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ROFFS™ OCEANOGRAPHIC ANALYSIS FOR THE DEEPWATER HORIZON OIL SPILL AREA
UPDATED MONDAY 28 JUNE 2010 (18:O0 HRS)

See enclosed PDF analysis as the graphic is enclosed. We continue to monitor the conditions in the Gulf of Mexico and east coast of Florida. As customary with these analyses we have stamped the initials "WOM" in the areas that there is likely to be some water-oil-dispersant mixture at the surface and subsurface of the ocean. We have outlined in grey the tendril that we have maintained visual contact with the water masses without major interruption. The WOM is the water, in some dilute form, that originated at the Deepwater Horizon oil spill site. Today's analysis uses infrared and ocean color satellite data during the June 24-27, 2010 period. The infrared data from June 24-27 were used to derive the background sea surface image and ocean frontal analysis. The ocean color image was derived from June 23-26 data received from our collaborators from the Univ. South Florida IMaRS. Today there was no useful infrared or ocean color data due to the clouds. The synthetic aperture radar (SAR) data were derived from the June 22-28 period from our collaborators at the Univ. Miami CSTARS and ESA.

We have observed changes in the distribution of the surface oil (olive green area) since our last public analysis on June 22, 2010. The surface oil has moved westward to the Mississippi Sound area, as well as, farther into the Barataria Bay, LA. This is probably due to the wind forcing the oil (mostly from the southeast). However, note that the surface oil appears to be absent in the area east and south of the Deepwater Horizon spill site. The currents over De Soto Canyon have been from the southeast in part from the wind, but also due to the flow of the water associated with the cyclonic (counter-clockwise eddy) west-southwest of Tampa. The center of circulation of the eddy is now near 85°45-55''W & 27°00'N. The surface oil does not appear to have moved south-or southeast from the Florida Big Bend area (near 85°00'W & 29°45'N). The oil-water dispersant mixture south of the South Pass, LA area (near 89°00'W & 28°30'N) is has moved west-northwestward.

The situation with the Loop Current eddy "Franklin" appears to be forming into a more "ear-like" shape. The clockwise circulation appears to be centered approximately near 87°30'W & 25°30'N. It continues to interact with the cyclonic eddy (centered near 85°45-55''W & 27°00'N). The cyclonic eddy continues to pull water from eddy Franklin. This Loop Current water centered near 85°00''W & 25°30'N is also being pulled south-southwestward by eddy Franklin. To complicate matters more the Loop Current is still interacting with these water masses and the relatively cooler water with higher relative chlorophyll (green – blue/green color) from the Yucatan area is being pulled northeastward until it reaches the area of influence by eddy Franklin. This interaction has resulted in yet another cyclonic eddy being formed with a center of circulation near 85°45'W & 23°45'N. We will have a Quicktime™ movie of the ocean color imagery on our website later today or tomorrow morning which demonstrates this motion.

The water-oil-dispersant mixture that is over the west Florida continental shelf in the form of three tendrils continues to move southward. One of the tendrils continues to circle eddy Franklin, while another one seems to be moving more southward and may be pulled southeastward by the Loop Current flow. This is an important area of interest since it is still not known if the Loop Current is truly separated from the blue water masses north and northwest. The NOAA vessel Nancy Foster will be traveling to this week to this area to investigate the circulation - distribution of water masses. We are working collaboratively with NOAA Atlantic and Meteorological Laboratories (AOML) on this research cruise and will continue to work with NOAA_AOML during the coming months.

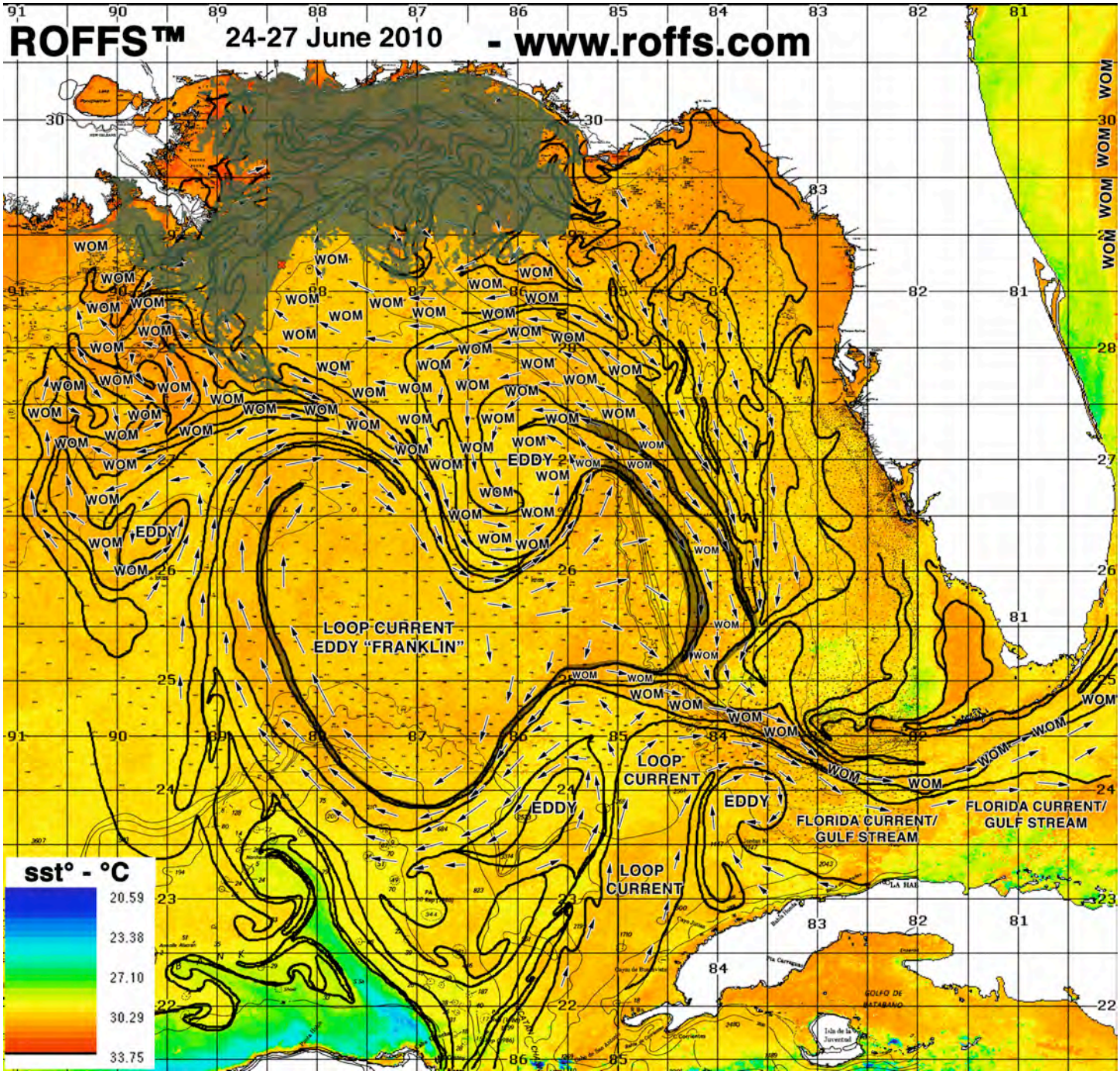
EDITORS NOTE:

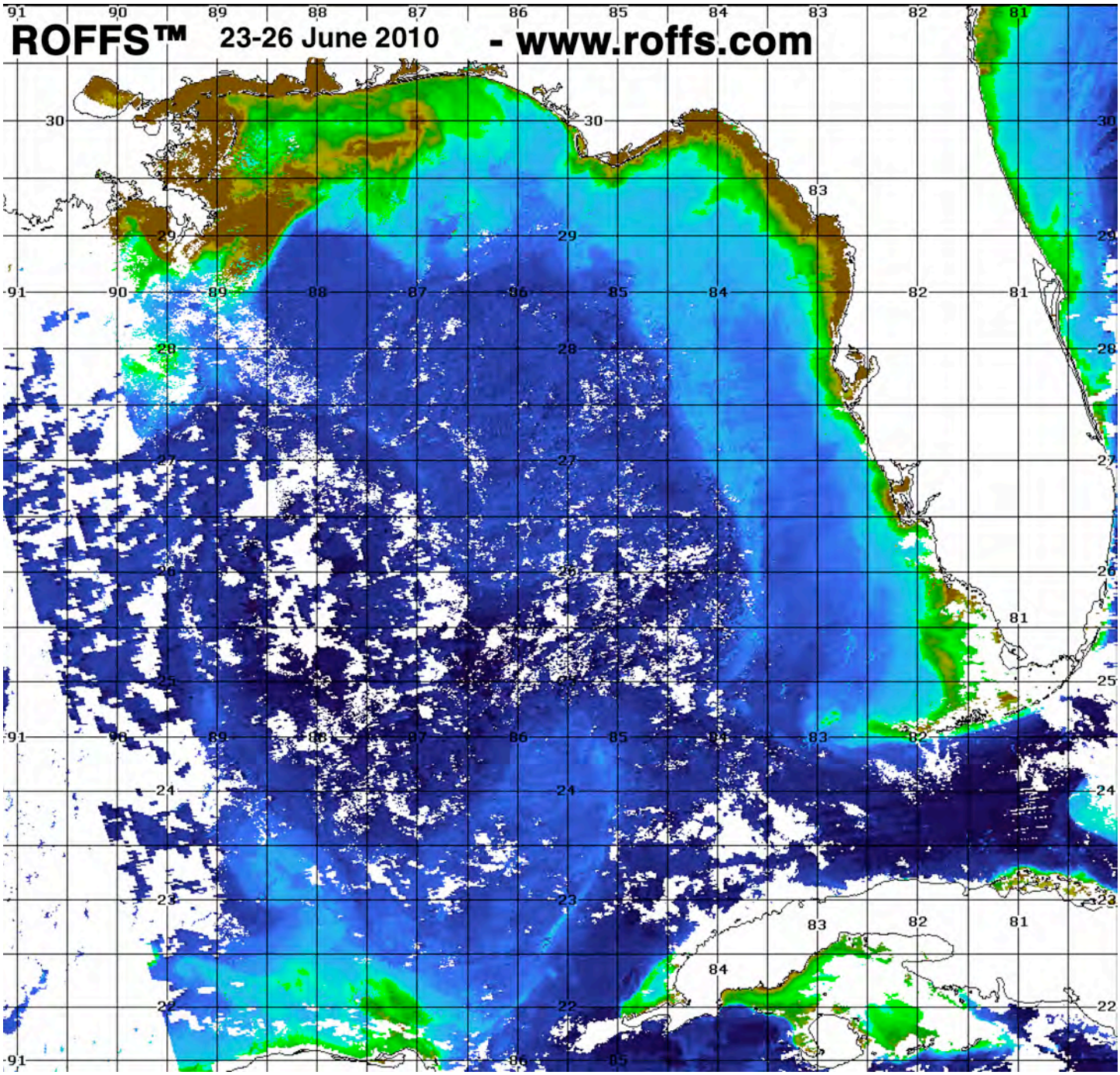
While we have been conducting these analyses as a civic duty and as an exercise in technology transfer, we would like to be contracted to do this to support cleanup, restoration, and litigation, as well as, ecosystem research efforts. If you plan to use these reports including the graphics you must give 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 also have a collaborative effort between ROFFS™ and NOAA/AOML.

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 is an ocean color image derived from NASA MODIS data provided by USF IMaRS from June 23-26, 2010.