

# Oil Spill Tracking in the Eastern Gulf of Mexico

**Robert H. Weisberg**

*Distinguished University Professor*

*Professor of Physical Oceanography*

with

**Drs. Y. Liu and L. Zheng, Prof. C. Hu, & the OCG**

*College of Marine Science*

*University of South Florida*

*and assistance from the HYCOM consortium*

**May 17, 2010 Preliminary Results.**

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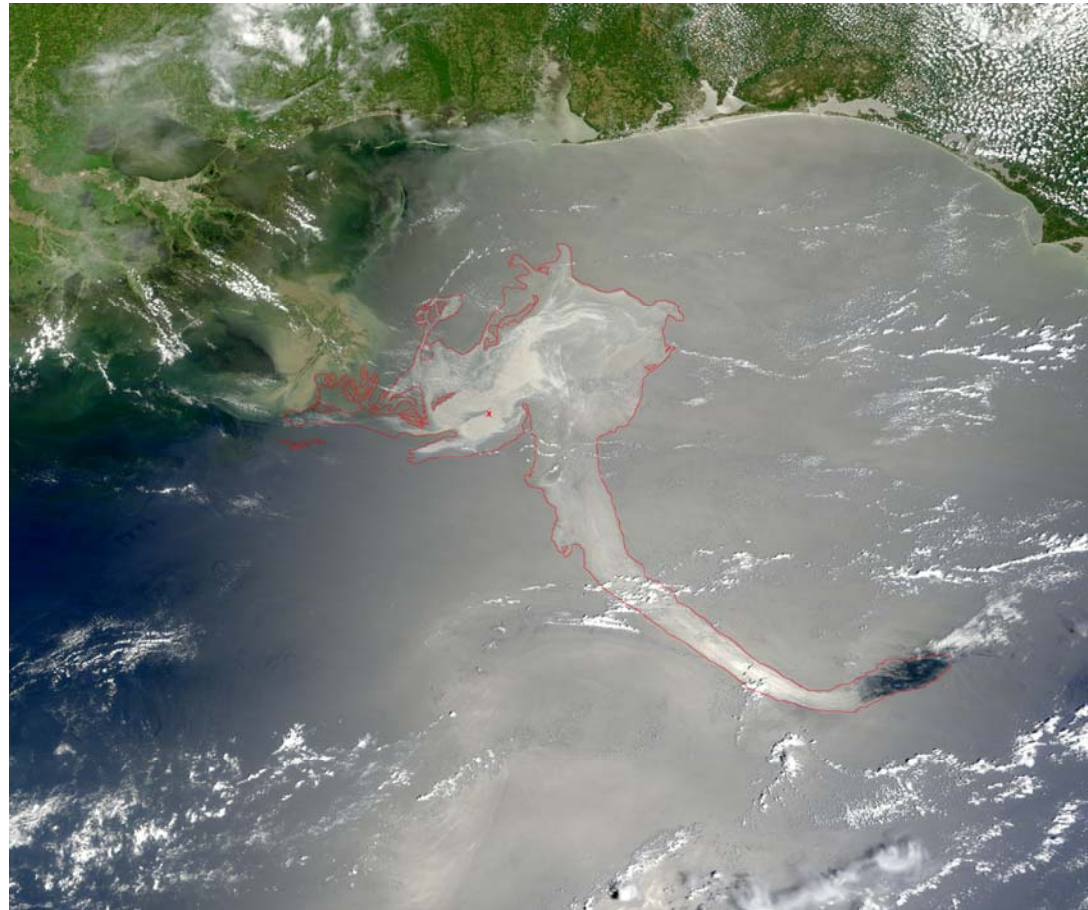
# Oil Spill Tracking in the Eastern Gulf of Mexico

**Initialization on 5/17**  
**Predictions through 5/20**

We are applying five different models for tracking oil spilled from the Macondo Well: (1) USF ROMS nested in Global HYCOM, (2) Global HYCOM, (3) Navy GOM HYCOM, (4) NCSU SABGOM, and (5) NOAA RTOFS. For each, we initialize the oil patch using satellite imagery, and simulate the movement of surface particles carried by the model's velocity fields. Simulations include periods of both hindcast and forecasts (using NOAA forecast winds). Results are shown at common times. We also include comparisons of predictions with observations when satellite imagery is available.

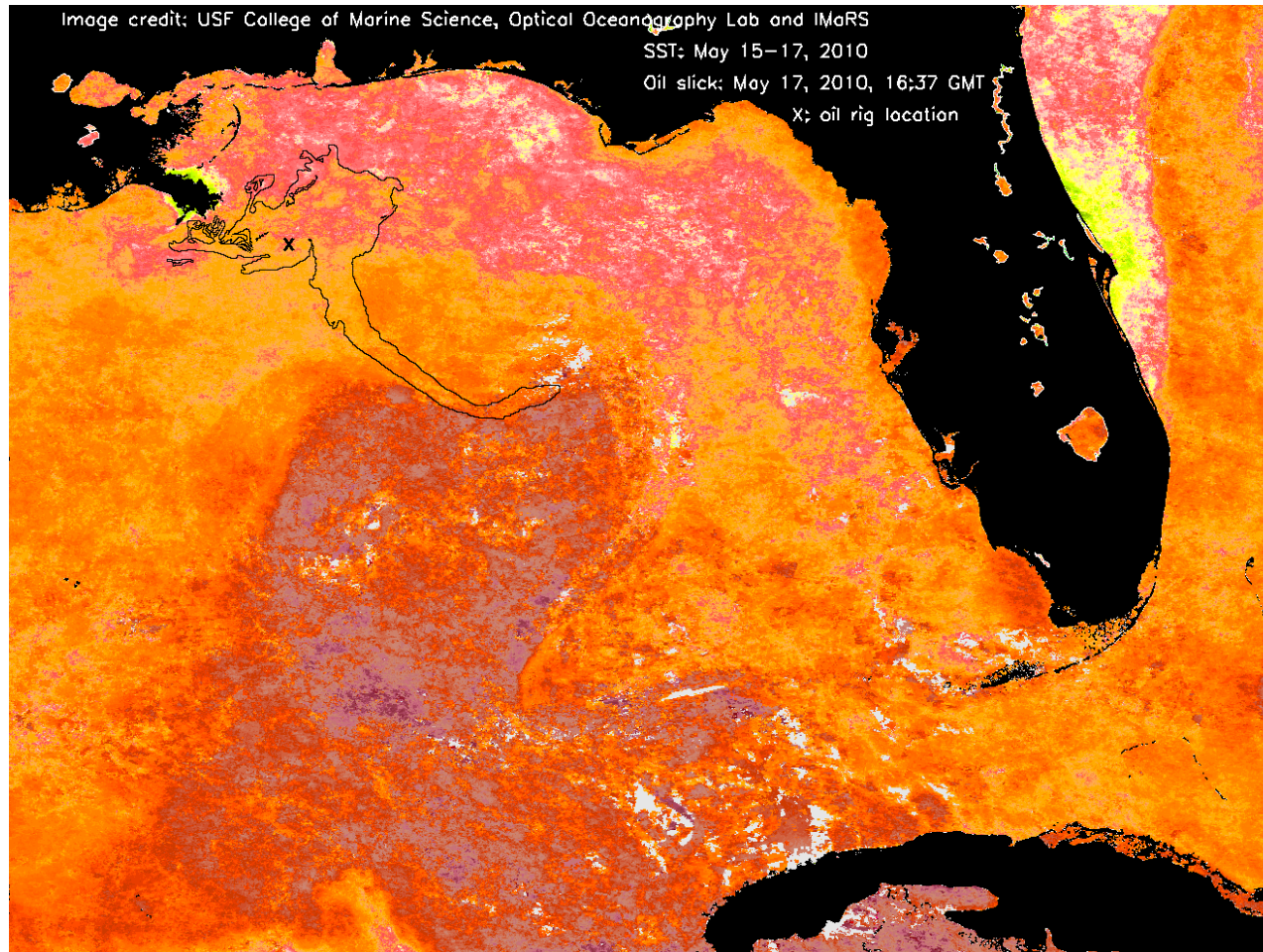
The latest trajectory forecast from all the models can be interactively viewed from <http://ocgweb.marine.usf.edu/>

## MODIS Satellite Imagery (05/17, 16:38 UTC)



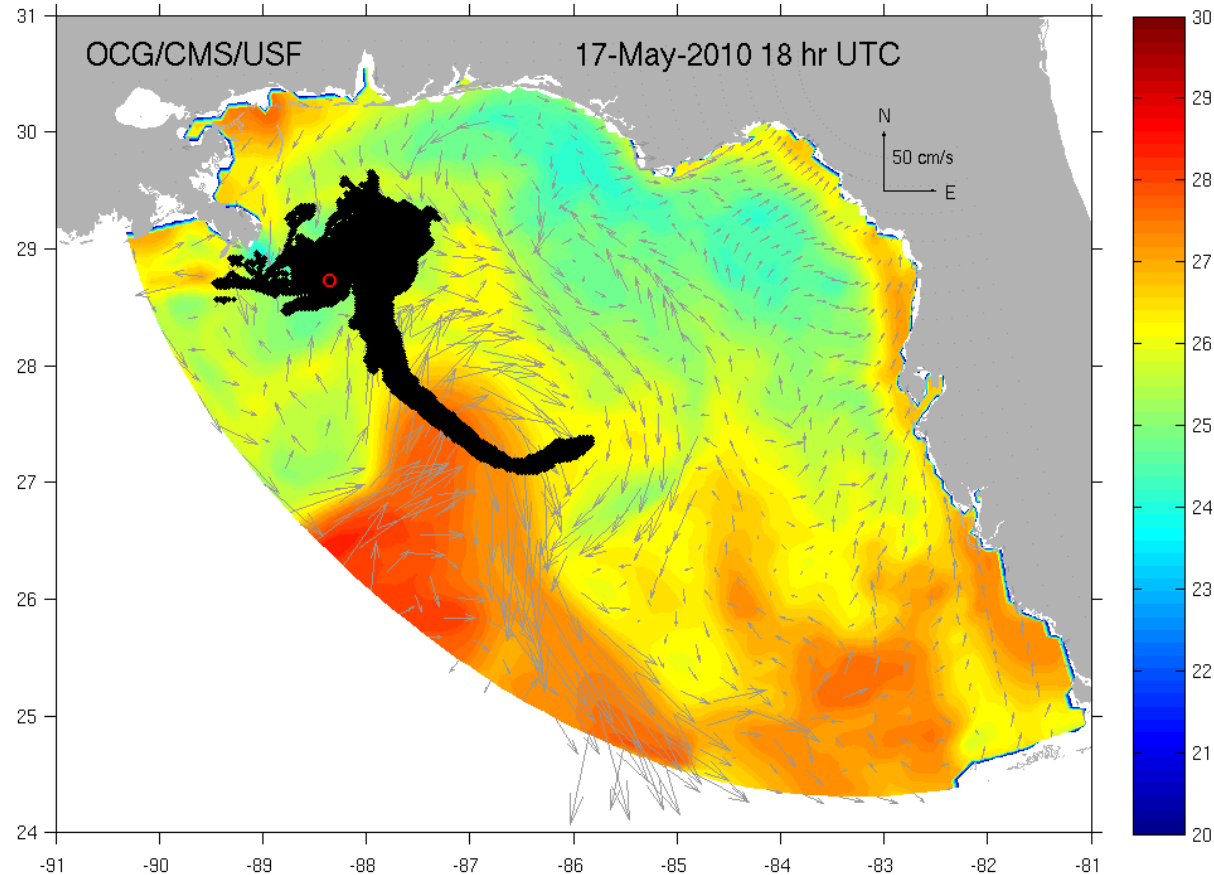
The outlined area is the oil slick as seen from today's satellite imagery. The feature of the long branch of oil slick extending to the south validated our previous model forecast based on 05/15 initialization. Our predicted "very likely" pattern becomes reality. Check our previous forecast at <http://ocgweb.marine.usf.edu/~liu/oil.html>. This satellite imagery is used to initialize our oil spill trajectory models.

# Oil slick Superimposed on Sea Surface Temperature



The dark red area indicate the Loop Current water, which is warmer than the ambient water in the Gulf of Mexico. The oil spill has been entrained in the Loop Current or at least on the edge of the Loop Current.

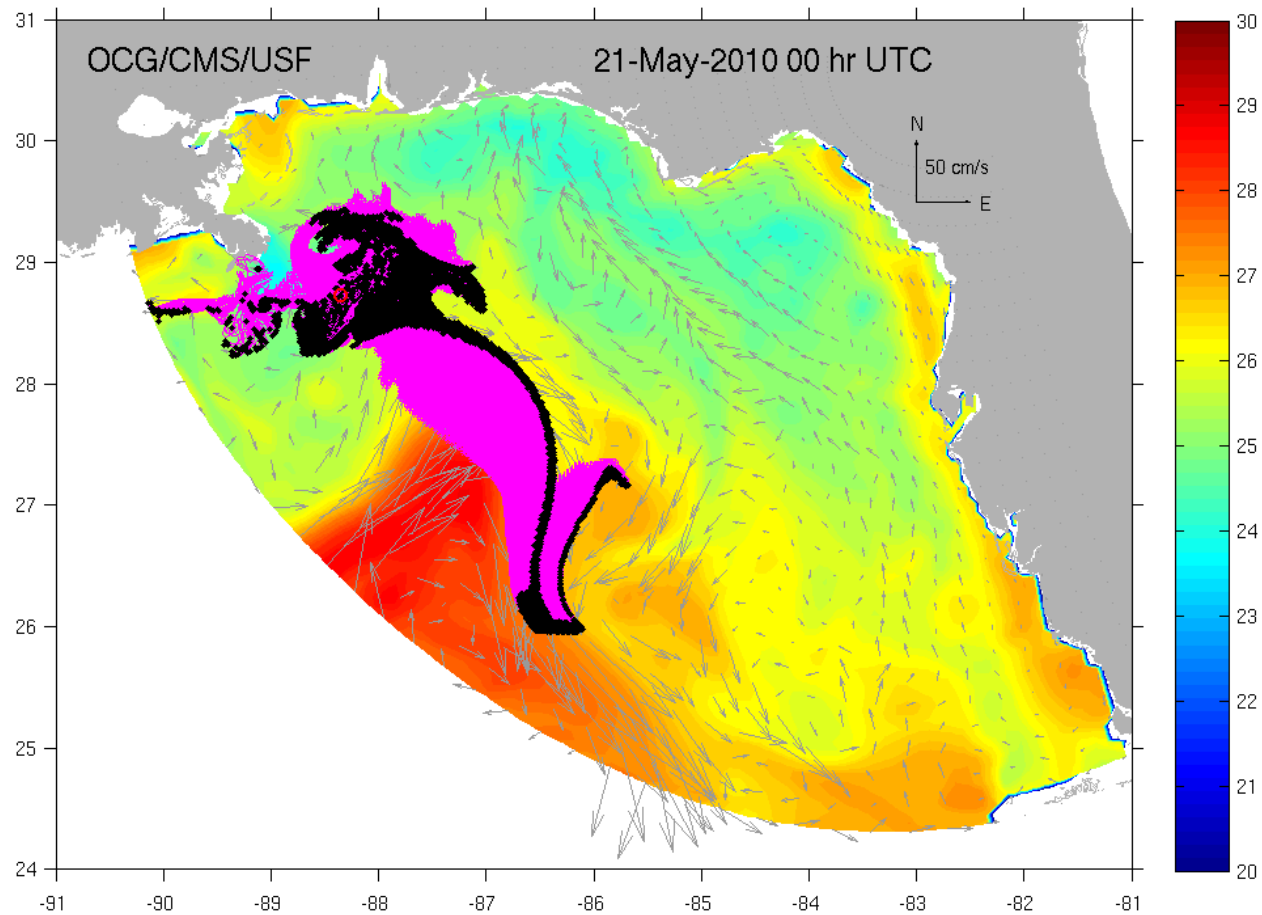
# USF WFS Nowcast/Forecast Model



Using 3-hourly USF WFS model results we estimate trajectories emanating from the spill site by releasing new particles every 3 hours starting from a 05/17 spill initialization using sat. imagery.

<http://ocgweb.marine.usf.edu>

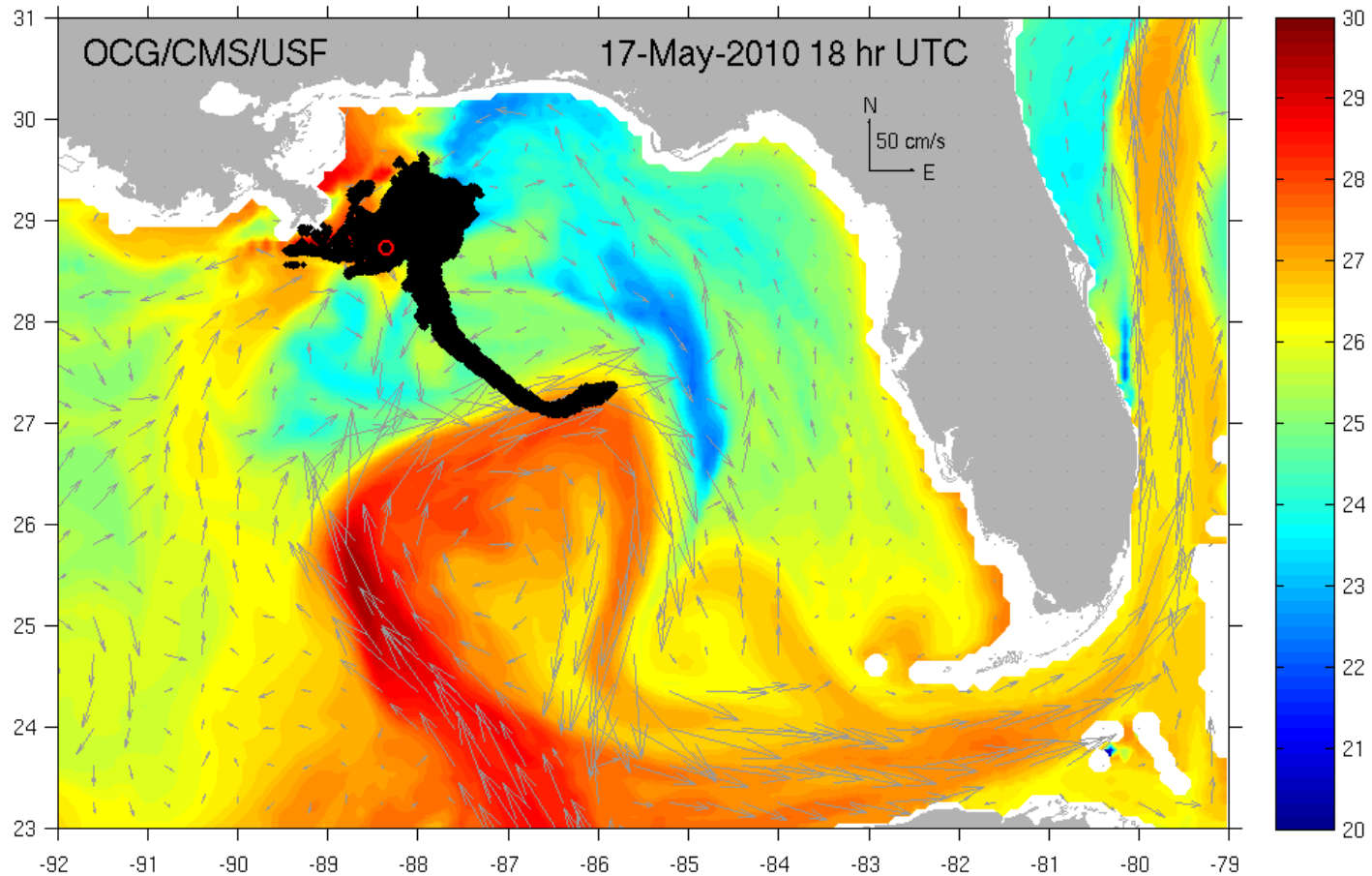
# USF WFS Nowcast/Forecast Model



**Hindcast/forecast for 5/20 using 3-hourly USF WFS model results to estimate trajectories emanating from the spill site by releasing new particles every 3 hrs starting from a 05/17 sat. imagery spill initialization.**

<http://ocgweb.marine.usf.edu>

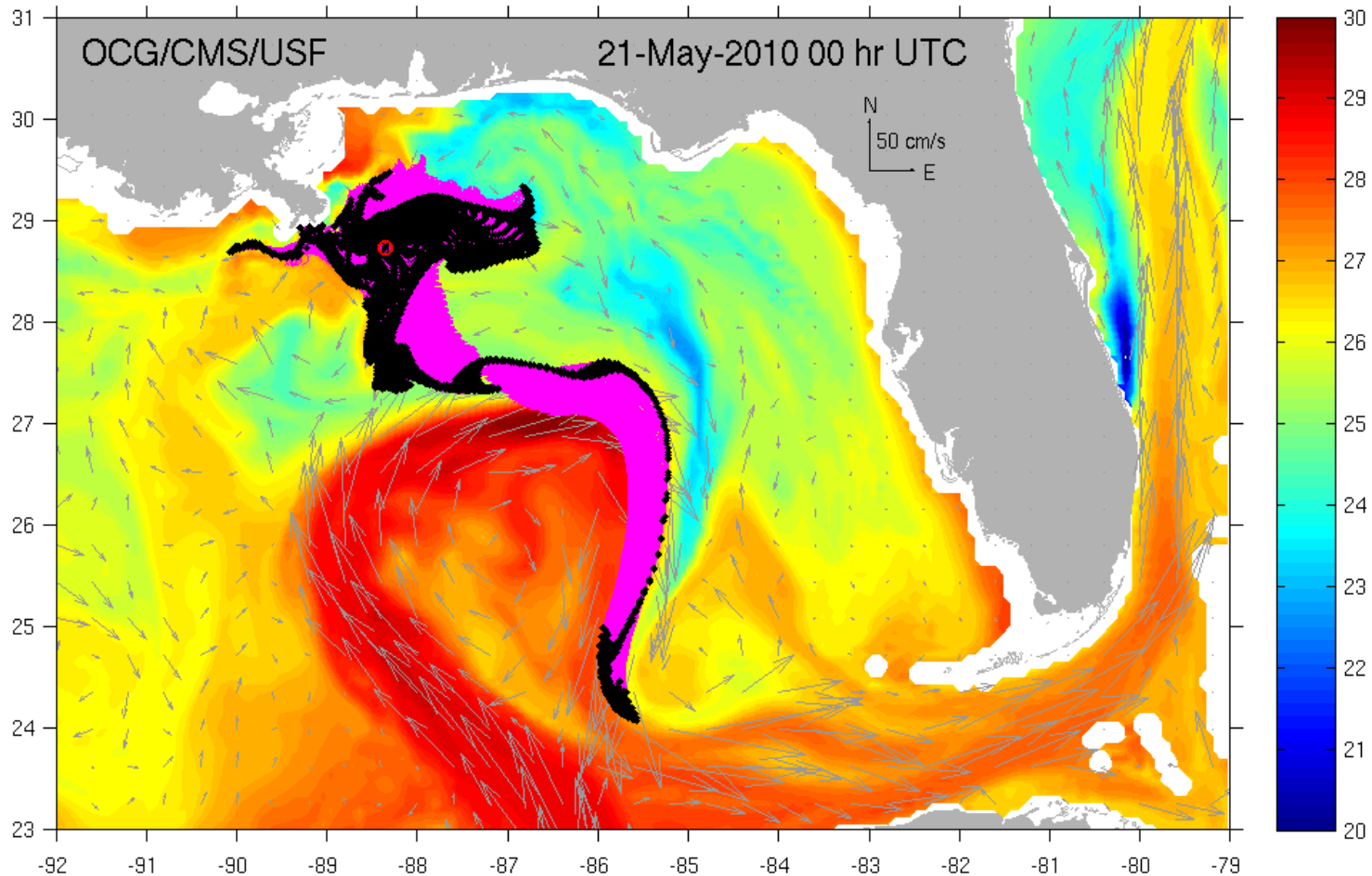
# Global HYCOM Nowcast/Forecast



Using daily Global HYCOM results we estimate trajectories emanating from the spill site by releasing new particles every 3 hours starting from a 05/17 spill initialization using sat. imagery.

<http://ocgweb.marine.usf.edu>

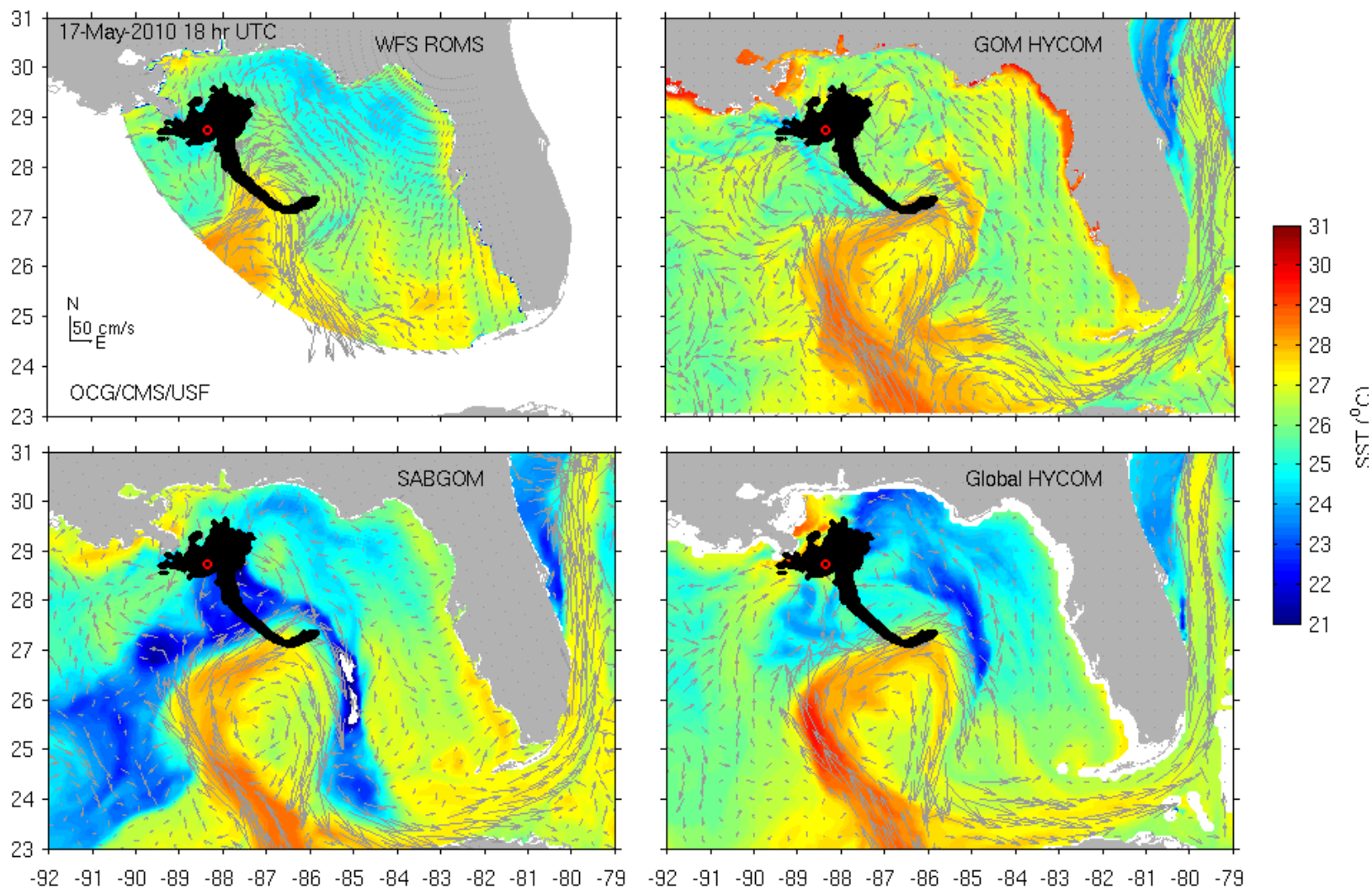
# Global HYCOM Nowcast/Forecast



**Hindcast/forecast for 5/20 daily Global HYCOM results to estimate trajectories emanating from the spill site by releasing new particles every 3 hrs starting from a 05/17 sat. imagery spill initialization.**

<http://ocgweb.marine.usf.edu>

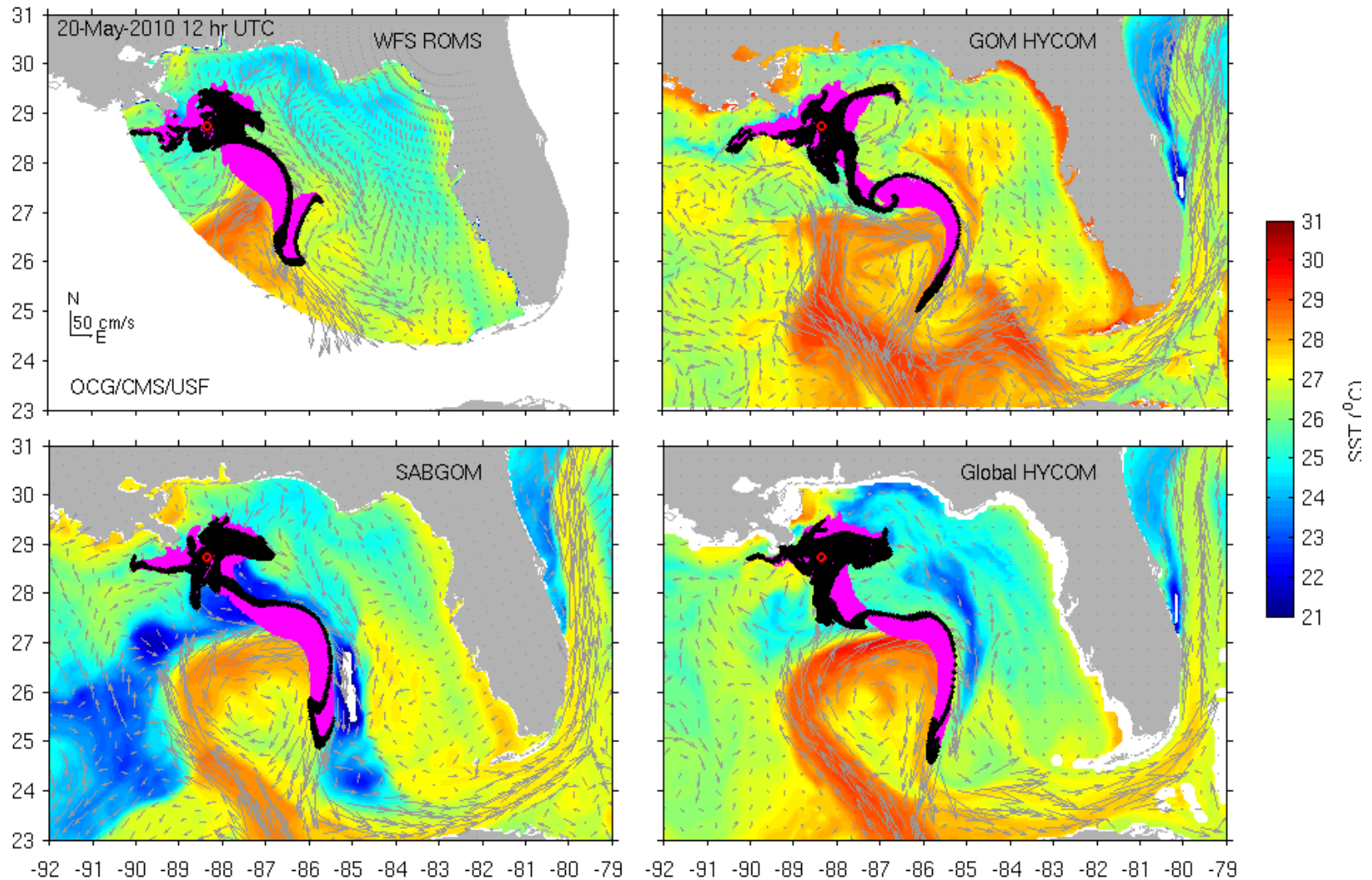
# Ensemble Forecast from Four models



Using 3-hourly trajectory model results we estimate trajectories emanating from the spill site by releasing new particles every 3 hours starting from a 05/17 spill initialization using sat. imagery.

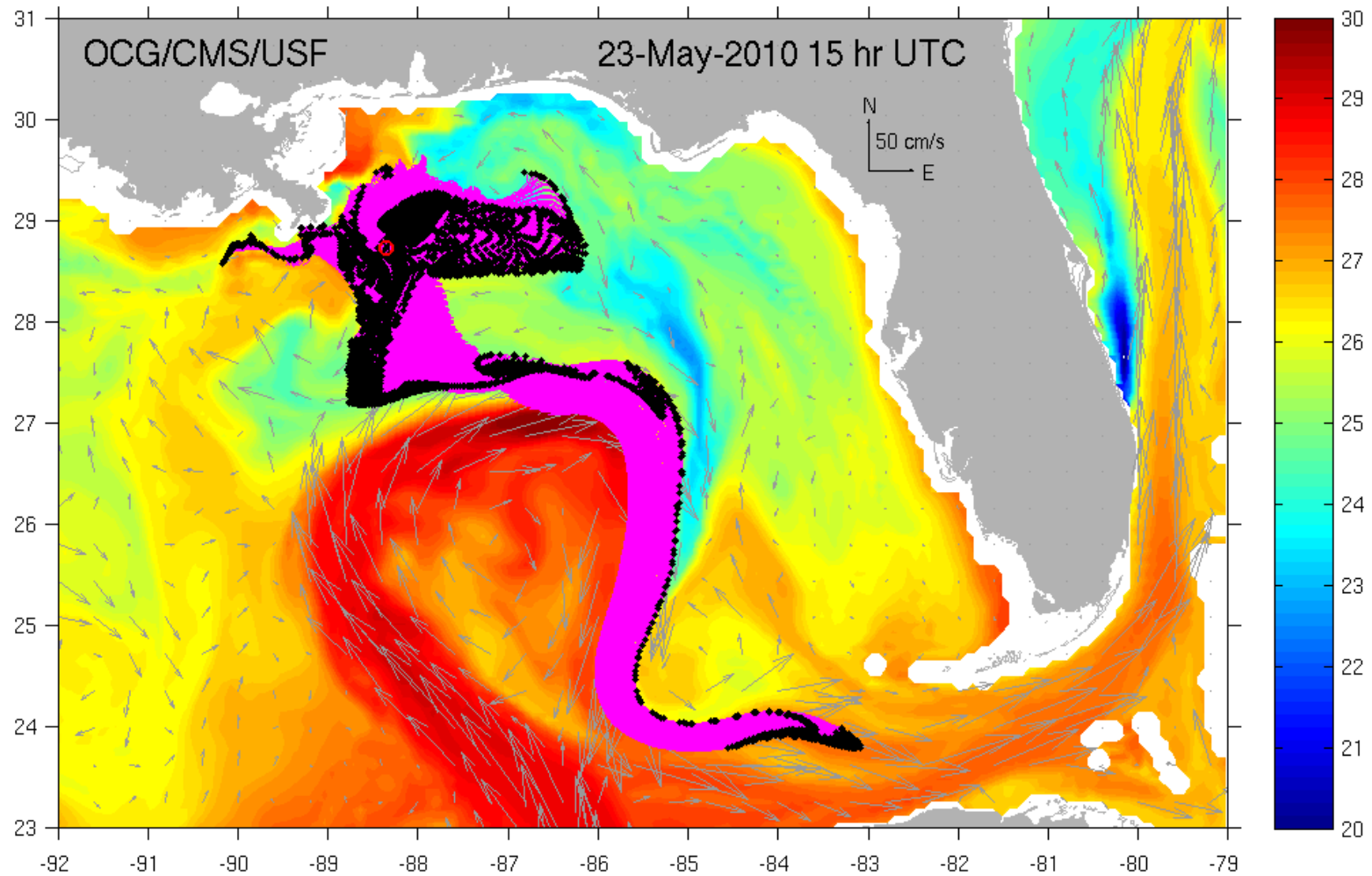
<http://ocgweb.marine.usf.edu>

# Ensemble Forecast from Four models



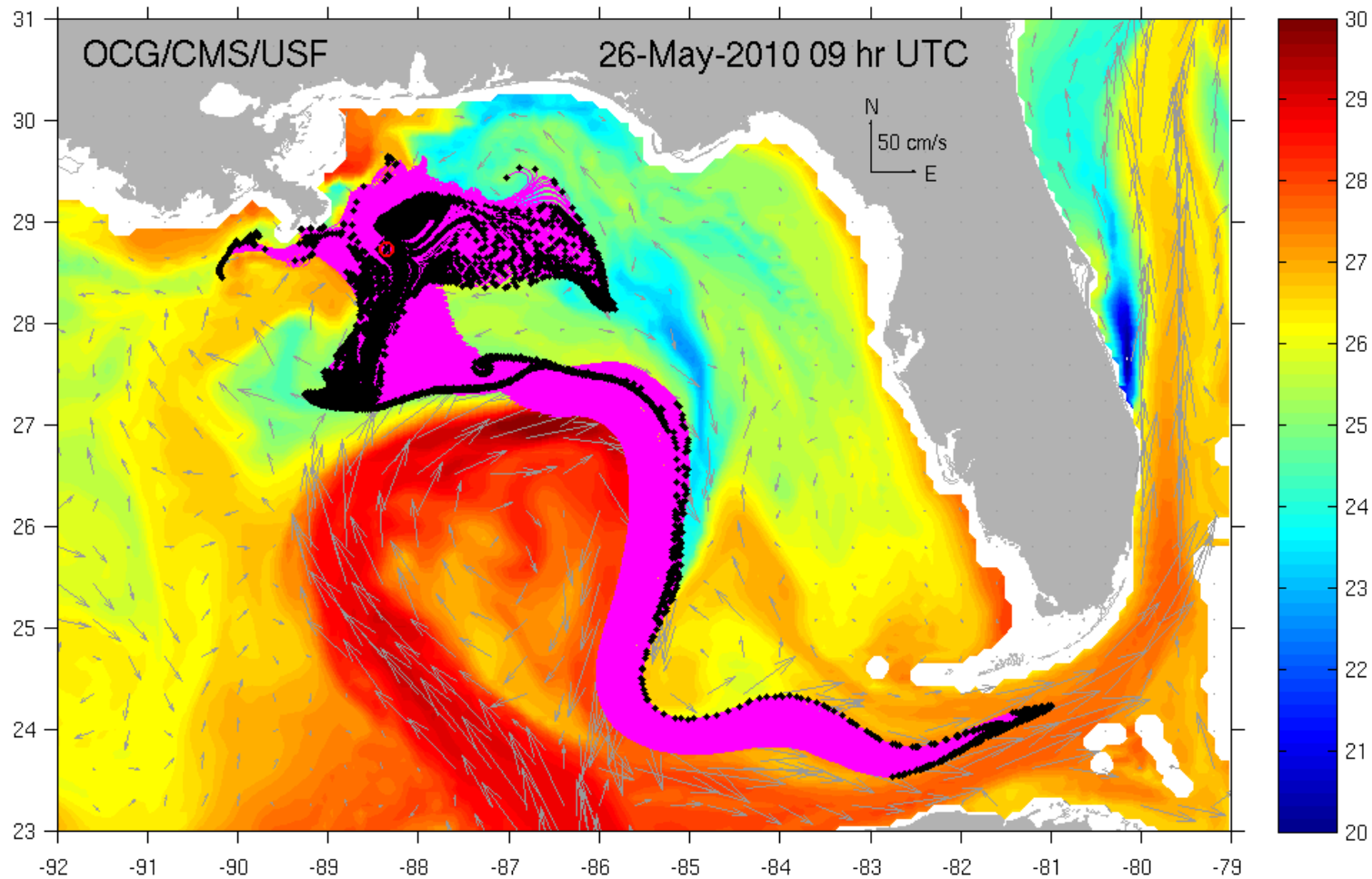
**Hindcast/forecast for 5/20 using 3-hourly trajectory model results we estimate trajectories emanating from the spill site by releasing new particles every 3 hours starting from a 05/17 spill initialization using sat. imagery. <http://ocgweb.marine.usf.edu>**

## When will the oil spill be transported to the Florida Keys area?



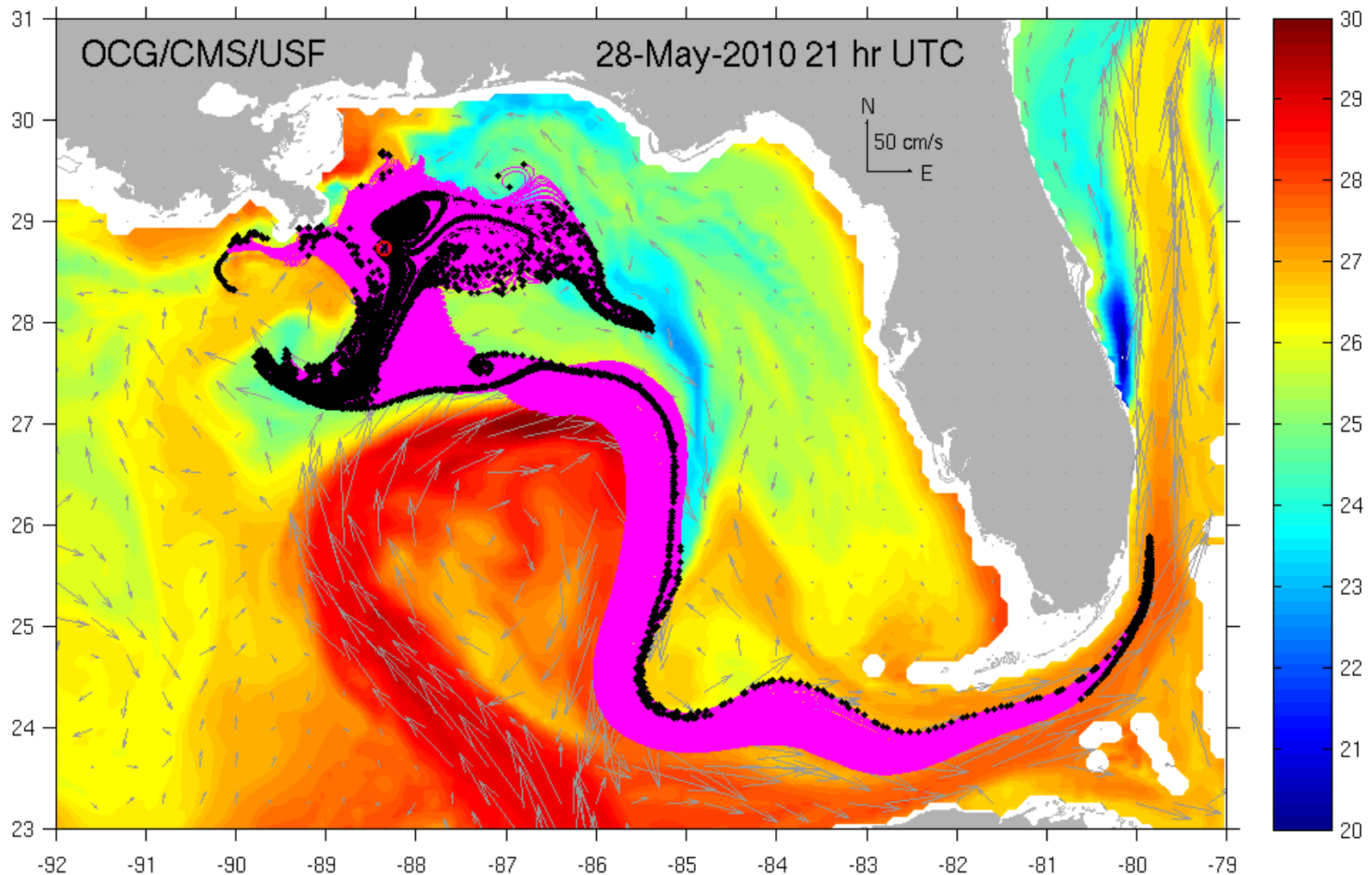
**Assuming persistence of the Loop Current as predicted for 05/21 (the last forecast from the Global HYCOM), and neglecting the dispersion and evaporation of the oil spill, the forefront of the oil slick may reach Florida Key West area on 05/23 ~ 05/24.**

## When will the oil spill be transported to the middle Keys area?



**Assuming persistence of the Loop Current as predicted for 05/21 (the last forecast from the Global HYCOM), and neglecting the dispersion and evaporation of the oil spill, the forefront of the oil slick may reach middle Keys area in the Florida Strait around 05/26.**

## When will the oil spill be transported to the Miami area?



**Assuming persistence of the Loop Current as predicted for 05/21 (the last forecast from the Global HYCOM), and neglecting the dispersion and evaporation of the oil spill, the forefront of the oil slick may reach Miami area around 05/28.**

# Summary

The southern arm of oil slick has already been entrained, or at least on the edge of, the Loop Current (LC) as show from today's satellite imagery. All the five model trajectory forecast (WFS ROMS, Global HYCOM, Navy GOM HYCOM, SABGOM, and RTOFS) show that this southern part of the oil slick will be transported along with the LC. Our best estimate of the arrival dates of the oil spill, transported along with the Loop Current, for the Key West, middle Keys, and Miami are around 05/23~24, 05/26, and 05/28, respectively.

The main body of the oil slick is still near the sunken rig site. Based on a 5/17 re-initialization of oil location and 5/20 forecast it does not appear as if oil will reach any Florida beaches in the next 2 days. However, the forecast winds will be SWW during the next two days. We will watch whether the oil spill can be transported to Florida coasts after 05/20.

**Observations, models, analyses at: <http://ocgweb.marine.usf.edu>**

*Dr. Weisberg is on travel until next week. Please contact with Dr. Yonggang Liu for any questions or comments: [yliu@marine.usf.edu](mailto:yliu@marine.usf.edu), 727-553-3508 (phone).*