

## Example 4: Oil Spill and Remediation Assessment

The National Academy of Sciences (NAS) appointed Dr. Yasuo Onishi to be a member of a NAS committee to provide a scientific guidance for a national policy of the oil spill, especially the potential use of chemical dispersants as an oil spill response for freshwater, estuarine, and marine environments.

The major responsibility of Dr. Onishi was to evaluate oil transport and fate, especially oil spill modeling. Working closely with the National Oceanic and Atmospheric Administration, he simulated (i) weathering and transport of oil both on water surface and in subsurface water and (ii) oil as a composite of various hydrocarbons, rather than treating oil as one substance as commonly done. These modeling expansions significantly improve the accuracy of oil transport-fate prediction and biological impact assessment.

He conducted a series of three-dimensional oil spill modeling by simulating each pseudo component of oil with and without emergency response activities for both nearshore and offshore waters. Based on his assessment, the NAS recommended a significant change on the use of the models for the dispersant-use decision making.

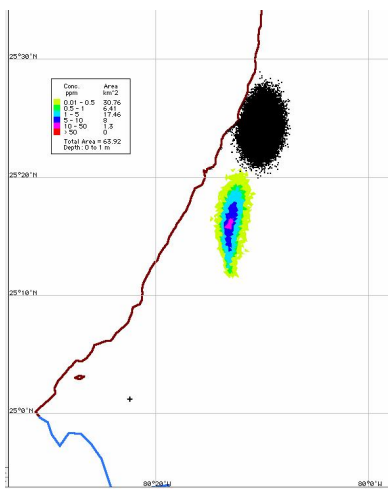


Fig. 1. Predicted oil movement on the water surface (black) and top 1-m water column (colored) with a dispersant application

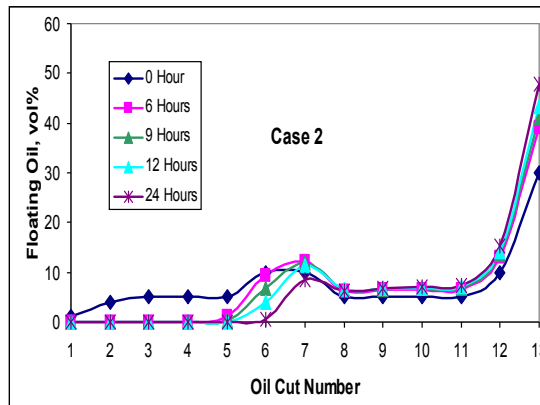


Fig. 2.. Predicted composition of floating oil with a dispersant application