

Approach

BlueWater has been serving a wide range of clients since 1994 in a variety of projects, specializing in the development of Health, Safety, Hazardous Waste Operations, Emergency Response and Environmental Compliance Training. Our approach is simple - to provide a **customized, quality and cost effective** training experience for our clients.



Because of our adherence to this simple philosophy BlueWater has extensive experience with applying regulatory training standards to the specific needs of our clients. Not only do BlueWater courses comply with regulatory standards but they also apply directly to the business and work requirements of our clients. This approach requires us to team closely with your staff to review your operations and maintenance activities, to review and include your policies and procedures training and to incorporate features of the equipment and facilities used by your organization into our course material.

Thus, BlueWater can provide complete one-stop training for your Environmental, Health, Safety, and Emergency Response training needs. We offer flexible training solutions - experienced local instructors for all topics and BWeb remote training. We focus on tailored training and emphasize training management that is “Customer Oriented.” We promote and maintain close ties and coordination with the customer throughout the training design, class instruction, and training completion.

The services offered by BlueWater & Associates are in partnership with the expertise of Applied Science Associates (ASA), a world leader in modeling of oil and hazardous materials in aquatic environments. ASA has developed a comprehensive, integrated modeling system to investigate the fate, response, and impact of a spill. Along with our extensive experience, BlueWater offers our combined expertise to provide complete services for oil and chemical spill response analyses.

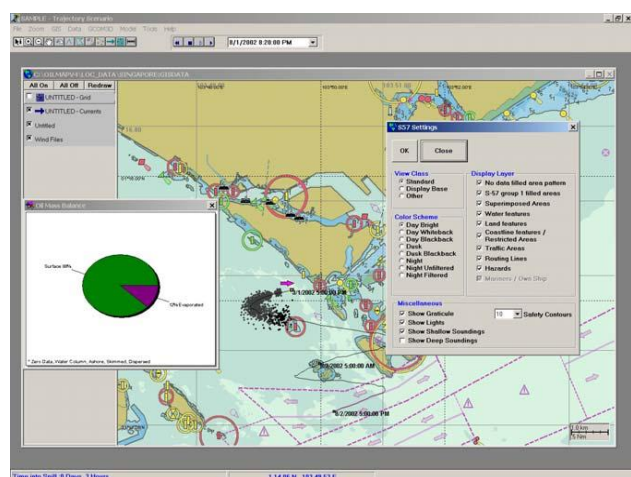


We emphasize our flexibility to meet your needs with local experienced training staff.

Spill Trajectory Modeling

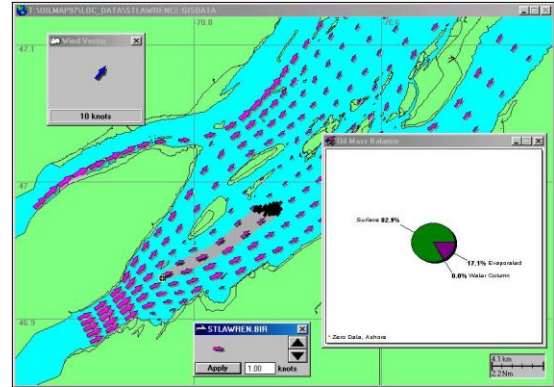
A discharge of oil or chemical into the marine environment is very difficult incident to accurately assess the potential impact or risk to sensitive wildlife environments, commerce, and public sites. Computer based Spill modeling is the accepted tool to determine the relative risk to the environment.

BlueWater utilizes OILMAP® a highly versatile computer based program which allows both rapid modeling of the transport of oil or chemical and to assess the relative impact of environmental factors.



Trajectory and Weathering Model

The oil spill trajectory and weathering model predicts oil trajectories for either instantaneous or continuous release spills and includes algorithms for spreading, evaporation, emulsification, entrainment, oil-shoreline interaction, and oil-ice interaction. The oil's distribution and mass balance are predicted for the type of oil spilled. Model predictions may be up-dated to agree with observed oil.



Receptor Mode (for Oil Vulnerability Analysis)

The receptor mode performs reverse trajectory calculations from user selectable sites. Calculations can be used to identify probable release locations of spills given current oil locations, or principal avenues of vulnerability for important resources. Outputs of the receptor mode are maps showing probabilities that the spill trajectory passed through a given area, and minimum time contours for spills to reach resources of concern. The receptor model is generally used in two modes:

- determine the vulnerability of a particular site (e.g. Desalination Plant)
- determine possible sources of oil when oil has been observed at a particular site. (oil spills based on lightering sites or tanker traffic routes)

Stochastic Mode (for Risk Assessment and Contingency Planning)

This model generates multiple stochastic simulations for user selectable spill locations using statistical or historical wind time series. The model can be run to determine most likely spill paths for spills on a monthly, seasonal, or annual basis. Output includes maps showing probabilities of oiling the water surface and shorelines in the vicinity of the spill site, and contours of oil travel time. Results can be used to determine the probability of oiling static resources (e.g., biological, industrial, archeological) that are stored in the GIS.



Subsurface Transport

This module contains all the weathering algorithms described in the fates and trajectory model, but also predicts the subsurface transport of entrained/dissolved oil. Subsurface particles are generated from the surface oil during the entrainment process and are then forced by mean currents and also a depth varying, wind induced current profile. Resurfacing of subsurface spilllets is included in the formulation.

Additional specialized spill impact analyses can be supported with the expertise of ASA, which build on the base spill model results using SIMAP®

Study Support can include:

- Biological Effects of Spilled Oil
- Impacts on fish, shellfish, and wildlife

OILMAP® model can represent instantaneous or continuous release spills and include algorithms for spreading, evaporation, emulsification, entrainment, oil-shoreline interaction, and oil-ice interaction. The oil's distribution and mass balance are predicted for the type of oil spilled. Model predictions may be up-dated to agree with **observed oil locations**, boom may also be added to implement simple **booming strategies**, and dispersant may be applied to simulate **dispersant application**.

Modeling Tools include:

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| ■ Specify spill scenarios | ■ Enter and edit oil types in the oil library |
| ■ Display spill trajectories | ■ Enter data into OILMAP's Geographic Information System (GIS) |
| ■ Grid any area within the geographic location for model operation | ■ Display GIS resources impacted by the oil trajectory |
| ■ Input wind time series | |
| ■ Generate steady current fields | |
| ■ Generate tidal current fields | |

OILMAP® provides a full function spill trajectory modeling platform to support both current spill risk and spill impact analysis planning requirements. With NOAA's Adios oil database of nearly 1,000 oils or capabilities to add the physical parameters for custom oil.

Modeling Applications include:

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| Predicting the weathering and surface/subsurface transport of spilled oil | Dispersant Application |
| Predicting the probability of key areas being impacted from a given site | Performing risk assessments for important resources |
| Backtracking the model to determine the likely spill site position | Developing Coastal Planning and Management |
| Updating predictions with overflight data | Data Bases using the interactive GIS |
| Incorporating Boom-Oil interaction | Assisting in search and rescue operations |
| | Optional capability to customize a resource and cost management system |

A variety of output formats can be supported as the software uses Microsoft Access Database to store information for each GIS object. The GIS engine supports display of ARCVIEW/ARCINFO shape files directly, as well as OILMAP Native GIS formats, and provides import tools for MAPINFO (MIF/MID) export formats.