held by fire-resistant booms or trapped in ice to ensure that the oil has a minimum thickness to be ignited and sustain burning. The advantages of *in-situ* burning include rapid removal of oil and no need for oil recovery, transport, storage, and disposal. The major disadvantages of *in-situ* burning include the black smoke, difficulties of collecting and containing a large amount of the oil to burn, lower effectiveness as the oil weathers (spreads, emulsifies), and sensitivity to sea state and weather conditions that reduce the viability of all response options (Michel et al., 2004). Worldwide, there have been 43 known intentional *in-situ* burns of oil on water (Fingas, 1999b; Michel et al., 2004). Of these, only thirteen were actual spills (the rest were planned tests). Of these, four were in ice, two were attempts to burn the oil inside the holds of the ship (Torrey Canyon and New Carissa), and four were of uncontained slicks. In the United States, the only on-water *in-situ* burning at a spill was the 1989 test burn during the *Exxon Valdez* oil spill, which was the first time a fire-resistant boom was used at a spill (Michel et al., 2004).

Dispersants are chemical agents (surfactants, solvents, and other compounds) that reduce interfacial tension between oil and water in order to enhance the natural process of dispersion by generating larger numbers of small droplets of oil that are entrained into the water column by wave energy. The small dispersed oil droplets tend not to merge into larger droplets that quickly float back to the water surface and reform into surface slicks. Instead, the small droplets stay suspended in the water column, spreading in three dimensions instead of two and being distributed by turbulent diffusion.

The use of chemical dispersants, as well as *in-situ* burning, revolves around changing the fate of spilled material within the environment, as opposed to attempting recovery or removal of that material from the environment. They are therefore generally viewed in the United States as secondary options intended to support or supplement mechanical response, and requiring risk-based decisionmaking at the time of a spill.

Early efforts to disperse oil slicks on water and along shorelines used degreasing agents or detergents that contained highly toxic components and resulted in high mortality to rocky shore communities (Smith, 1968). Recent formulations are much less toxic such that the toxicity associated with dispersed oil droplets is essentially a function of the toxicity of the oil itself. As a consequence, U.S. policymakers have been exploring the potential for dispersant use for nearly two decades. In 1989, the National Research Council released *Using Oil Spill Dispersants on the Sea*. That report focused on the possible effects and effectiveness of using dispersants to combat spills in open waters. Highlighting a number of specific research efforts that should be pursued, one of the report recommendations was that "dispersants be considered as a potential first response option"