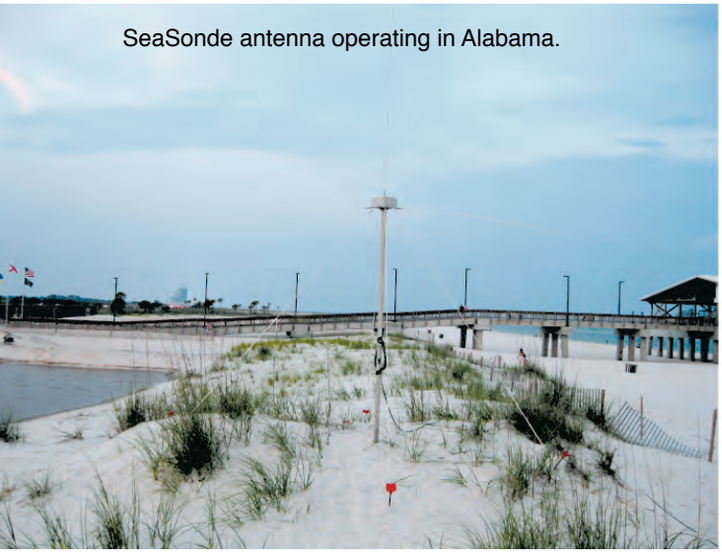
SeaSondes Play Role in Gulf of Mexico Disaster Response

The BP Deepwater Horizon oil rig ablaze. Image credit: U.S. Coast Guard.

Five years after Hurricane Katrina's wrath was felt by residents in the Gulf of Mexico, the area now faces another disaster. On 20 April 2010 the explosion on Deepwater Horizon oil rig set into motion the oil leak that flowed until 15 July and is now on record as the largest oil spill in U.S. history. Its impacts as well as required cleanup and remediation will continue for years.

Within days of the explosion, CODAR engineers worked alongside scientists at University of Southern Mississippi to complete installation of their 3 Long-Range SeaSonde radars and mobilize this network so that it would provide coverage of the surface currents from Mississippi as far east to Pensacola, Florida.



SeaSonde antenna operating in Alabama.

Data from this network, and another Long-Range SeaSonde network positioned along the west Florida shelf (owned and operated by University of South Florida), were loaded hourly into the US IOOS national HF radar network database and from there used by NOAA scientists alongside their models of circulation and oil transport in the Gulf.

A wider swath of scientists used this data and that from Rutgers University underwater glider fleet to compare with and to analyze the utility of the HyCOM and SABGOM models running in the Gulf.

While ocean circulation in the deep water areas of the Gulf can be resolved with confidence using satellite-derived data, the current circulation patterns on the shallower shelf areas are poorly observed by satellite as these areas are influenced less by geostrophic and tidal effects, but more by winds, bathymetry, and river discharge. These influences reduce the effectiveness of satellite-derived current information while emphasizing circulation nowcasts and forecasts that input data over the continental shelf. SeaSonde HF radar current patterns are the most obvious and critical nowcast observations that satisfy this need.

NEWS COVERAGE

Considerable press has been given to the use of SeaSondes in the Gulf of Mexico response. Of the writings, we especially like that article written by Paul Voosen which appeared in the New York Times online. It can be found at:
http://www.nytimes.com/gwire/2010/06/03/03greenwire-federal-funding-cuts-leave-oceanographers-spil-74436.html?pagewanted=all

The New York Times

At left: San Francisco State University's Jim Pettigrew explains to NBC Bay Area news reporter Vicky Nguyen the basics of how HF radar works, how it can help in the Gulf response effort, and also the incredible SeaSonde coverage along California's coastline that represents the world's most extensive HF radar network. The news video segment can be accessed via a link on the CODAR company home page at www.codar.com.

The website specially devoted to U.S. IOOS' disaster response in the Gulf of Mexico (entry portal http://rucool.marine.rutgers.edu/deepwater/) contains arguably the best collection of oceanographic information and analysis available for public viewing. We call special attention to the **Deepwater Blog** section (direct link is http://rucool.marine.rutgers.edu/deepwater/category/deepwater-blog/). Of the 127 postings made thus far, there are simply too many interesting entries involving SeaSonde data to list. So, instead we show below an excerpt from the blog dated 4 June 2010, (posted by Dr. Scott Glenn of Rutgers University) illustrating one specific example how SeaSonde data is being used.
The blog is posted online at http://rucool.marine.rutgers.edu/deepwater/category/deepwater-blog/page/8/

DEEPWATER HORIZON OIL SPILL
IOOS Response to BP Spill in the Gulf of Mexico

HF Radar tells the story for the Florida Coast.

June 4th, 2010 scott

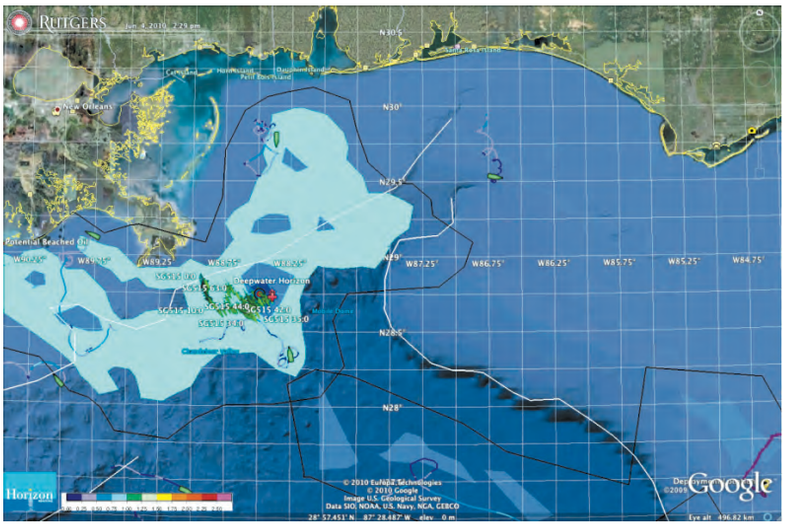


Figure 1. This is the NOAA Oil Spill Forecast for June 3. The oil that is north of the Deepwater Horizon site was located directly south of the Mississippi/Alabama border, directly south of Mobile Bay. Very little is south of the Alabama/Florida border.

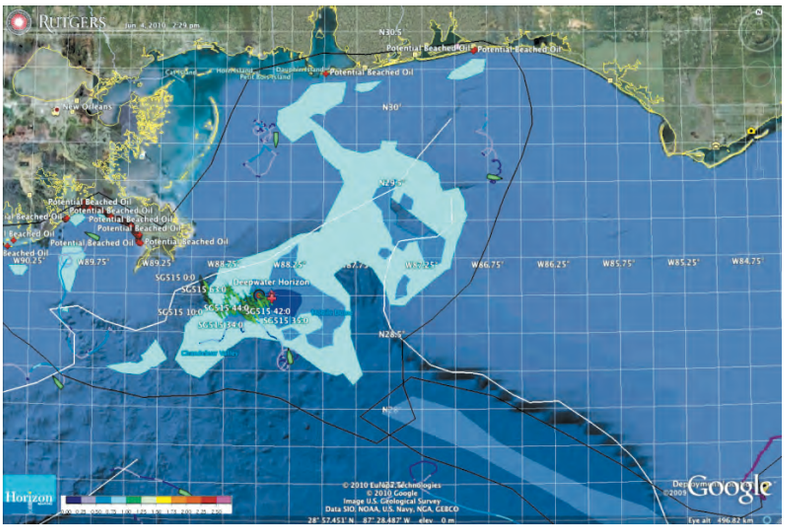


Figure 2. Here is the NOAA oil spill forecast forecast for June 4. There is a significant eastward shift in in the highest oil concentrations shown in the blue colors. The black line showing the outer boundary has shifted significantly to the north and east, making landfall in Alabama and Florida.

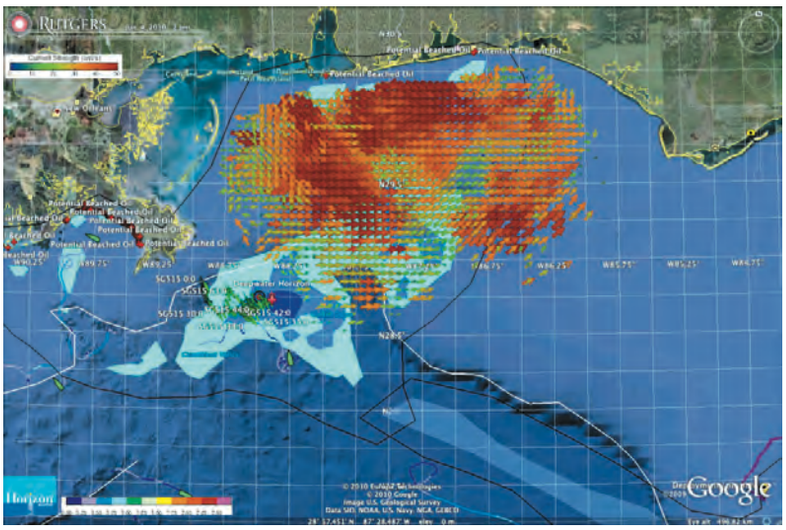


Figure 3. Now we overlay the surface current maps from the National HF Radar network. The shore-based radar systems are observing strong currents generally to the east. West of Mobile Bay, the strong currents are running to the southeast, moving the oil slick away from the Mississippi coast. East of Mobile Bay, the currents turn, heading northeast, toward the Florida coast, exactly how the oil is moving. The HF Radars are showing us where the oil is going and why. No wonder the U.S. Coast Guard uses HF Radar for Search And Rescue.

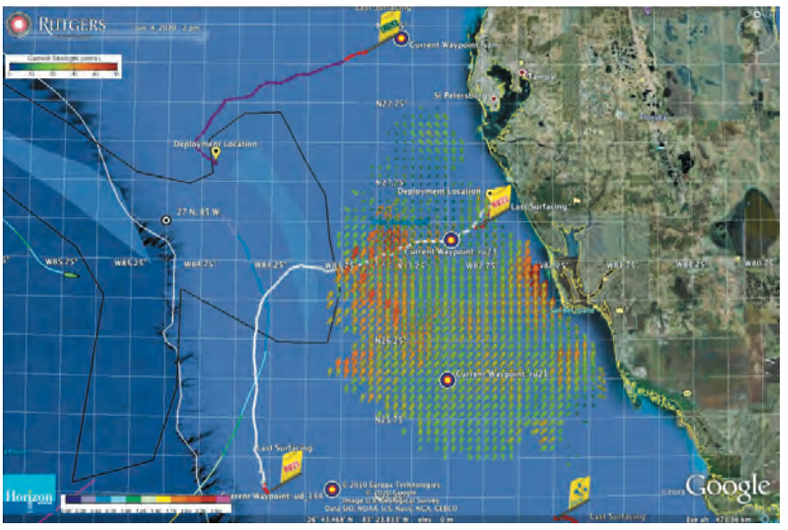


Figure 4. Now here is the HF Radar surface current map from the Florida shelf south of Tampa. The oil slick is just making it into the coverage area for these HF Radars. Currents here are alongshore generally to the north. The outer edge closest to the oil is heading northeast towards Tampa, but the currents closer in are running parallel to the coast.