27°50'N. South of Louisiana, the area of suspected oil continues to be pulled in a clockwise direction around the main eddy which is centered today near 89°15'W & 27°45'N. Today it appears as if this oil is moving north/northeastward along the western side of the eddy near 89°30'W & 28°00'N. Please note that earlier in the week we did receive several anomalous AXBT readings from University of Miami (RSMAS) and Nick Shay near 88°30'W & 28°24'N, 88°30'W & 28°00'N, and 88°30'W & 27°30'N. ROFFS is interpreting this as a confirmation of a contamination of oil at these locations.

Northeast of De Soto Canyon we continue to observe a counter-clockwise rotating eddy centered near 86°35'W & 29°30'N that continues to pull some of the observed oil near 87°40'W & 29°05'N and some of the suspected oil-water mixture in an eastward direction to near 86°15'W & 29°15'-20'N. Today, this eddy appears to be degenerating and it remains to be seen if this oil will begin to drift southeastward along with the surface currents or move slowly northwestward due to the weak circulation of the eddy and the current wind state. The currents northward and eastward towards Cape San Blas are not supportive of moving the main portion of the oil towards the Florida Panhandle at the present time.

Westward, south/southwest of the South Pass, Louisiana area we continue to observe a thin (3-5 mile wide band) of suspected oil/water mixture that had been moving slowly westward. We believe that this had been due to the direction and speed of the winds in this area; however today it

appears as if the tip of the oil near 90°30'W & 28°10'N has ceased its west/southwestward motion and may be beginning to move slowly east/northeastward along with the surface currents as expected.

See enclosed PDF analysis as the graphic is enclosed. Higher resolution graphics are available.

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. ROFFS™ would be appreciative if you would copy this analysis to others who may be interested in our efforts.

