

# Research & Development Priorities: Oil Spill Workshop

March 16 - 19, 2009  
University of New Hampshire  
Durham, NH USA

## Spill Response During Disasters

This topic will address issues that are encountered during natural (e.g., earthquakes, hurricanes, floods) or anthropogenic (e.g., accidents) disasters resulting in nearshore and offshore oil spills. Planning and implementation gaps and health and safety issues will be the primary focus. Methodologies for assessments will also be addressed.

## Response Technologies

This topic will address planning, implementation and effectiveness issues for response including: bioremediation, surface washing agents, solidifiers, sorbents, dispersants, and in-situ burning. Gaps in preparing and maintaining methods and technologies, keeping personnel trained in operating the equipment, and operations during spills will be covered. The focus will be on hardware and methodologies.

## Acquisition, Synthesis and Management of Information

This theme will focus on practices and methodologies for accessing and using remote-sensing data, real-time observational data systems, electronic data collection via field surveys, and geographical information systems (GIS) to improve oil spill preparedness, response, assessment, and restoration decision-making. This will include: identification of research needs for hardware and software development for data collection, management, synthesis and interpretation; and hardware, software, and infrastructure requirements/methodologies to fully exploit web-based products and services.

## Human Dimensions

Reducing social impact is paramount for any spill. This topic will address several questions. How does the response community minimize social impacts during a spill event and subsequent response activities? What strategies are used to address the long-term socio-economic effects a spill might have on a region's culture and vitality? How does the response community translate and incorporate social science research, methodologies, and initiatives into its individual and collective response plans? Where does social science research "fit" into the spill management structure, from trajectory models on one side of the ledger to hands-on interaction with individuals that possess the best "local knowledge" of potential human impacts on the other?

## Ecological Monitoring and Recovery Following Spills

Understanding long-term ecological recovery following oil spills informs decisions from response to restoration. What monitoring methods/endpoints are able to cost-, time-, and ecologically-effectively capture environmental services that track natural resource services flowing from impacted habitats? Several questions will be addressed. What ecological factors affect recovery rates? What ecological 'metrics' can be applied using common assessment tools (e.g., Habitat Equivalency Analysis) that will help resource managers develop restoration projects that best compensate for lost resources?



The Coastal Response Research Center  
at the University of New Hampshire



ExxonMobil  
Research and Engineering



### **BioFuels**

Biofuels have hardly been discussed with respect to spill issues. Little is known about first generation biofuel blends, including ethanol/gasoline blends (e.g., E85) and biodiesel blends (e.g., B100, B20), in terms of spill response technologies and determination of fate and effects after a spill. In addition, the fate and effects of second generation biofuels (e.g., biobutanol, hydrotreated vegetable oils); crude oil fractions replacing nitrogen, oxygen, and sulfur with hydrogen; and synfuels (e.g., produced by the Fischer-Tropsch (FT) process) on the environment are unknown. Possible impacts of biofuel blends and synfuels on infrastructure (e.g., storage and dispensing equipment, materials compatibility with metals and gaskets) could lead to more spills if such materials are breached. Waste conversion to energy and processes such as algaeculture (which can produce orders of magnitude more oil per acre than vegetable oil crops)—may also have impacts during spills in the environment. Safety of production and water preservation through closed loop processes will also be discussed.

### **Ecological Effects of Oil Spills**

This topic focuses on long-term effects of residual oil in the environment. What level and types of adverse effects result when oil remains? How much does residual oil matter? The impacts of an oil spill may be magnified, at least locally, by the clean-up technologies used and the effort placed on removing oil from the environment. Steps should be taken to develop a process to select clean-up endpoints, incorporating ecological, toxicological, legal and socio-economic criteria, that is protective without being over invasive (i.e., How Clean is Clean?). R&D projects to retroactively monitor sites of past incidents, in commonly encountered oiled ecosystems (nearshore and offshore environments) will be the focus. Ecological effects beyond species levels, and impacts on resources through effects on competition, predation and habitat function will be prioritized.

### **Environmental Forensics**

Oil spills frequently occur in industrialized areas where there are numerous sources of PAHs, beyond those resulting from the specific incident (e.g., runoff, pyrogenic sources, oily wastes, natural seeps). Chemical fingerprinting to determine the source and extent of oil resulting from an incident are important for clean-up, assessment, recovery monitoring, and associated liability issues. Research needs for this topic will focus on analytical and interpretive methods to advance existing approaches to chemical fingerprinting of spilled oil in the environment.

