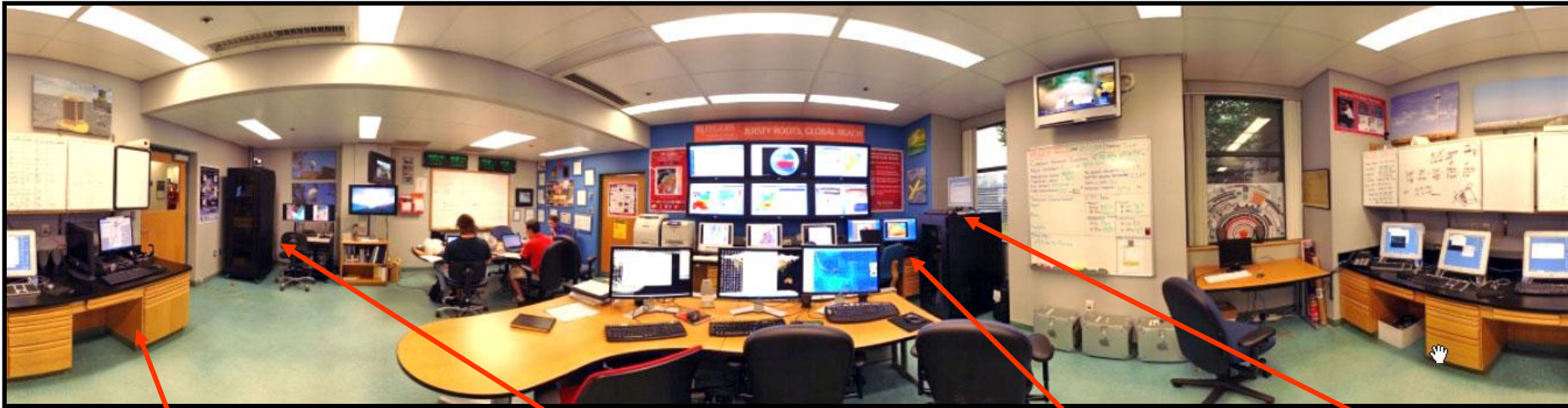


Coordinated Response to the Deepwater Horizon Oil Spill

Rutgers University - Coastal Ocean Observation Lab



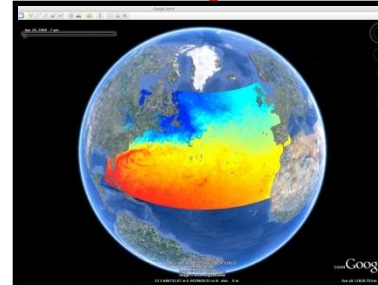
CODAR Network



**L-Band & X-Band Satellite
Receivers**



**3-D Nowcasts
& Forecasts**



Glider Fleet



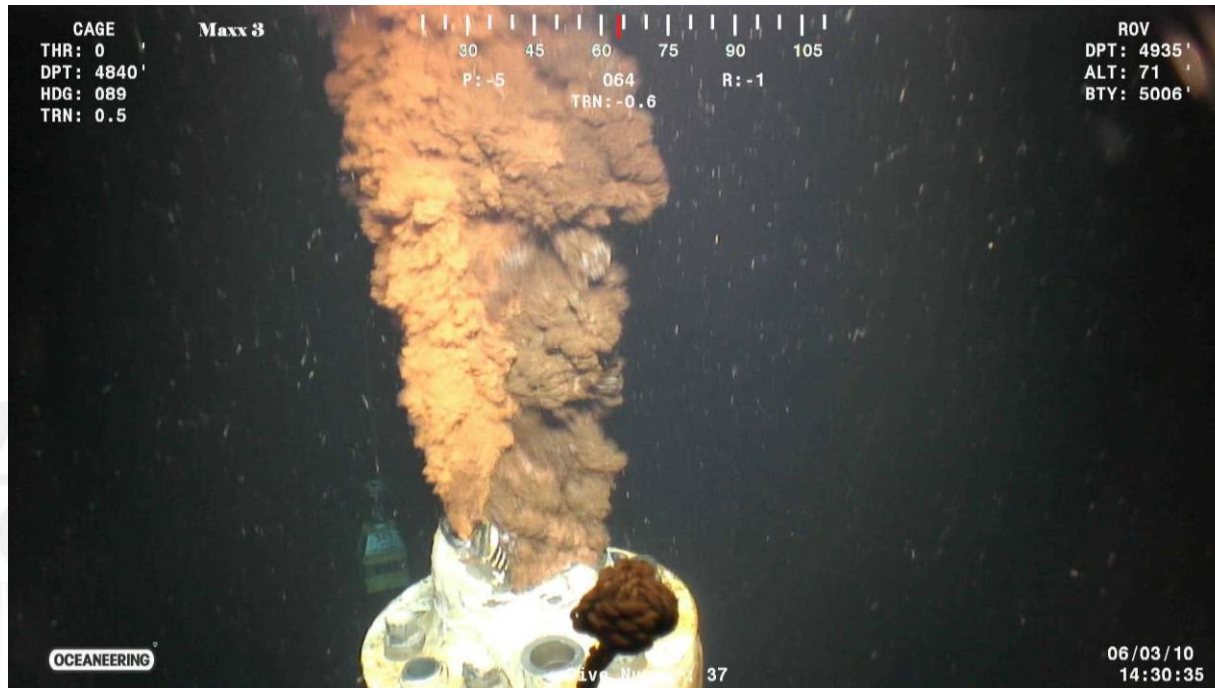
Blowout & Fire on the Deepwater Horizon Platform: April 20, 2010



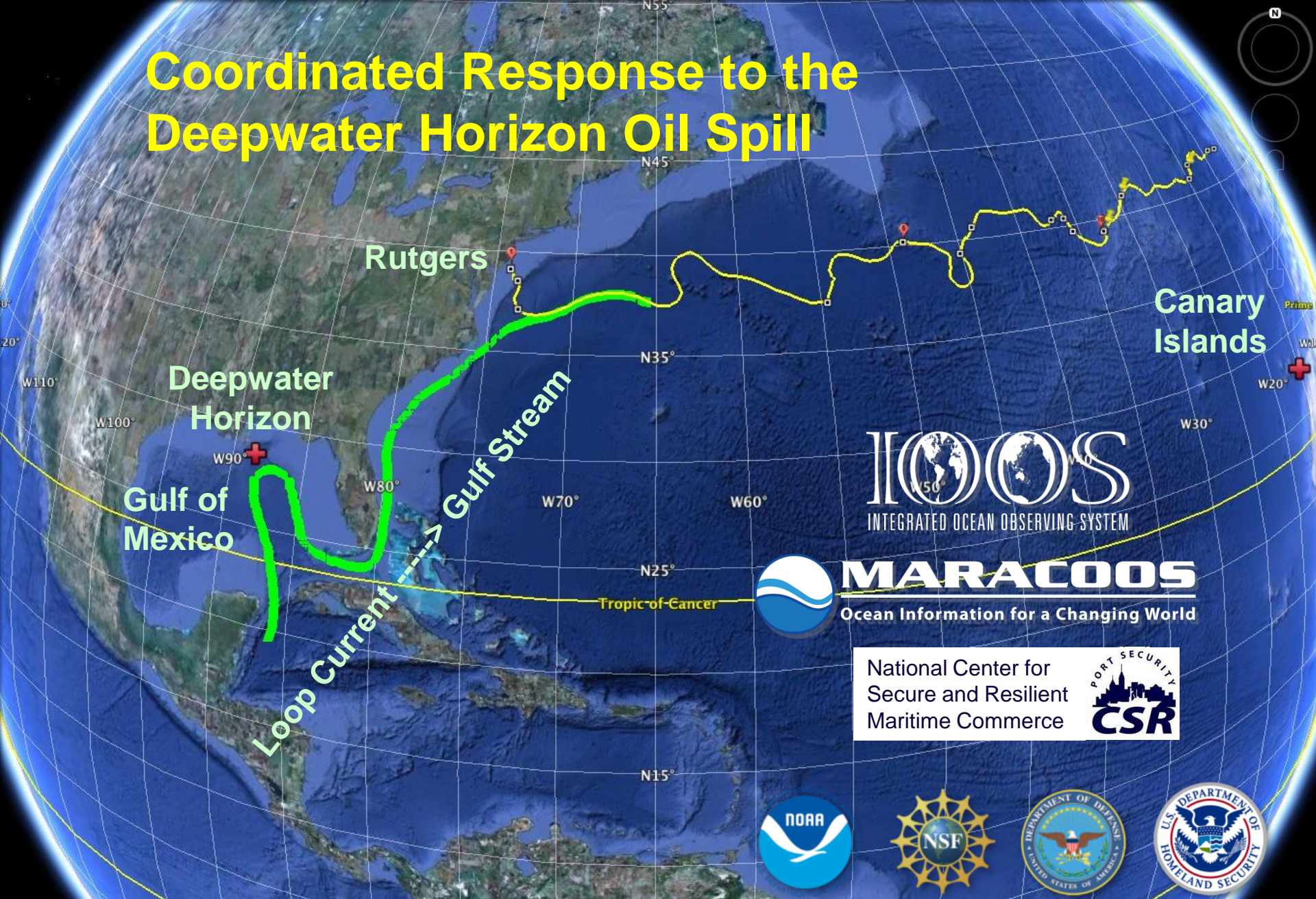
Deepwater Horizon Oil Spill

- Blowout on April 20, 2010.
- Well declared sealed on September 19, 2010.
- 4.9 M Barrels of Sweet Heavy Crude Released.
- 18.7 times the Exxon Valdez off Alaska.
- 7.4 times the Prestige off Galicia.

Worst Environmental Catastrophe in U.S. History



Coordinated Response to the Deepwater Horizon Oil Spill



Oil Transport Questions: Will the oil....

- Come ashore in Louisiana?
- Spread east to Texas or west to Mississippi & Alabama in the wind-driven coastal currents?
- Enter the Loop Current and be transported downstream?
- Hit the Florida Shelf and be driven shoreward by winds?
- Ride the Loop Current south and hit the Florida Keys?
- Be transported out of the Gulf of Mexico by the Gulf Stream and impact the East Coast?
- How much is below the surface?



Deepwater Horizon Glider Data Flow

- Individual glider operators provided, at minimum, Time, Lat & Lng time series.
- Available CTD data forwarded to NOAA National Data Buoy Center.
- Transmitted over the Global Telecommunication System for models.



Rutgers aggregation center
NOAA distribution center

Glider	Owner	Deployed	Tot Days	Tot Dist (km)
RU21	Rutgers	1	35	607
RU23	Rutgers	5	87	1582
UD 134	U of Delaware	3	51	1111.5
Bass	U of South Florida	3	31	552
Waldo	Mote Marine Lab	4	74	1476
Sam	U of South Florida	2	39	677
SG135	NAVOCEANO	1	86	1353
SG137	NAVOCEANO	1	86	970
SG515	iRobot/U of Washington	1	69	1500
Spray0040	SIO	1	106	3000
TOTALS:		18	317	6005.5

Trans-Atlantic Education

Social networking tools developed to enable collaboration between scientists and students in the U.S., Canada, Spain and Portugal

- PLOCAN
- Universidad de Las Palmas de Gran Canaria



TELETYPE WEB RESEARCH RUTGERS JOOS

Thanks to our Scarlet Knight Sponsors

The COOLroom is sponsored by

COOLroom is sponsored by: NOAA, NASA, NODP, IFPL, PSIG, MOORE

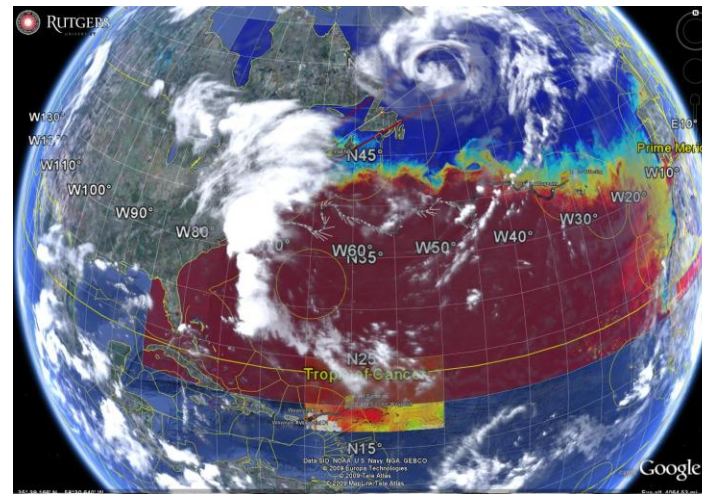
Image by Dan Crowell

- See more PHOTOS, read the latest PRESS, watch the introductory VIDEO, listen to the PODCASTS, view the LETTERS & AWARDS or download entire I-COOL Blog.
- Read the blog entry from the Executive Office of the President:
 - An (Underwater) Flight Across the Atlantic
 - OSTP Takes Custody of Robotic Underwater Overachiever
 - Dr. Miller's Official Reception remarks
- View the congratulatory video from U.S. Secretary of Commerce Gary Locke
- Visit the education page to learn about the U.S. and Spanish schools that participated in this historical flight

the Mission

On April 27, 2009, students and scientists from Rutgers University launched a small underwater robotic glider off the coast of New Jersey. The glider was christened The Scarlet Knight by Zdenka Willis, director of the U.S. Integrated Ocean Observing System. While previous explorers like Columbus and Lindergh used boats or planes to cross the Atlantic, The Scarlet Knight will attempt to be the first underwater robot to cross the Atlantic Ocean. With help from a number of international partners

The Scarlet Knight's Mission is Complete!



Google Earth
Interactive Interface

RUTGERS JERSEY ROOTS, GLOBAL REACH

I-COOL
International Coalition of Ocean Observing Laboratories

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Atlantic Crossing

RU27 Flight Across the Atlantic

16 A New Roadmap from Spain
Posted by Scott W. Atlantic Crossing

Ever since Scarlet entered Spanish waters, she has been fighting with a strong current to the south. Our usual geostrophic current maps derived from the satellite altimeter have not been of any help. The currents calculated from space are not agreeing with what Scarlet sees on the ground. Especially worrisome this morning was the strong current to the southwest running at 22 cm/sec. This is something we cannot fly against, so we have to turn sideways to it, and find more favorable currents. But which way to turn? Should we run perpendicular to this flow to the SE and try to get closer to shore? Or should we try to the NW? Guidance from our usual source, the geostrophic currents, can't be trusted.

I-COOL MISSION BLOGS

- Antarctic Blog
- Cook's Crossing
- Oceanography House
- Undergraduate Operations

HISTORIC BLOGS

- Across the Pond
- Atlantic Crossing
- Cook's Crossing
- Flight to Halifax
- Middle Atlantic Bight
- NORUS
- NURC Med Cruise 09
- Ocean Dynamic Project
- Spain Summer 2008

COOL KMZ FILES

- Active Deployments KMZ file
- Chironomid KMZ for Atlantic
- Gulf Stream SST KMZ 1km
- Iberian Peninsula Shipping Lanes
- RU2008 Glider Fleet Resources

COOL WEB LINKS

- Active Glider Navigation Page
- Active Gliders Transmits
- Atlantic Mission Public Site
- Gulf Stream Forecast

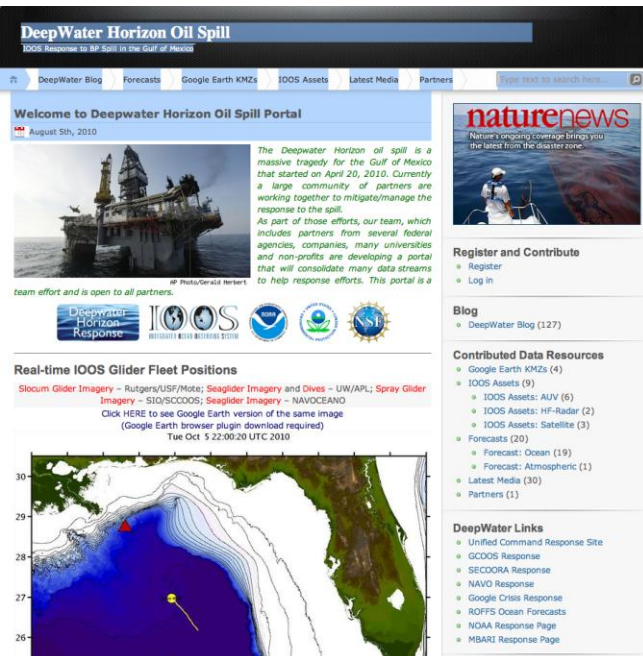
Briefing Blog

Web Portal

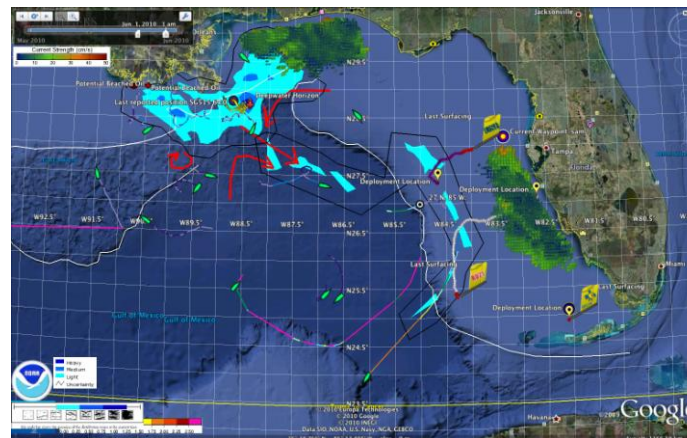
Deepwater Horizon Information Flow

Tools developed for education during the trans-Atlantic mission of RU27 adapted to coordinate response to the oil spill:

- 1) Collaborative web portal established as an aggregation center for information
- 2) Google Earth data/model interactive interface used for environmental analysis & glider path planning
- 3) Blog established to share analyses and provide comments – 127 briefs posted



Web Portal



Google Earth
Interactive Interface



Briefing Blog

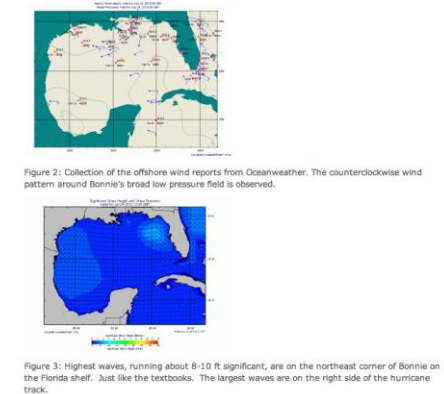
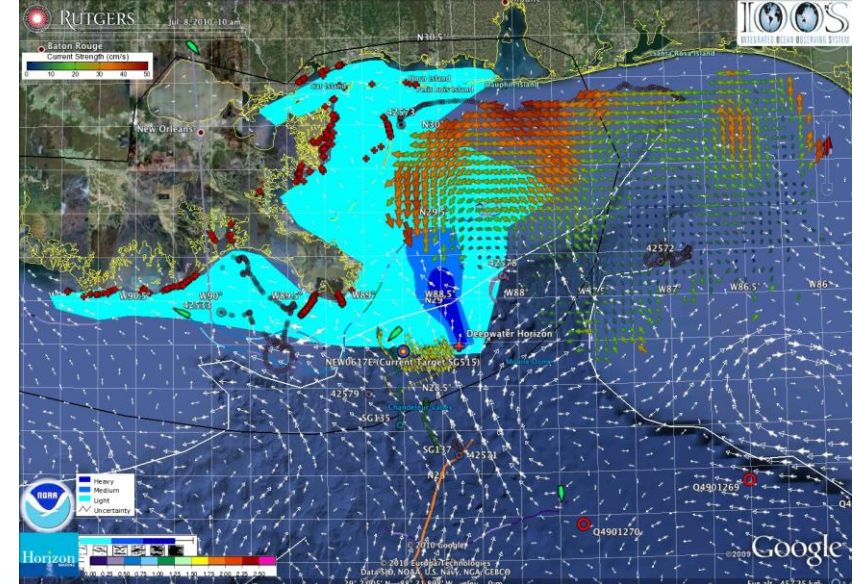
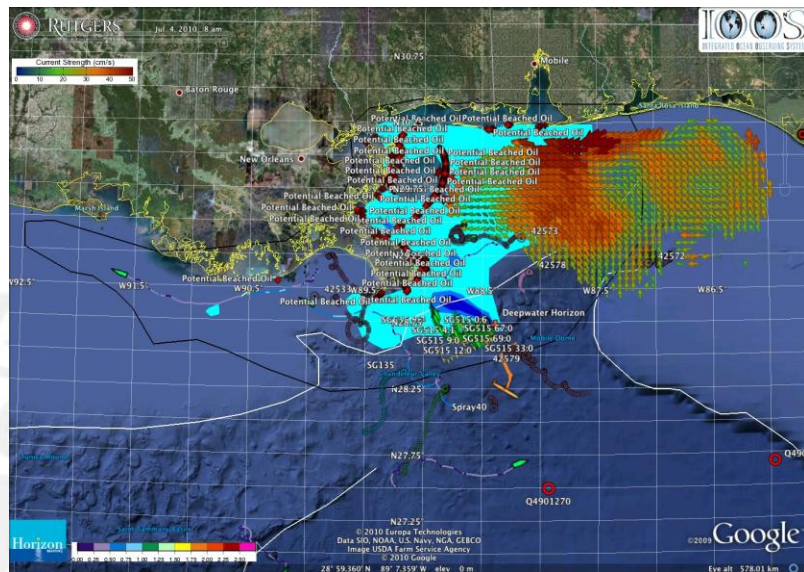
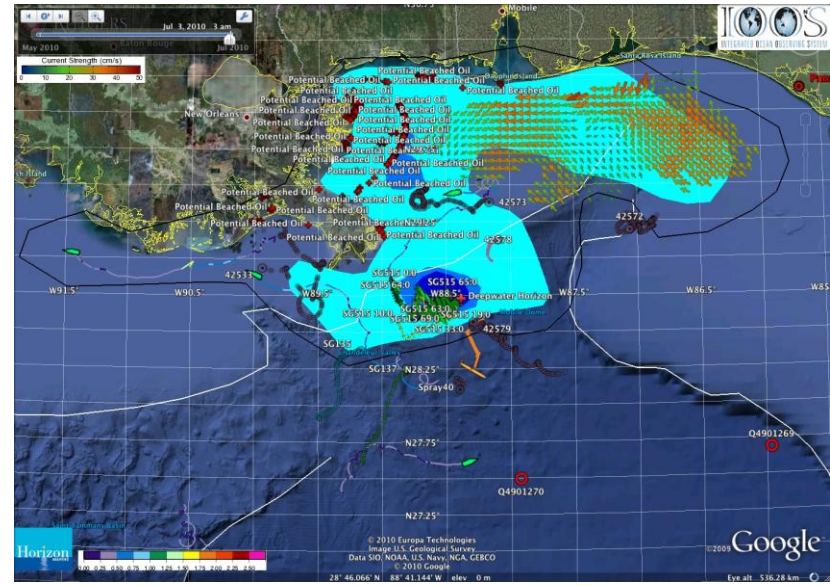
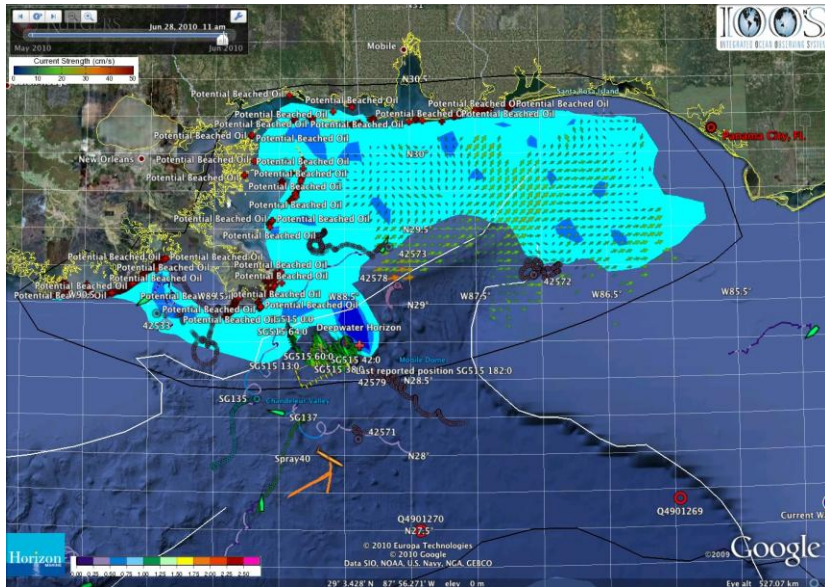


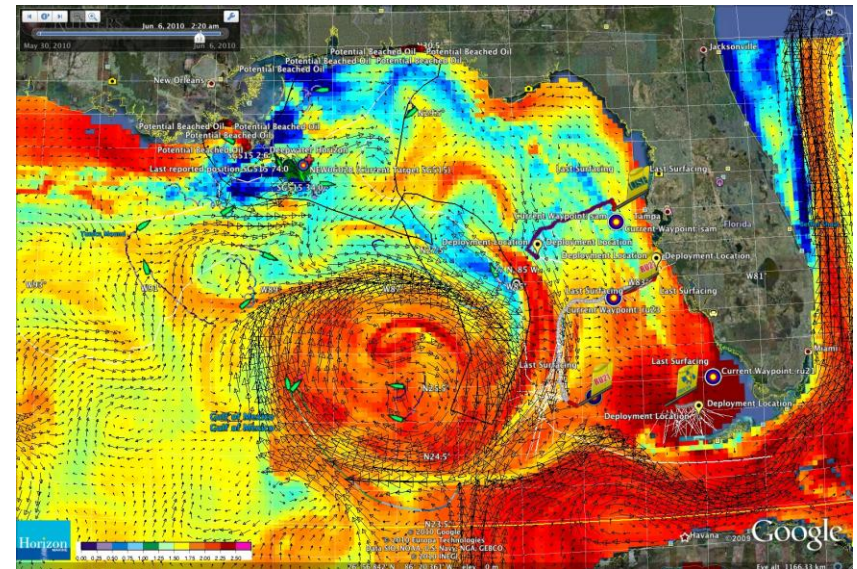
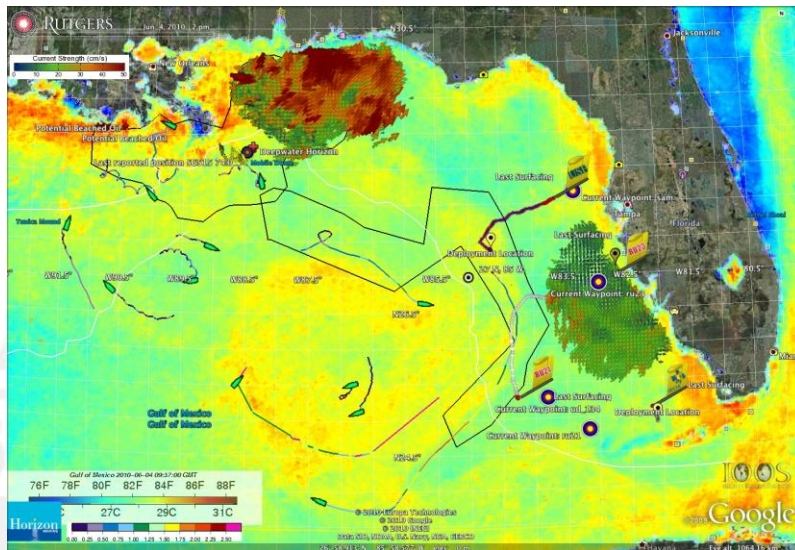
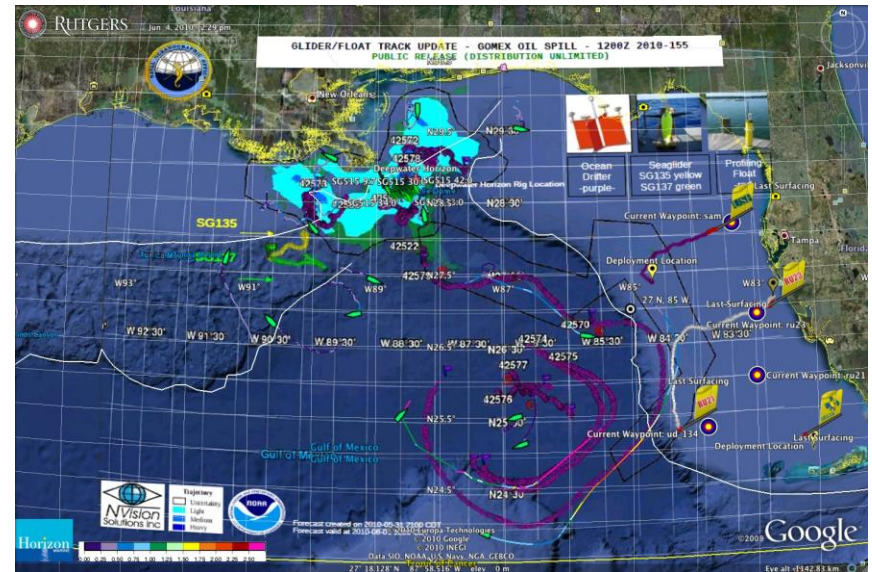
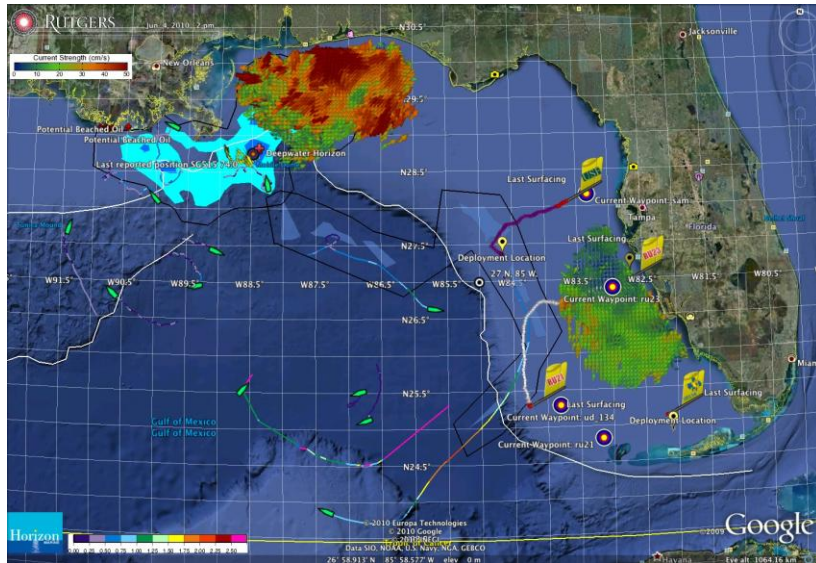
Figure 2: Collection of the offshore wind reports from Oceanweather. The counterclockwise wind pattern around Bonnie's broad low pressure field is observed.

Figure 3: Highest waves, running about 8-10 ft significant, are on the northeast corner of Bonnie on the Florida shelf. Just like the textbooks. The largest waves are on the right side of the hurricane track.

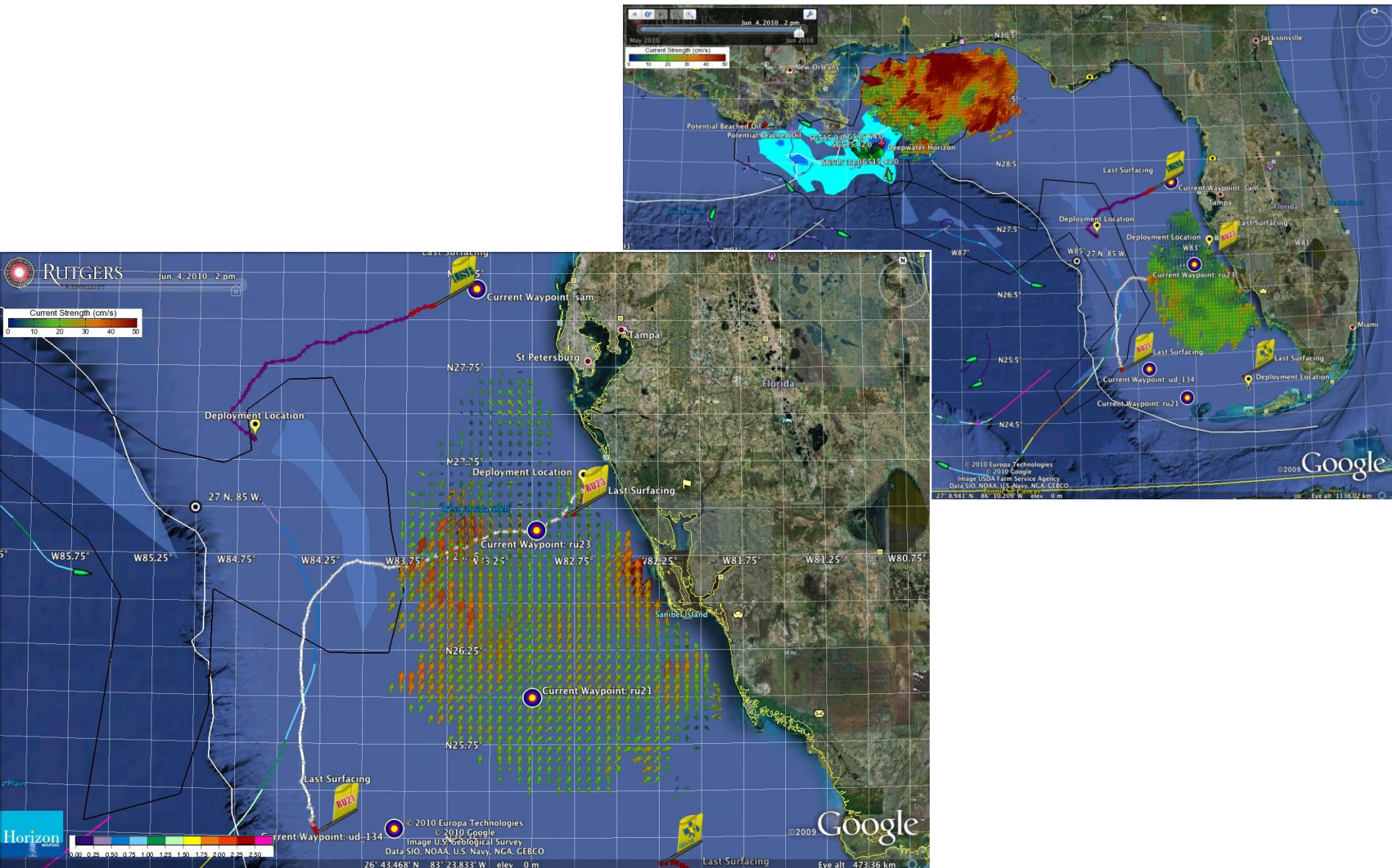
Deepwater Horizon Oil Spill Response: Near Field Environmental Analyses



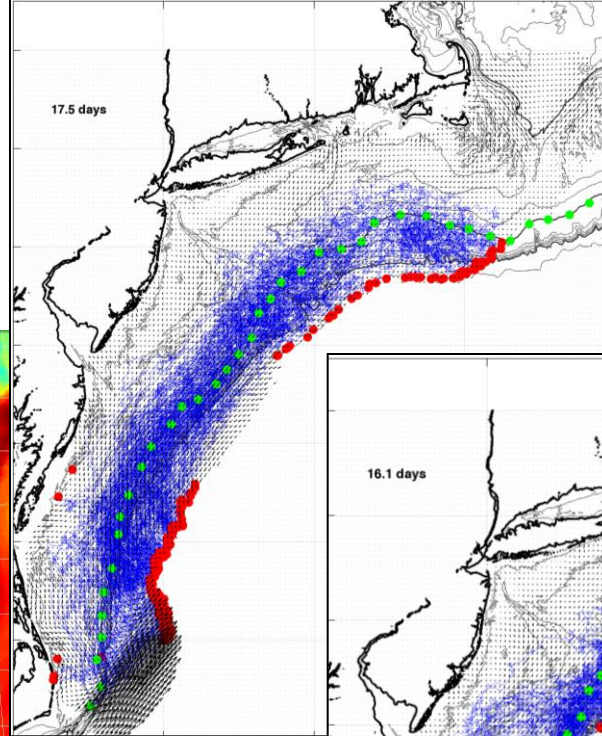
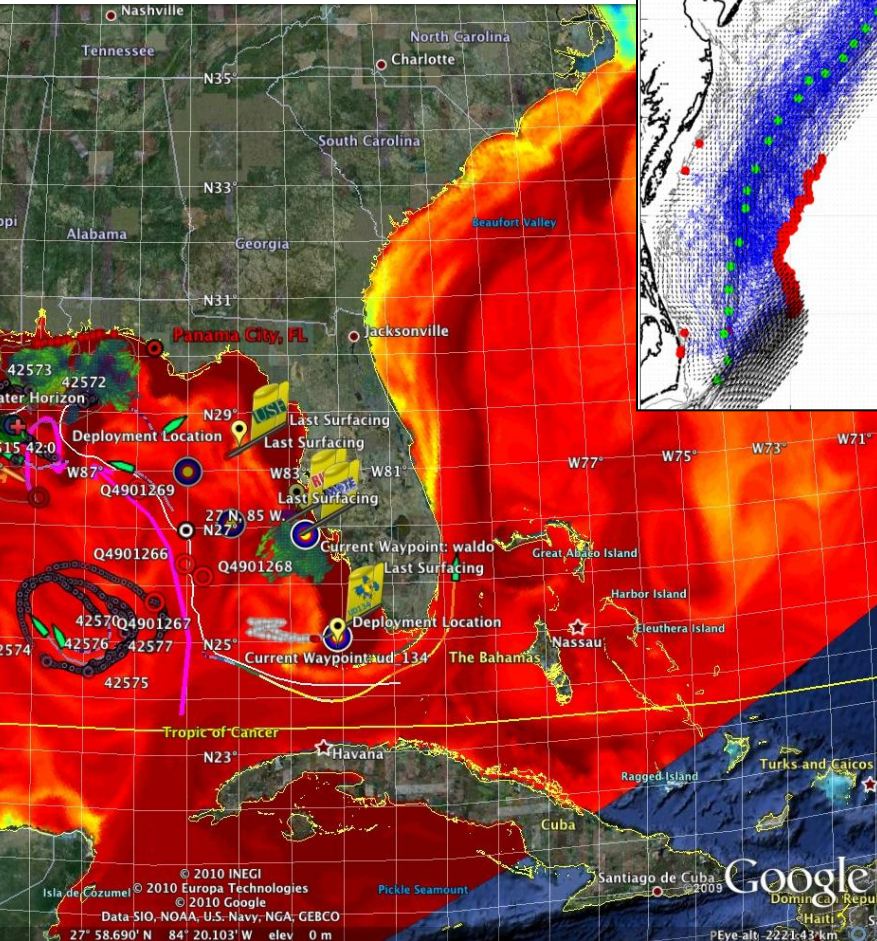
Deepwater Horizon Oil Spill Response: Far Field Environmental Analyses



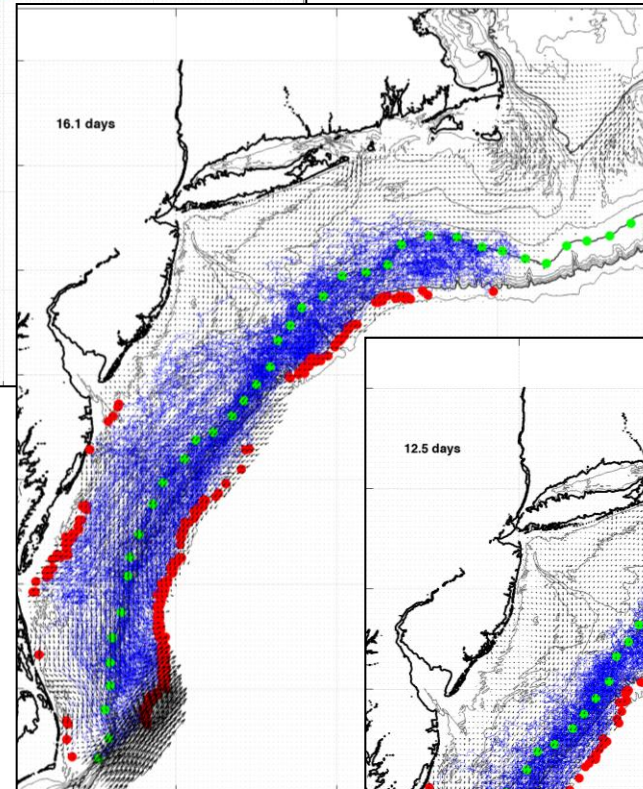
Deepwater Horizon Oil Spill Response: Approach to West Florida Shelf



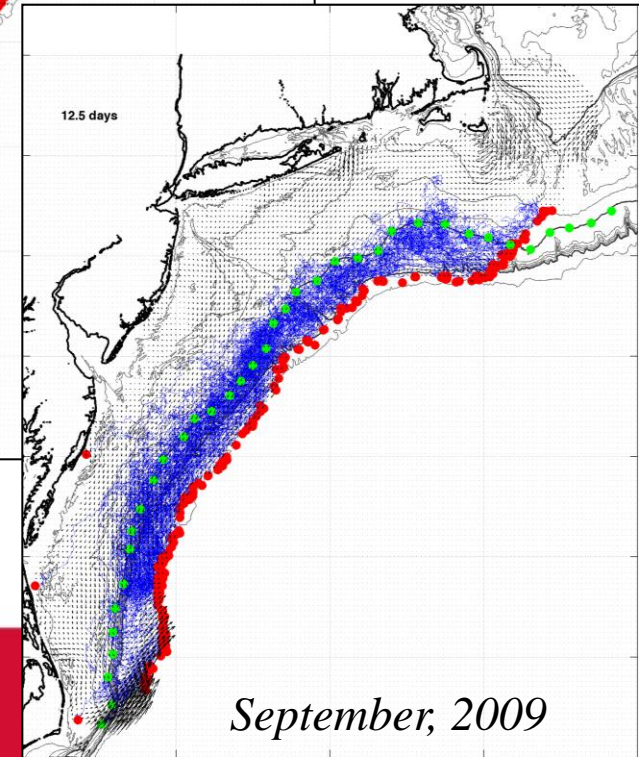
Deepwater Horizon Response: East Coast Impacts



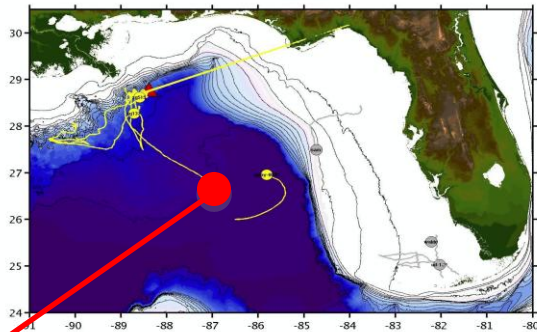
July, 2009



August, 2009



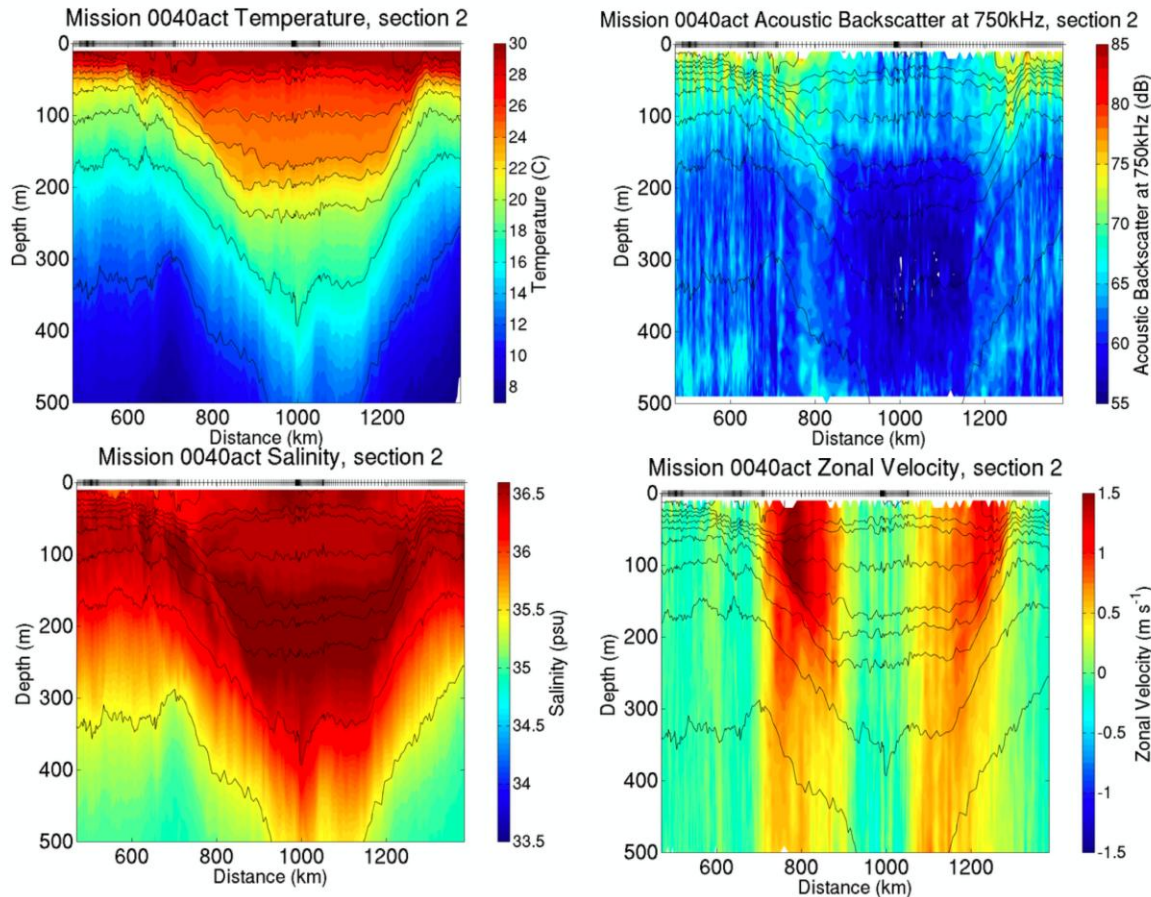
September, 2009

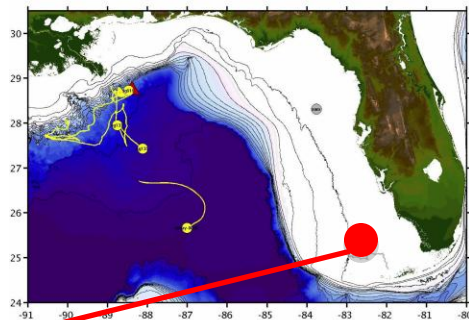


OFFSHORE VARIABILITY AND BEHAVIOR IN ANIMALS DURING DEEP WATER HORIZON

Scripps Spray story offshore

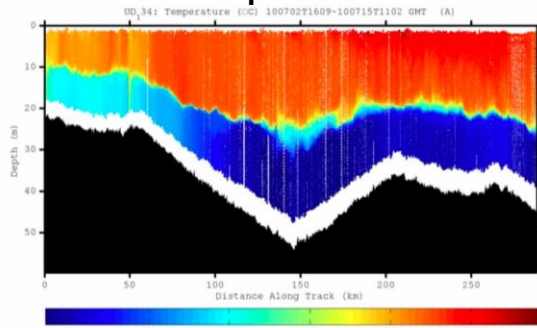
- cross offshore eddy
- acoustic backscatter showed diel migration of Organisms
- critters concentrated at the high zonal currents at the eddy edge



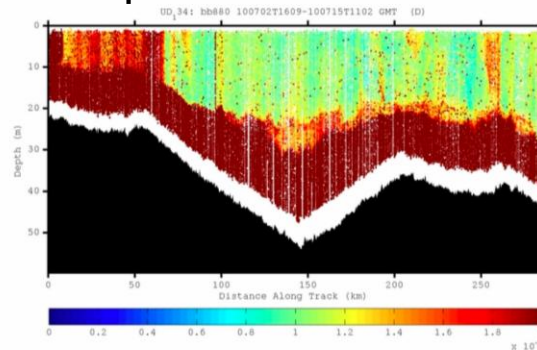


**Nearshore waters off Florida
show a great deal of subsurface optical
complexity not visualized with satellites**

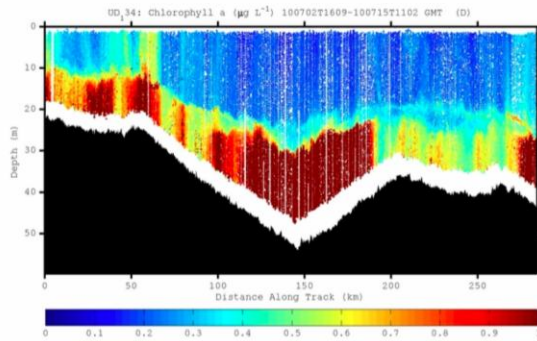
Temperature



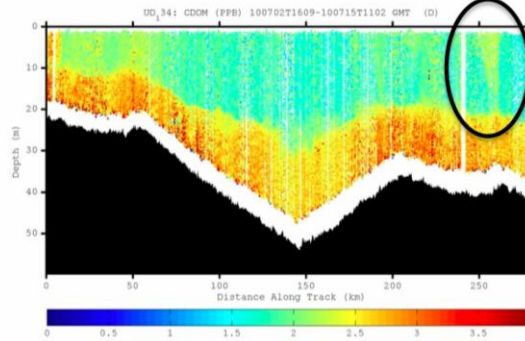
Optical Backscatter



Chlorophyll fluorescence

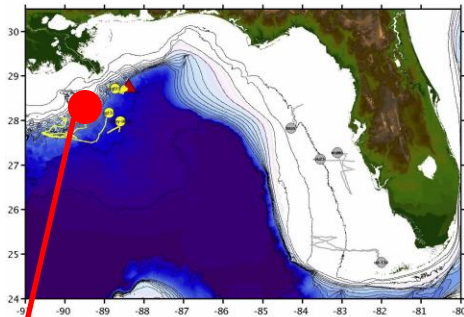


CDOM fluorescence



U. Delaware Webb story inshore

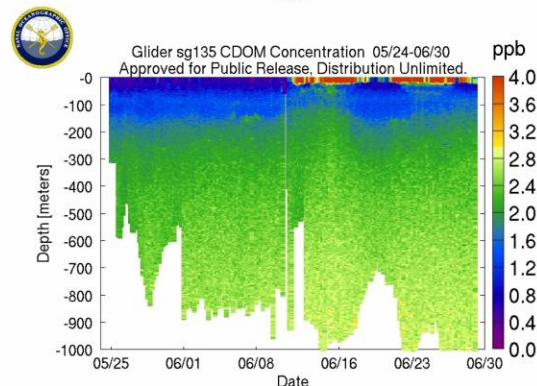
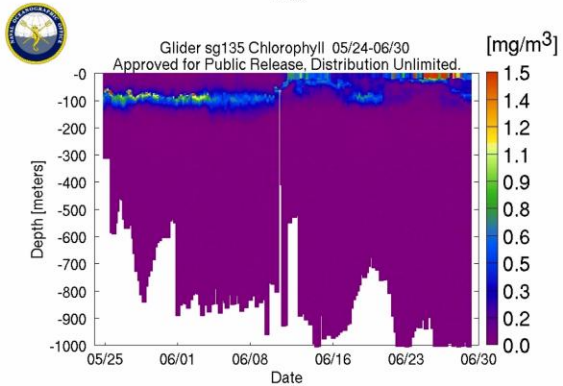
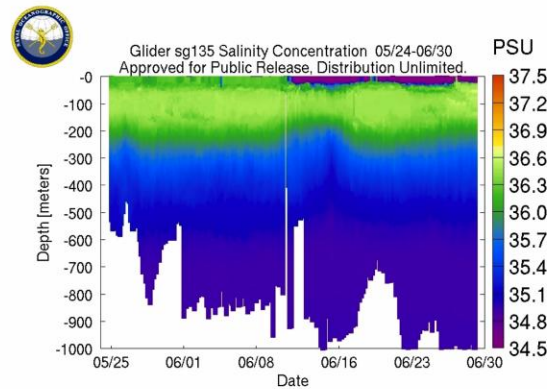
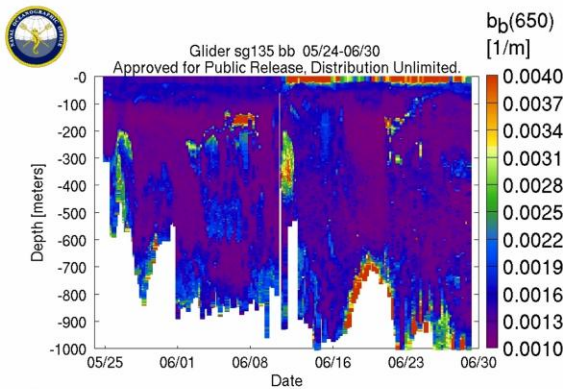
- Strongly stratified w/high sediment resuspension during storms
- CDOM offshore consistent with oil offshore
- ☹️ Phytoplankton more patchy than sediment

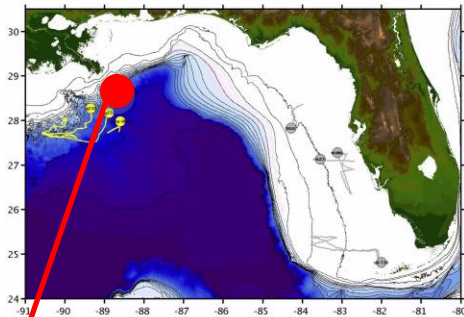


Waters offshore the west coast of Louisiana discoveries by NAVO seagliders

NAVO stories off Louisiana

- Presence of Mississippi visible in surface waters in CDOM
- Optical signals at depth are unexplained but real. We do not know what they are.
- Optical signals at depth are not phytoplankton.

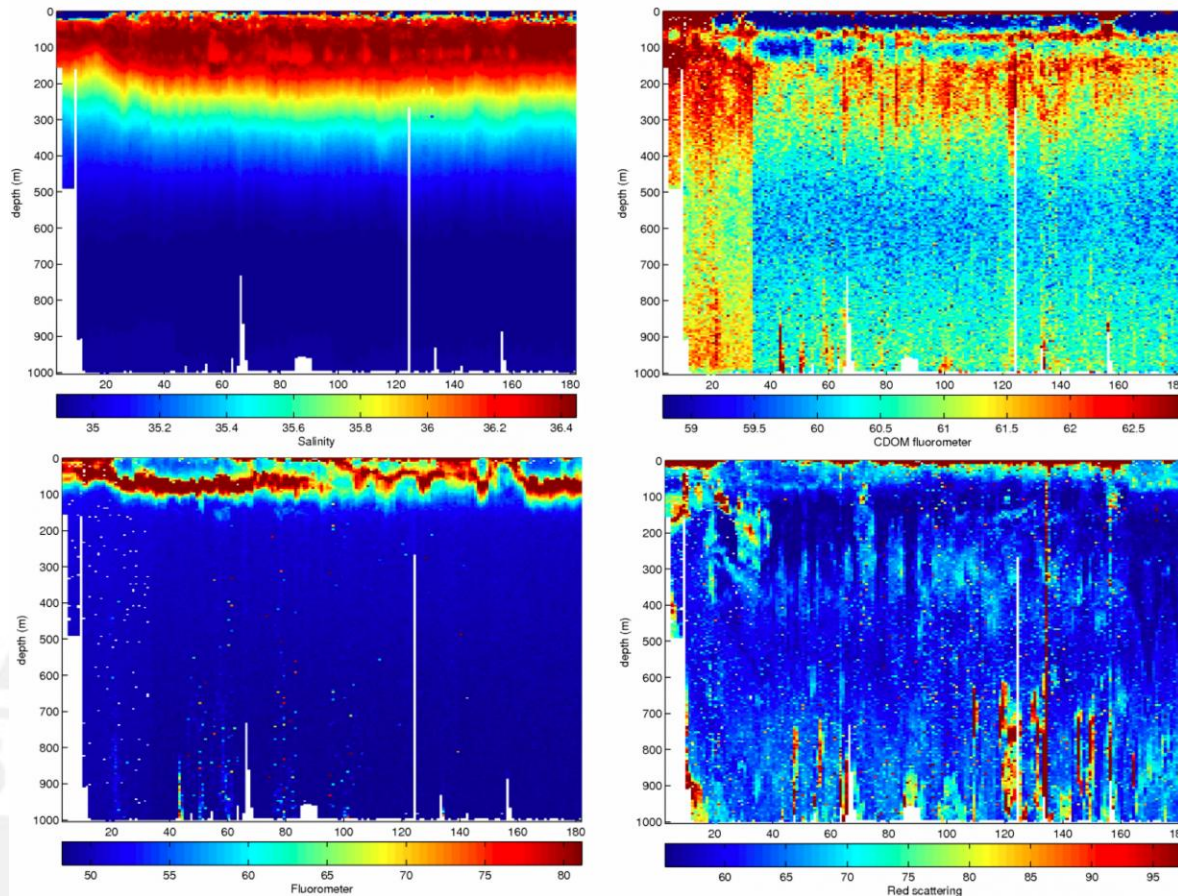




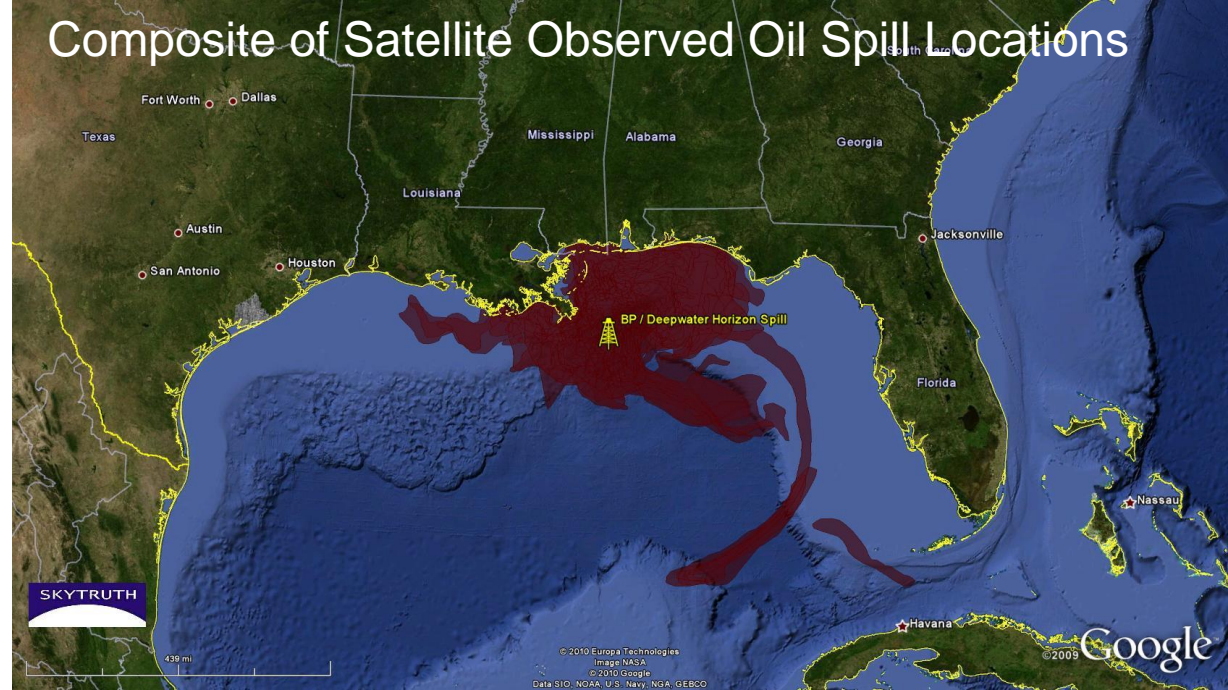
Waters offshore the oil spill region mapped by iRobot sea-gliders

iRobot stories off Deep Water

- CDOM at mid-depth consistent with oil plume
- Great deal of subsurface variability in CDOM not correlated with phytoplankton or particles
- Optical signals at depth are not phytoplankton



Feedback from the Deepwater Horizon Unified Command Center



“All - Greetings from Unified Area Command in New Orleans. I couldn't agree more - the IOOS community has acquitted itself very well during this entire incident. Not only has everyone provided valuable information - you have done it without getting in the way of the ongoing operations. It's been a pleasure to represent IOOS here and see all the great contributions from the larger IOOS community. “

- Sam Walker (IOOS representative to Deepwater Horizon Unified Command Center), June 18, 2010

“... AWESOME JOB - that call that we had last week was a very good thing. You are taking a huge burden off of the team here who is trying to simply capture the deluge of assets now being deployed. “

- Sam Walker (IOOS representative to Deepwater Horizon Unified Command Center), July 2, 2010

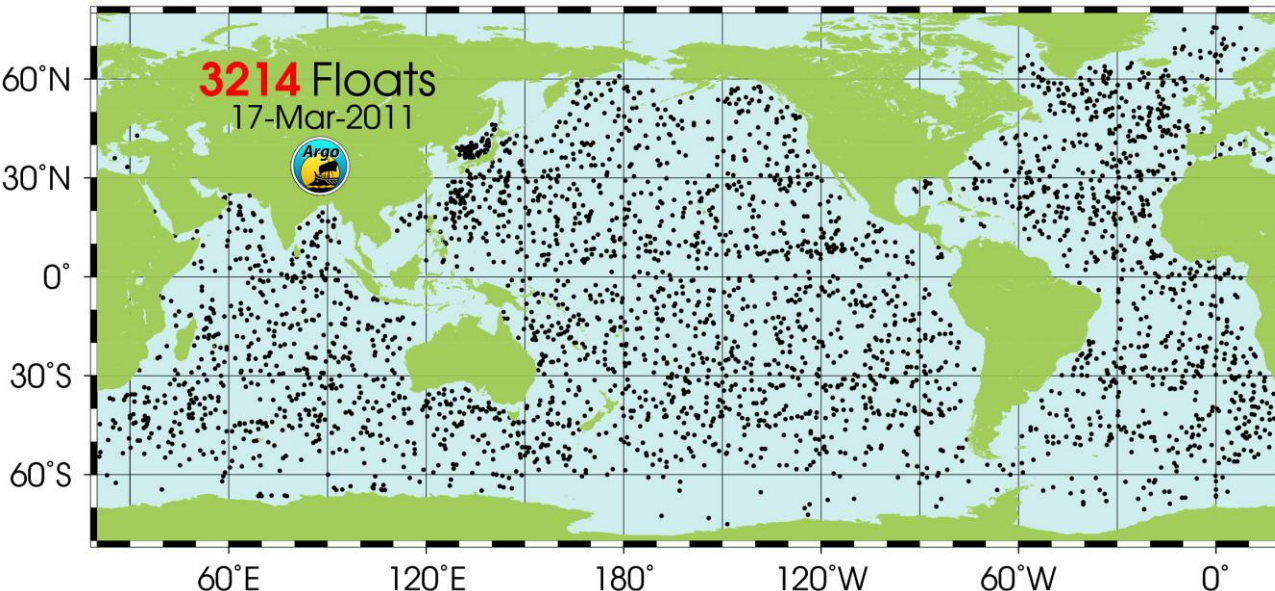
“...Thanks to everyone for all of your efforts to support the Response and the very professional and competent manner in which you have executed your efforts. IOOS has played a huge role in informing the modeling teams and the Unified Command through your extraordinary service. “

- Sam Walker (IOOS representative to Deepwater Horizon Unified Command Center), August 6, 2010

Response to the IOOS Success in the Gulf of Mexico

- 1) Funding for the U.S. National HF Radar network in the Presidents Budget.
- 2) Discussions for a U.S. National Glider Network invigorated.
- 3) Discussions to make both Global starting.

Google Maps display - U.S. National HF Radar Network



Global Glider Display

Minimum: Time, Lat, Lng

Options for data sharing:

- 1 – Send datasets to redundant aggregation centers.
- 2 – Serve up JavaScript Object Notation (JSON) for Google Maps.
- 3 – Post datasets on local webserver/fileserver with guest account access.

Conclusions

5th EGO Meeting and Glider School

2011 March 14th-18th
Gran Canaria /// SPAIN
ego2011.plocan.eu

Home News Travel Info About Canary Islands Multimedia Downloads Search Contact Us

EGO Meeting

- Overview
- Deadlines and Important Dates
- Call For Papers
- Meeting Programme
- Programme Schedule
- Organizational and Scientific Committee
- Registration
- Venue
- Accommodation
- Sponsors and exhibitors
- Gala Dinner
- Links
- EGO 2011 Flyer

Glider School

- Agenda
- Attendees

5th EGO Meeting and Glider School

"The chief source of ideas in Oceanography comes, I think, from new observations"
Henry Stommel.

The EGO -European/Everyone's Gliding Observatories- Meeting and Glider School is the major forum for scientist, engineers, technicians, students and industry to exchange knowledge into past and forthcoming experiences related to gliders technology and its multidisciplinary applications.





The two-day school section will allow potential new users to gain first-hand experience with glider operation, from the mechanical design, to programming and communications, deployment and recovery and data processing.

Parallel technical workshops to discuss problems, new ideas and solutions will also take place during the week, including a showroom with exhibitors from company providers.


The 5th EGO edition is looking forward to cordially welcome you in Gran Canaria, next March 2011!



Meeting Programme





Supported by



Latest News

Mar 2nd, 2011

EGO Website Update

The list of attendees to the Glider School has been published. Please check that you are included.

Feb 21th, 2011

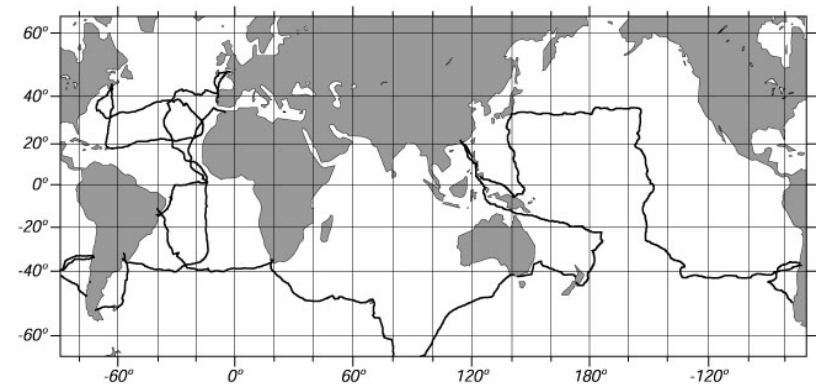
Feb 18th, 2011

Feb 02nd, 2011

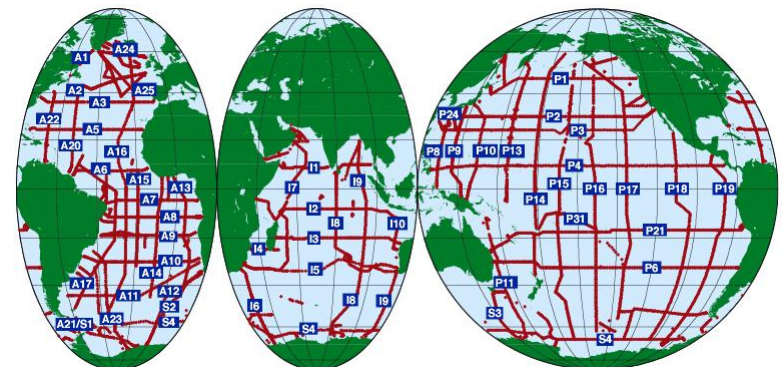
Feb 02nd, 2011

Transitions:

- 1) EGO to GGO
- 2) Technology to Science & Society
- 3) Research to Education



HMS Challenger Voyage



World Ocean Circulation Experiment