

USGS Science in the Gulf: The Deepwater Horizon Oil Spill

Donna Myers | U.S. Geological Survey | July 15, 2010

The Nature of USGS Science

The Nation's natural science agency.

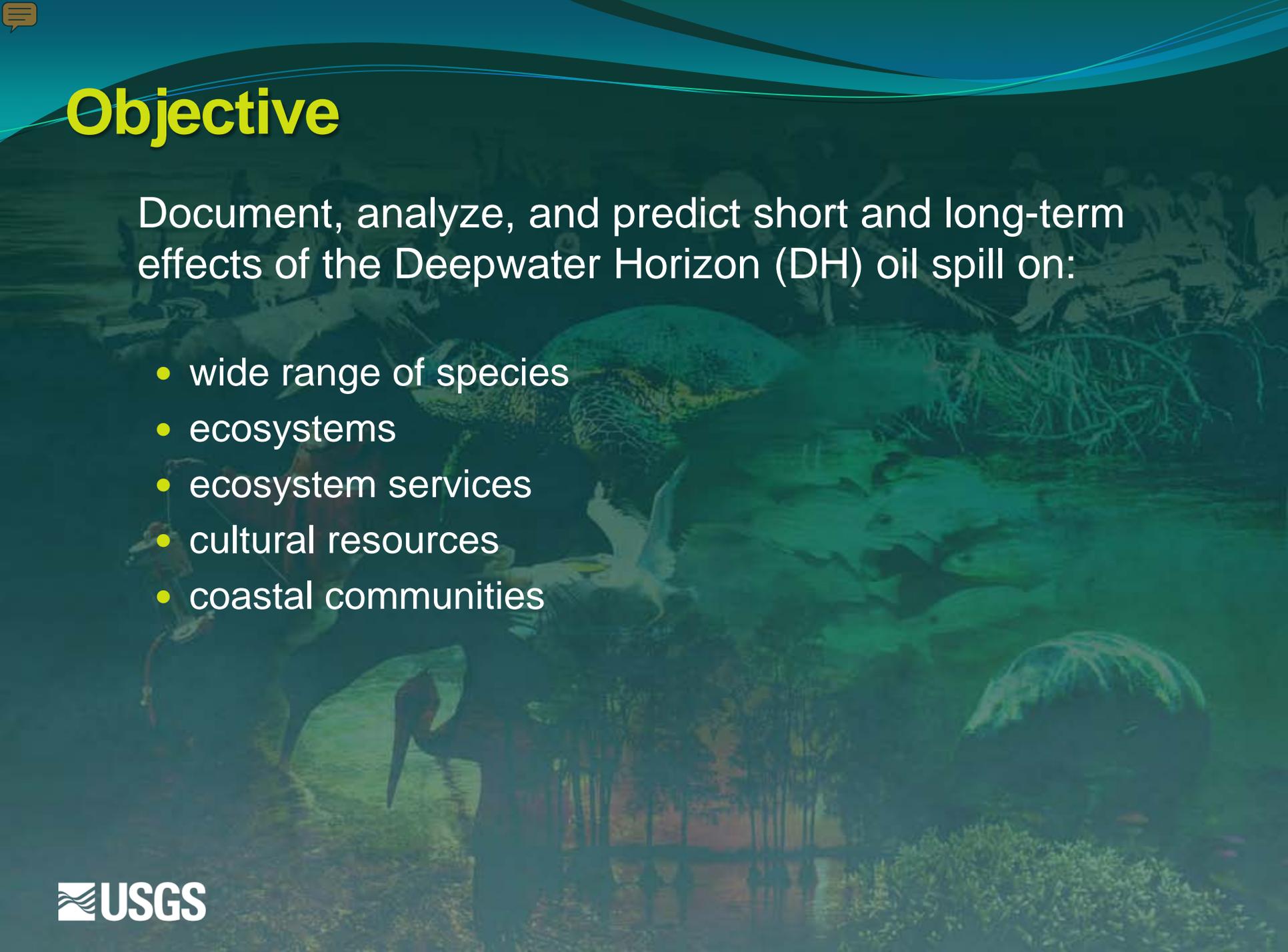
No management responsibilities.
Provides all DOI bureaus with
science information.

An independent research agency

Science resources leveraged in partnership
with more than 2,000 agencies:

- . State, local, tribal governments
- . Academic community
- . Other Federal allies
- . Non-governmental organizations
- . Private sector





Objective

Document, analyze, and predict short and long-term effects of the Deepwater Horizon (DH) oil spill on:

- wide range of species
- ecosystems
- ecosystem services
- cultural resources
- coastal communities



Science Themes

- Pre-impact assessment
- Volume, fate, and transport of oil contaminants
- Near- and long term impacts on wildlife and coastal ecosystems
- Impacts on Communities
- Tools to aid long-term recovery

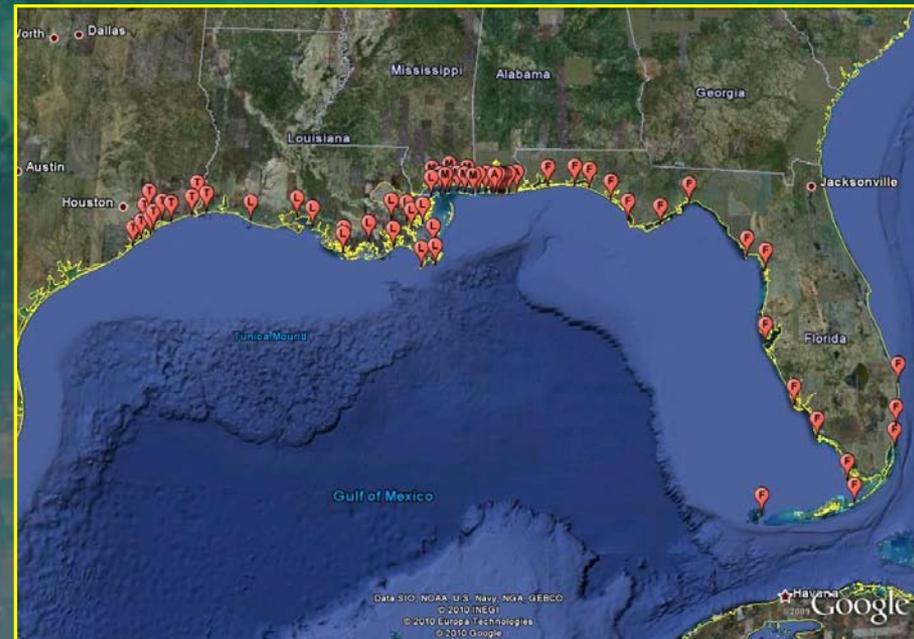


Lessons Learned from the 1989 Exxon Valdez Oil Spill

- Think long term regarding impacts and recovery
(1-2 decades)
- Consider both offshore marine and coastal ecosystems
and multiple levels of food chain
- Pre-spill data critical for assessing injury to resources and recovery
- Natural variation in marine and coastal ecosystems will confound
understanding of recovery

Pre-Impact Assessment

- Water, sediment and benthic samples at ~70 locations
- SAV and mangrove photo surveys and ground truthing
- Remote sensing and production of maps and GIS layers showing historical and current locations of trust resources, coastal ecosystems, and shoreline conditions
- Fish collection in So. Florida
- AVIRIS
- Inundation maps





Volume of Oil

Flow Rate Technical Group (FRTG)

- Federal scientists, independent experts, university representatives
- Three independent teams developing best methods to assess spill
- BP not involved, except to provide some raw data
- Overlap in preliminary team assessments
- Assessments to be further refined

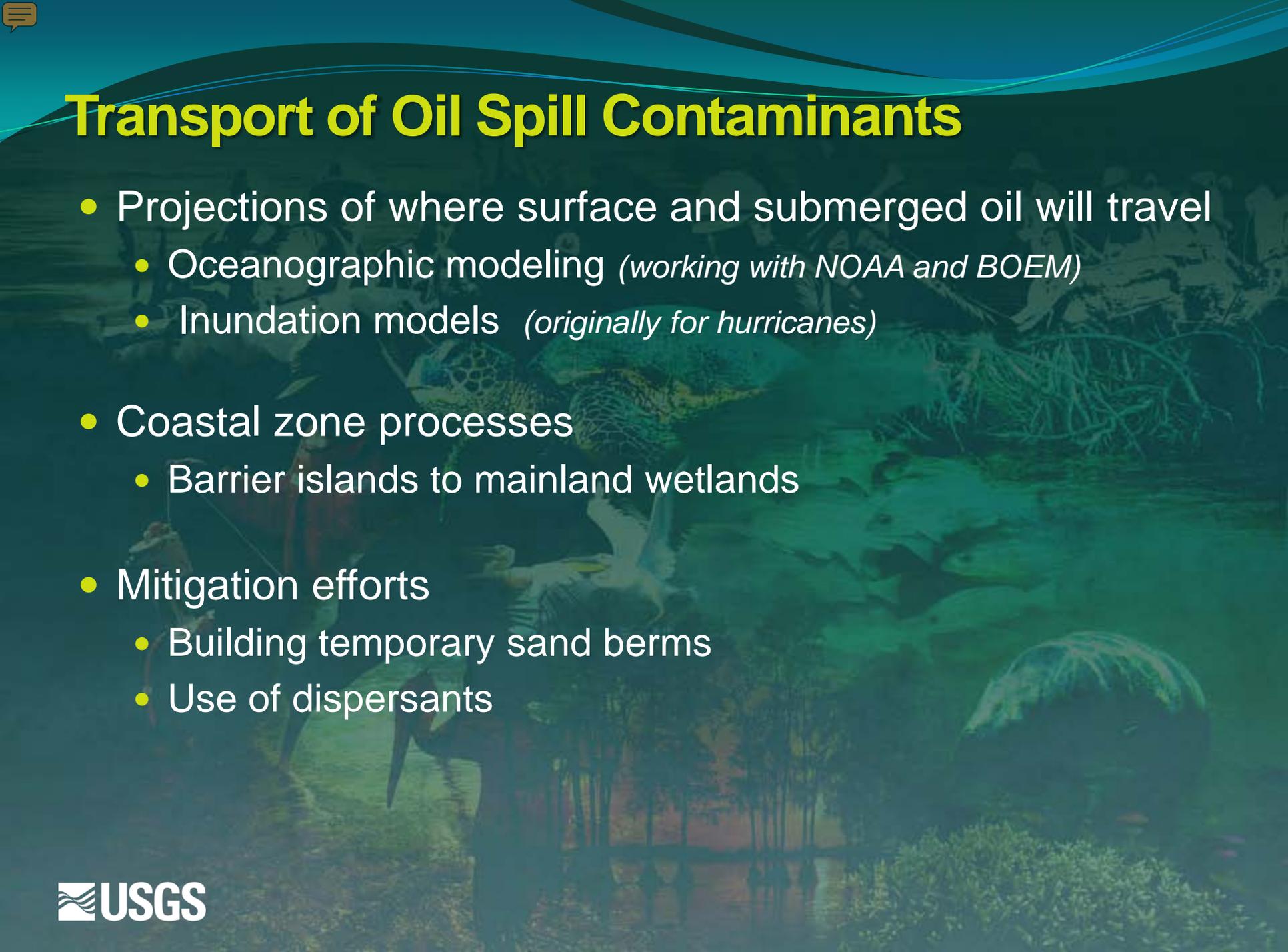
Flow Rate Technical Group Mass Balance Team



Fate of Oil Spill Contaminants

- Characterize source oil and dispersant
- Organic component analysis for samples taken across matrices, locations and time frames
- Describe temporal attenuation and biodegradation of the oil
- Visual and meteorological records for surface conditions and the surface slick
- Land fall data - dates, locations, estimated volumes/mass, characteristics of the oil/tar



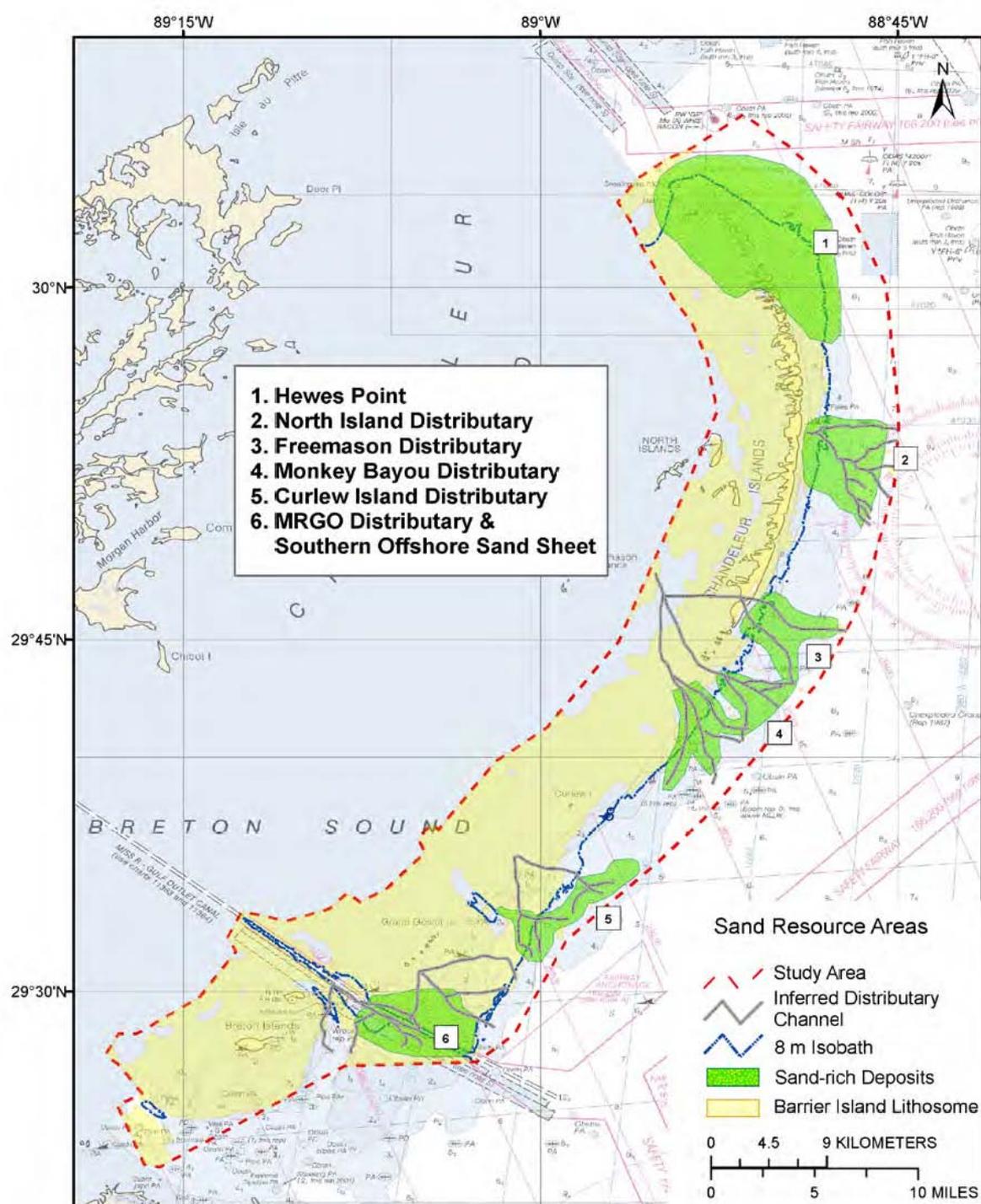


Transport of Oil Spill Contaminants

- Projections of where surface and submerged oil will travel
 - Oceanographic modeling (*working with NOAA and BOEM*)
 - Inundation models (*originally for hurricanes*)
- Coastal zone processes
 - Barrier islands to mainland wetlands
- Mitigation efforts
 - Building temporary sand berms
 - Use of dispersants

USGS Open-File Report
2010–1108
June 2, 2010

*Effects of Building a Sand
Barrier Berm to Mitigate the
Effects of the Deepwater
Horizon Oil Spill on
Louisiana Marshes*





Responding to Adversity

Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been.

President Obama

At the National Academy of Sciences

April 27, 2009