The Science of Major Oil Spill Response – Lessons Learned and Present Techniques Used From Pre-planning to On-Scene Activities

Jacqueline Michel and Miles Hayes

Oil-spill response activities carried out by our team since 1975 have included surveys of most of the major oil spills since that time, including the *Ixtoc I* blowout off Mexico in 1979, the *Exxon Valdez* spill in 1989, the Gulf War spill of 1991, and now the Deepwater Horizon spill of 2010. During these responses, several key lessons have been learned that have allowed the development of vital response techniques, such as pre-spill sensitivity mapping of shorelines, devising protection strategies for key areas, and shoreline cleanup assessment team (SCAT) surveys during the actual response. Well-trained SCAT teams that locate and map the oil and give due consideration to the types of techniques to be employed, the personnel and equipment needed, and so on are an essential part of any functional oil-spill response.

With regard to the long-term environmental impacts to shorelines, the key habitats to protect above all others are the sheltered (from wave action) wetlands, such as salt marshes and mangroves. Both exposed and sheltered tidal flats are also very sensitive. For most protection strategies to work, an excellent understanding of coastal processes is required (e.g., tidal current patterns in tidal inlets) to properly implement them.

On the shoreline sensitivity scale that was worked over the years, sand beaches rank lowest of all coastal habitats except exposed rocky shores and concrete seawalls. For example, for shorelines like Louisiana, Florida, or South Carolina, it is better for the oil to come ashore on the beaches of the barrier islands than to move through the tidal inlets into the estuaries behind them, inasmuch as beaches can be cleaned more readily, by both natural wave action and human intervention, than marshes or tidal flats. However, coarser-grained gravel and shell beaches are much more difficult to deal with than pure sand beaches, because of the potential of deep penetration of the oil into the coarser sediment, a valuable lesson learned at the *Exxon Valdez* spill in Alaska, where deeply penetrated oil remains in place in some areas over 20 years after the spill.

[1]Research Planning Inc
PO Box 328 Columbia SC 29202
EMAIL: mhayes@researchplanning.com
TEL: 803-256-7322