SCIENCE IN SUPPORT OF DEEPWATER HORIZON OIL SPILL RESPONSE

http://response.restoration.noaa.gov

http://www.aoml.noaa.gov/phod/dhos/index.php

Introduction

Authorities for NOAA’s role:

- Scientific support to U.S. Coast Guard (USCG) under the Oil Pollution Act of 1990 (OPA-90): NOAA provides scientific support to USCG in their role as Federal On-Scene Coordinator (FOSC) for Oil Spill Response Actions
- Seafood Safety support under Magnuson-Stevens Fishery Conservation and Management Act (MSRA) and in conjunction with FDA’s regulatory responsibilities.
- Living Marine Resource (LMR) protection under MSRA, Marine Mammal Protection Act (MMPA), and Endangered Species Act (ESA) as well as other statutes such as the Fish and Wildlife Coordination Act, Marine Health and Stranding Response Act
- Natural Resource Damage Assessment under OPA-90: NOAA, as a Trustee for natural resources, works with other federal and state trustees to assess the injuries to natural resources from the oil spill and the oil spill response actions.
- Oceans and human health effects, including effects on ecosystem health, marine organism health, and human health under Oceans and Human Health Act, Harmful Algal Blooms and Hypoxia Research and Control Act.

Immediate Actions (event to 2 months)

NOAA is providing scientific support to the Response Incident Command, through the USCG FOSC. This includes daily trajectories for fate and transport of surface oil, higher resolution of the interaction between surface oil and the Loop Current, daily predictions of shoreline oil impacts, on-scene assessment of shoreline oiling through overflights and Shoreline Cleanup and Assessment Technology Technique (SCAT) models describing likely fate and transport of oil dispersed at the well head, daily observations and evaluations of marine mammal and turtles, estimates of oil flow rates, organization of scientific data, and ongoing science briefs to local, state, and national groups. NOAA currently staffs command posts in Robert, LA; Houma, LA; Venice, LA; Mobile, AL; St. Petersburg, FL; Miami, FL; and Key West, FL. NOAA also has a scientific support group in Seattle, WA and provides staff for the National Incident Command in Washington, DC. As of the end of May, NOAA has four aircraft, two NOAA ships, and is supporting/has supported five contract ships involved in this incident. Additionally,
through partnerships, NOAA is supporting several additional cruises and is working closely with non-federal as well as federal partners in coordinating information derived from a fleet of AUVs and underwater gliders operating throughout the northeastern Gulf of Mexico.

NOAA is closing federal waters to fishing based on oil trajectories, initiating training for seafood safety assessment for oil and dispersant contamination - via both organoleptic and chemical analyses - and collecting untainted seafood for these tests and trainings. As a Trustee for natural resources, NOAA is working with USFWS, NPS, DoD, LA, MS, AL, FL, and TX to collect samples of both baseline and impacted resources. To date, over 2,000 were collected.

A summary of past and on-going NOAA immediate response actions include:

- Scientific support to the Incident Command through the USCG FOSC;
- Collecting a broad suite of Mussel Watch and other samples for determination of baseline environmental conditions immediately prior to coastal/shoreline contamination by the DWH oil;
- Assessing the safety of seafood and inform appropriate closures of federal waters;
- Evaluating dispersant and oil related to seafood safety – conduct baseline contaminant studies and include post-Katrina data;
- Calculating oil flow from the DWH site to estimate total release of oil;
- Tracking surface oil and dispersant fate and transport;
- Measuring distribution and magnitude of subsurface dispersed oil and dispersant through acoustics, fluorescence studies, water sampling, and other technologies with NOAA Research Vessels and partners, and participating in a related interagency Joint Analysis Group (JAG);
- Measuring impact of subsea dispersed oil on hypoxia events;
- Conducting aerial surveys of protected species distribution and abundance;
- Updating state of the Loop Current hydrodynamics – aircraft deployed ocean profilers and oceanographic cruises;
- Conducting baseline studies of natural resources (water, sediment, biota, human use);
- Developing and conducting studies to measure injuries of trust resources (water, sediment, biota, human use) by oil and or response actions; and,
- Initializing studies on effects of dispersants on marine organisms

**Near-Term Actions**

Assuming oil continues to flow from the well head through August, many of the near-term actions will look similar to the immediate actions. Some longer-term NOAA studies may be developed and undertaken, such as those designed to demonstrate and quantify oceanographic observations and modeling to predict trajectories, injury to natural resources, continued testing of seafood for fishery closure and seafood safety considerations, and studies to gain higher resolution on extent and fate of subsea dispersed oil. Restoration planning will likely commence.
• Continued scientific support to the IC through USCG FOSC (including trajectory predictions, Loop Current evaluation, predicted shore line impacts, etc.).
• Mass balance calculations to understand surface and sub-surface fractions of total release.
• Continued assessment of shoreline oil impacts and support for scientifically appropriate clean-up actions.
• Continued surveys to assess the magnitude, characteristics, fate, transport and near-term effects of subsurface dispersed oil.
• Surveys of potential oil and dispersants in seafood species in closed and open areas.
• Identification and initiation of studies to quantify natural resource injuries.
• Additional human dimensions studies to understand the impact of the event on coastal community, including outreach efforts by Sea Grant.
• Exploring novel mechanisms for engaging the broader scientific community.

Long-Term Actions (2 months-decadal)

Long-term impacts of the spill are likely ecosystem-wide, with particular relevance to various habitat types from salt marshes to deep coral/biogenic communities to human communities. Studies are needed to establish baselines, which are essential to determine the extent of natural resource damages. These studies and baselines include:

• Natural Resource Damage Assessment injury studies;
• Long-term studies of impacted areas, salt marsh productivity, species composition, and geochemistry;
• Ecosystem level restoration needs and opportunities along the northern GOM;
• Long-term assessment of surface ocean productivity (e.g., following the long-term impact(s) to plankton) including ecosystem-wide impacts;
• Long-term impacts to deep communities (e.g., deep water corals);
• Long-term connections between dispersed oil and GOMEX hypoxia events;
• Planning for and initiation of long-term ecosystem and socio-economic impact studies;
• Effects of oil, dispersants, and dispersant-oil mixtures at the surface, sub-surface and atmosphere on LMR and ecosystem processes, productivity, and services; and,
• Effects on key habitats and natural biodiversity, with special emphasis on coastal wetlands and estuarine nursery areas.