DEEPWATER HORIZON Response

NOAA's Role

A Presentation to the Subcommittee on Disaster Reduction
June 3, 2010

Margaret A. Davidson

Status as of June 2, 2010

- Tar balls washing up on Petit Bois Island at MS/AL state line
- Fisheries Disasters declared
  - May 24 for LA, MS, AL
  - June 2 for FL
- 31% of the Gulf of Mexico EEZ closed for fishing
  - Increase from 26% on May 31
- AL closed oyster beds in state waters from Dauphin Island to MS state line
- Florida oil landfall possible by Sunday
- Hurricane Season begins

NOAA Activities

- 97 NOAA staff deployed to the Gulf
- Providing scientific support to USCG and Unified Command
- Predict oil fates and effects
- Identifying resources at risk
- Recommend appropriate clean-up methods
- Oceanographic and atmospheric modeling and data support
- Marine & aviation incident weather forecasts
- Dr. Lubchenco speaking at LSU Science Summit today

Observations and Monitoring

- Subsurface oil plume monitoring
  - NOAA ships engaged
- Satellite imagery
  - Experimental imagery for spill trajectory forecasts
  - Data visualization
- Loop Current overflight surveys
- Coastal photography and mapping missions
- NOAA Seafood Inspection Program
- Marine mammals overflight surveys, beach strandings
- Sea turtle on-water surveys
- Shoreline Cleanup Assessment Teams

Gulf Oil Spill (GOSpill) According to NASA Earth Science

Presented to the

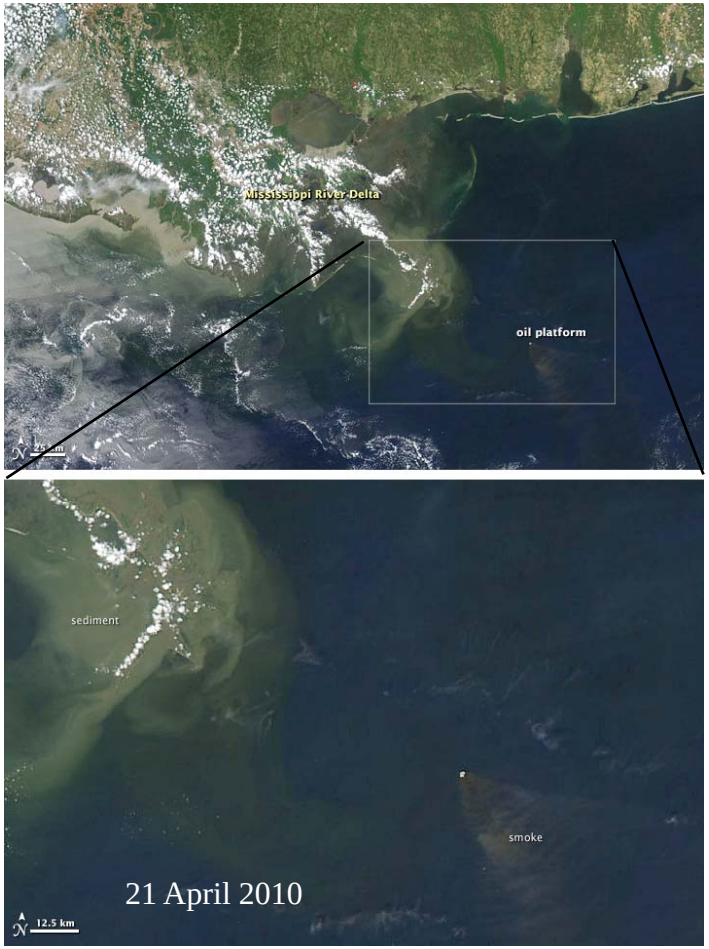
Subcommittee on Disaster Reduction

Michael Goodman

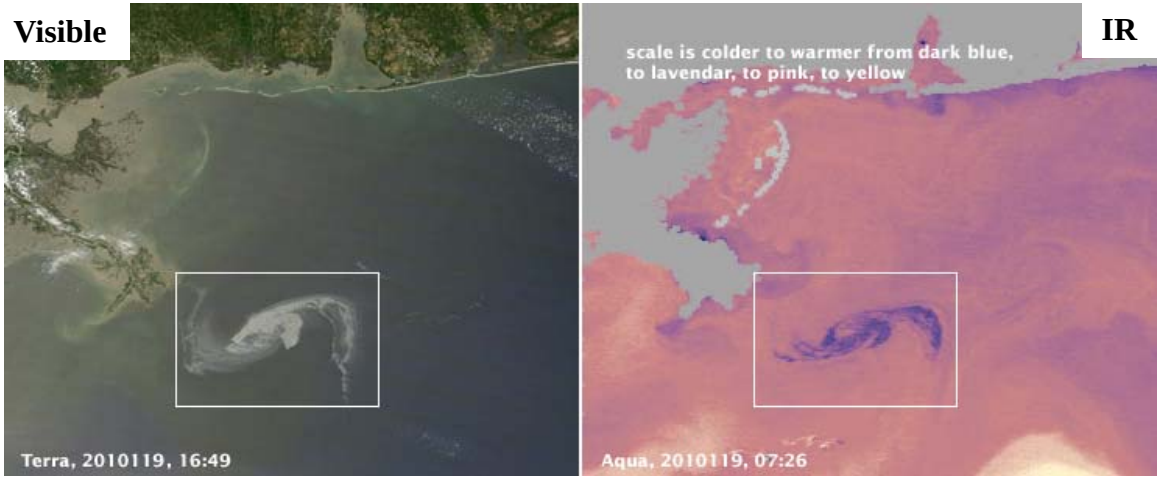
3 June 2010

MODIS Synoptic Coverage

MODIS view on 21 April 2010



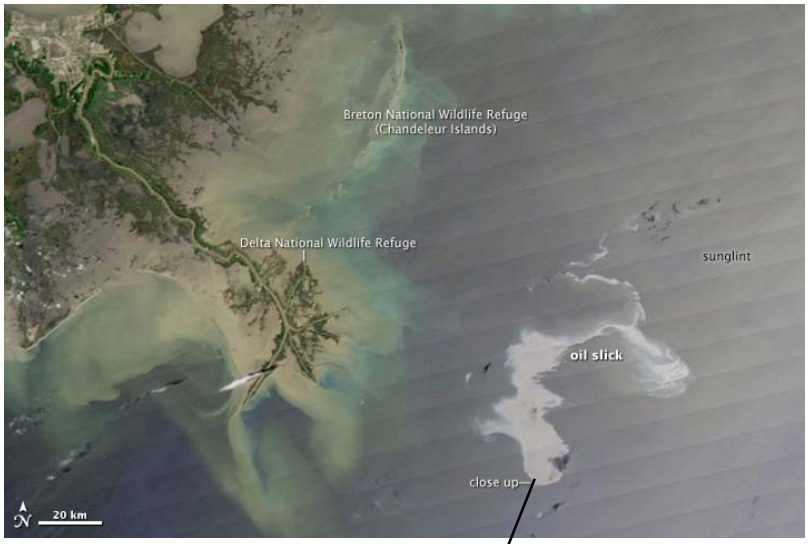
MODIS views on 29 April 2010



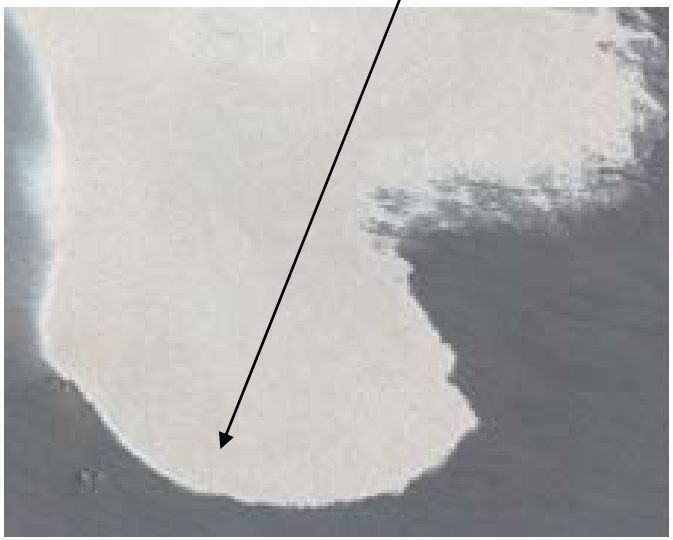
Satellite instruments: continually monitoring the extent of the spill:

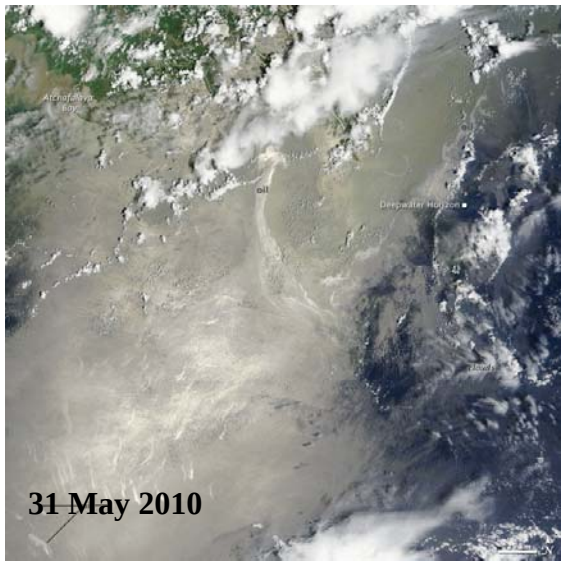
- Terra & Aqua / MODIS – visible and infrared daily synoptic
- Terra / MISR – Multiangle Imaging Spectroradiometer
- Terra / ASTER – visible, near IR and thermal IR high resolution
- EO-1 / Advanced Land Imager and Hyperion – highest resolution
- CALIPSO / CALIOP - lidar

Evolution of the Oil Slick

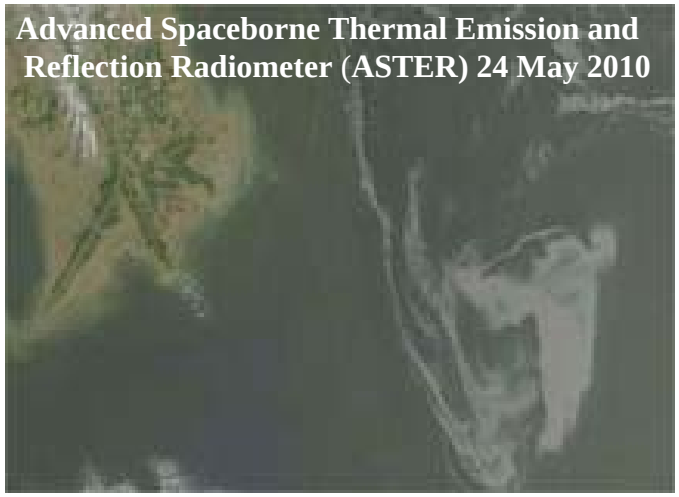


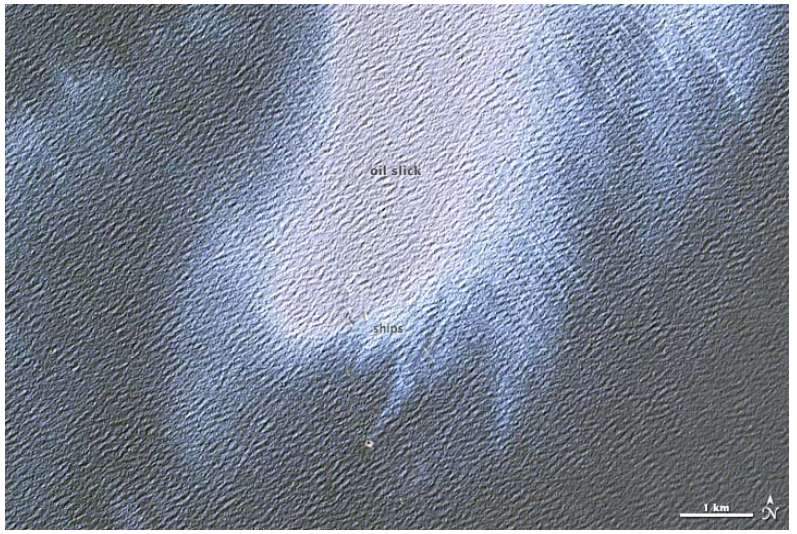
MODIS image at 250 km res compared to high resolution Advanced Land Imager w/ 37 km resolution on 1 May 2010

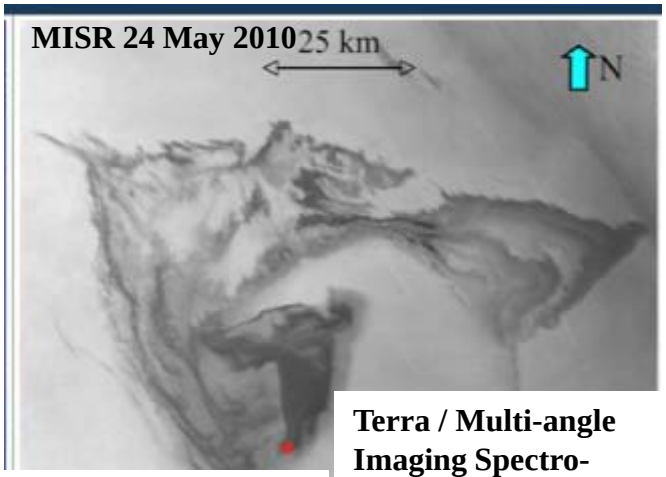




Other NASA Spaceborne Assets

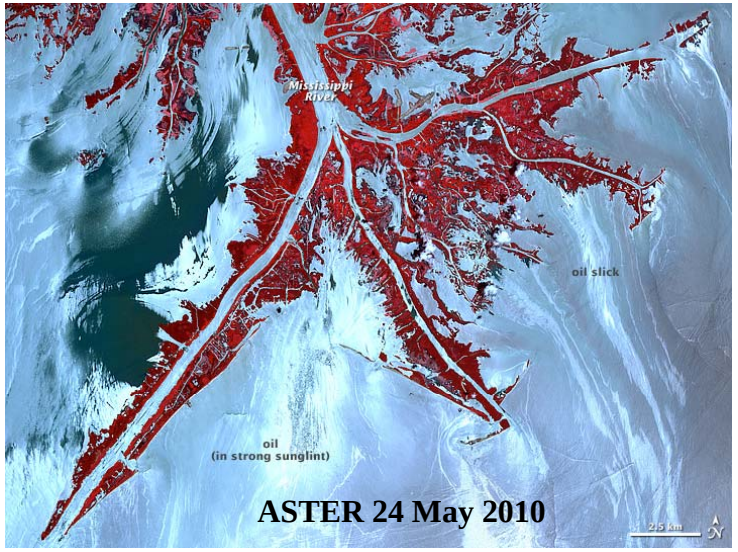






Visible/IR false color

Terra / Multi-angle Imaging Spectro-Radiomeger



ASTER 24 May 2010

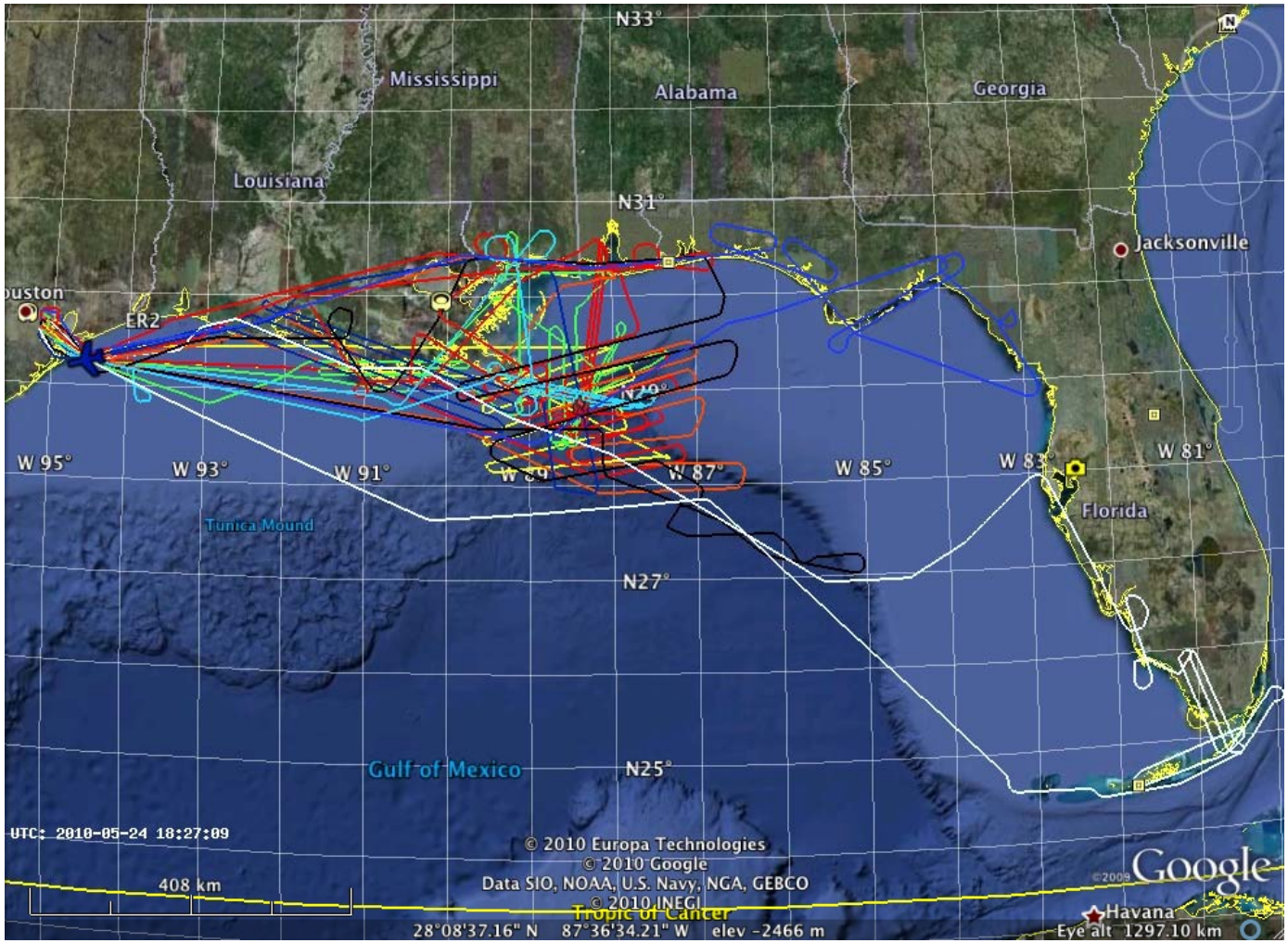
Airborne Observations of GOSpill

Airborne instruments are measuring the extent and volume of the spill:

- **ER-2 / AVIRIS & DCS**
  - **11 flights: 6–25 May 2010**
- **Data and products being provided to USGS distribution center for use by first responders to position equipment and for analysis of slick volumes**
- **Mapping of coastal zone**

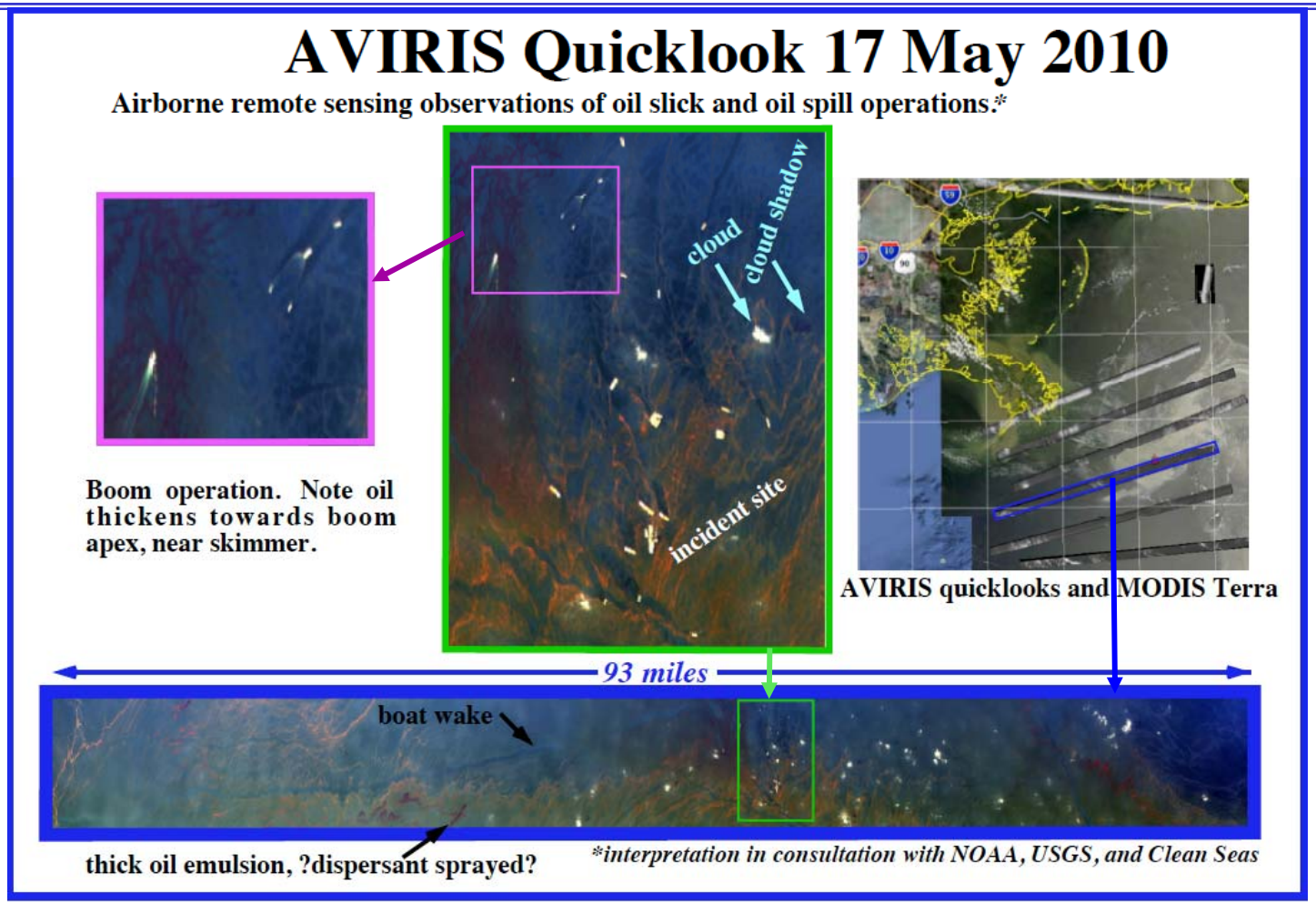
- **B-200 / HSRL**
- **2 flights: 10-11 May**
- **Validation of satellite lidar CALIOP**

- **G-III / UAVSAR**
- **22-24 June 2010 flights**
- **Health of coastal ecosystems**



ER-2 flight tracks (11) with the Airborne Visible Infrared Imaging Spectrometer and Cirrus Digital Camera System for the period 6 – 25 May 2010

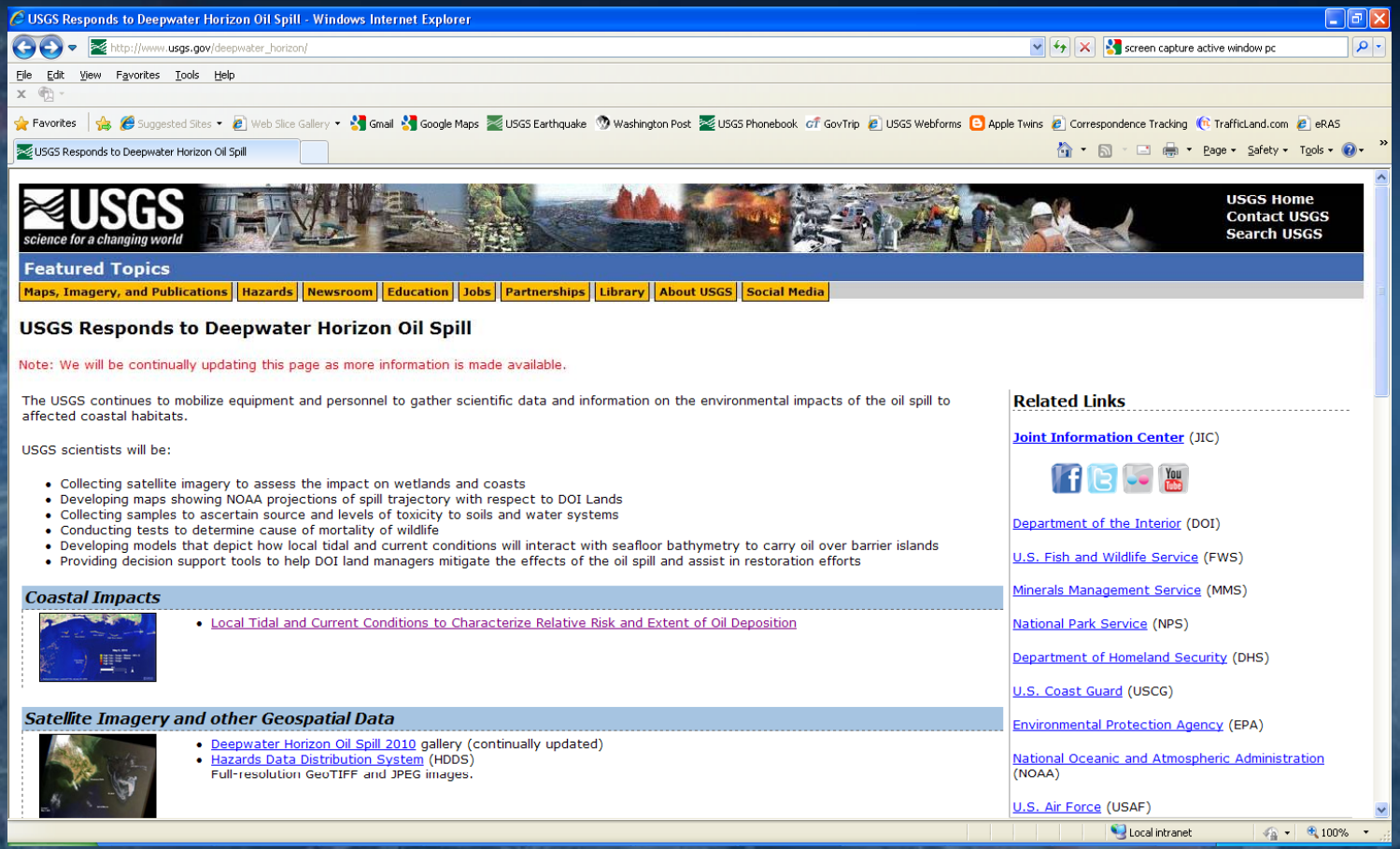
Closer Look at AVIRIS and MODIS in GOSpill



AVIRIS calibrated radiances provided to USGS-Denver Spectroscopy Lab for their application to derive Gulf of Mexico surface oil volume estimated between 130,000 and 270,000 barrels. Oil volumes to be provided to NOAA/NOS / Office of Response and Restoration as input into ocean oil trajectory models

USGS science response activities: Deepwater Horizon oil spill

SDR round-robin presentation – June 3, 2010



USGS

http://www.usgs.gov/deepwater_horizon

Estimating the flow rate

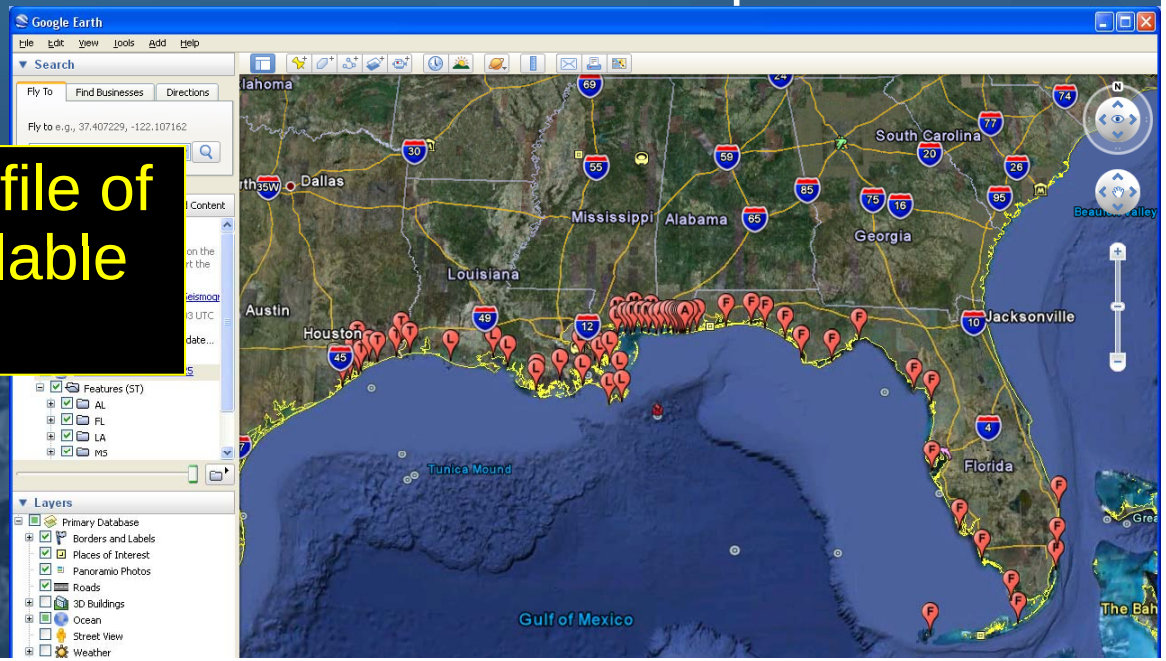
- National Incident Command Flow Rate Technical Group
  - Federal and university scientists and engineers chaired by USGS Director Marcia McNutt
  - Three separate methodologies: Mass balance, plume modeling, and riser insertion tube tool
  - 12,000 to 19,000 barrels per day

USGS

Baseline water/sediment/flora sampling

- USGS has completed water and sediment sampling on the coast and barrier islands in Texas, Grand Isle, LA, coastal Alabama, Mississippi and the Florida Panhandle to capture baseline conditions.
- Work with NPS in South Florida to coordinate collection of water-quality samples, conduct sea-grass bed surveys, and deploy semi-permeable membrane devices to sample lipids or fat-soluble semi-volatile compounds.

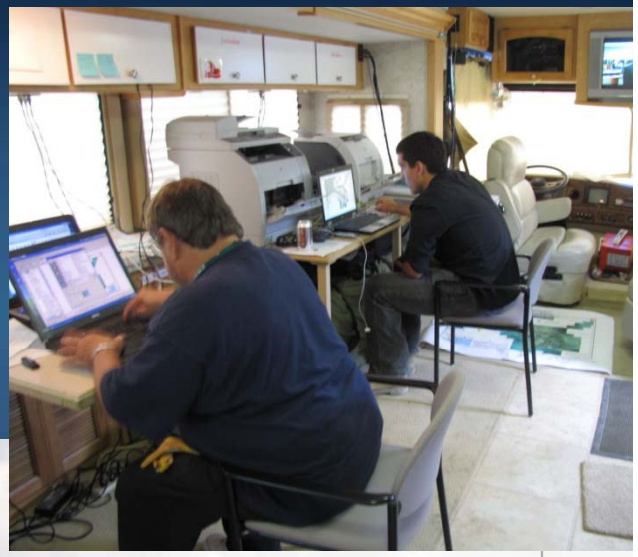
Google Earth KMZ file of sampling sites available on USGS website



USGS

Geospatial response

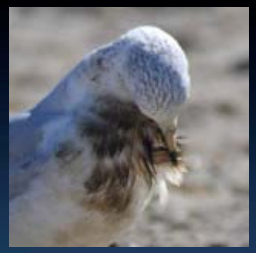
- The International Charter for Space and Major Disasters activated at request of NOAA and U.S. Coast Guard.
- Imagery and other geospatial products posted to USGS Hazards Data Distribution System (http://hdds.usgs.gov/hdds/) web portal.
- USGS EROS Data Center staff facilitate the interagency Remote Sensing Working Group, which coordinates requirements and products.
- Constructing detailed maps depicting habitats, topography, and bathymetry that cover NPS and FWS protected areas along Gulf Coast.
- Provide predictions of overwash for barrier islands within NPS and FWS protected areas for guidance on the locations of probable oil deposition on beaches.



USGS Science Response Vehicle at USFWS Ops Center, Houma LA

Biological response

- USGS is creating map products of sensitive species in the affected region, and compiling a list of all Threatened and Endangered Species and Species of Special Concern for the Gulf coast states and Atlantic states through the Carolinas.
- USGS National Wildlife Health Center providing USFWS and NOAA with gross external and internal examinations of carcasses and documentation of oiling via photographs for sea turtles, pelicans, and marine mammals.
- USGS is using low-level aerial surveys and oblique photography to determine damage to the mangroves from the 2010 winter freeze and under pre-oil conditions.



USGS

U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability

Deep Water Horizon Activities

U.S. Department of Energy

3 June, 2010

Expert Consultation with BP

- Secretary Chu leading effort with a small team of senior scientists
- Backed up with support from ~150 personnel
- Efforts Include:
  - Gamma Radiography of the Blow Out Preventer (BOP)
  - Hydrodynamic/Two Phase computer flow models
  - Assisting with Imaging and Sampling of the Seafloor
  - Independent Evaluation and Risk Assessment of options

Flow Characteristics/Flow Estimation Modeling

- Effort Led by National Energy Technology Lab
- Development of End to End Oil Flow Model
  - Reservoir to Well to BOP to Riser
  - Analyzing Flow Indicators to Tune Model
    - No actual pressure and flow data
    - Utilizing secondary data collection (acoustical/visual)
- Analysis of Methane Hydrate Formation and Impacts