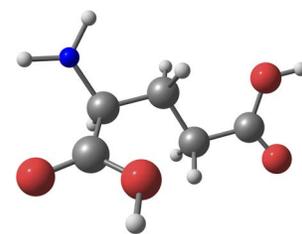# CHEMMAP

CHEMMAP is a chemical dispersion modeling system that predicts the transport, fate, and biological impacts of a wide variety of chemical substances in the marine environment and atmosphere.

There are four implementations available for CHEMMAP:

- **CHEMMAP Desktop:** This robust chemical spill modeling system is suitable for use in chemical spill response as well as planning. Results are dis played and animated in an easy-to-use, GIS based interface. Deployed to a desktop, CHEMMAP can connect and integrate near-real time environmental data to drive the chemical models.
- **CHEMMAPWeb:** This web-based version of CHEMMAP offers similar emergency response capabilities as the desktop version. Acces sible through a web browser from any location, users may share spill scenarios, GIS, and environmental data.
- **CHEMMAP ArcGIS Extension:** Plugs into ArcGIS, allowing users to run chemical spill cases and view animated results directly in ArcGIS.
- **CHEMMAP on the Cloud:** Offering both emergency response and planning capabilities, this modeling system is hosted remotely. Users may log in from a laptop or tablet. As with the web version, multiple users are able to share spill cases and data.
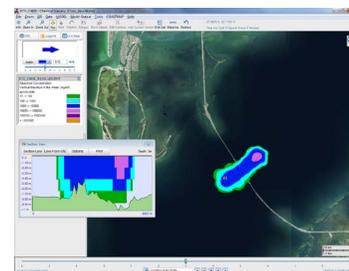
Applications
- Emergency response
- Risk assessment
- Contingency planning
- Natural resource damage assessment
- Drills and education
- Cost-benefit analysis

Features
- The chemical database contains over 800 commonly transported chemicals and products. The database system allows the user to add new chemicals, duplicate chemicals already in the database and make changes to chemical data while preserving the original values
- Contains RPS' own GIS or can be used in other GIS software such as ArcGIS
- Location specific environmental/ biological data applied to any fresh or salt aquatic environment in the world
- Easily interpreted visual displays of concentrations over time
- 3D Viewer capabilities
- Seamless integration of RPS' EDS: Environmental Data Server real-time and historical global environmental data from top data providers

Chemical Fates Model

CHEMMAP simulates the following processes:

- Initial plume dynamics
- Slick spreading, transport, and entrainment of floating materials
- Evaporation and volatilization (to atmosphere)
- Transport and dispersion of dissolved and particulate materials in the water column and in the atmosphere
- Dissolution and adsorption to suspended sediments
- Sedimentation and resuspension
- Natural degradation
- Shoreline entrainment

CHEMMAP Hazard Quotient

For all CHEMMAP model options the Hazard Quotients also known as Predicted Effects Concentrations divided by Predicted No Effects Concentration (PEC/PNEC) can be readily calculated.

Additional Service Based Use

- Range of expected contamination as well as the probability and minimum time of exceeding thresholds of concern from a chemical discharge
- Frequency distribution of model results, for which statistics are calculated and plotted
- Area or water volume exposed above a selected threshold (i.e. a toxicological endpoint)
- Dose (sum of concentration times time of exposure) aquatic biota are exposed to and the expected percent mortality from acute toxic effects
- Direct-contact impacts to birds, mammals, and other wildlife
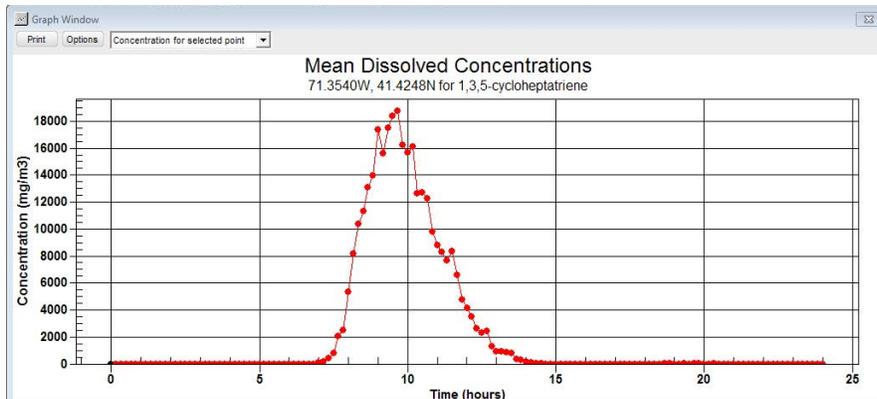
Concentration of dissolved chemical over time at 1km from release site
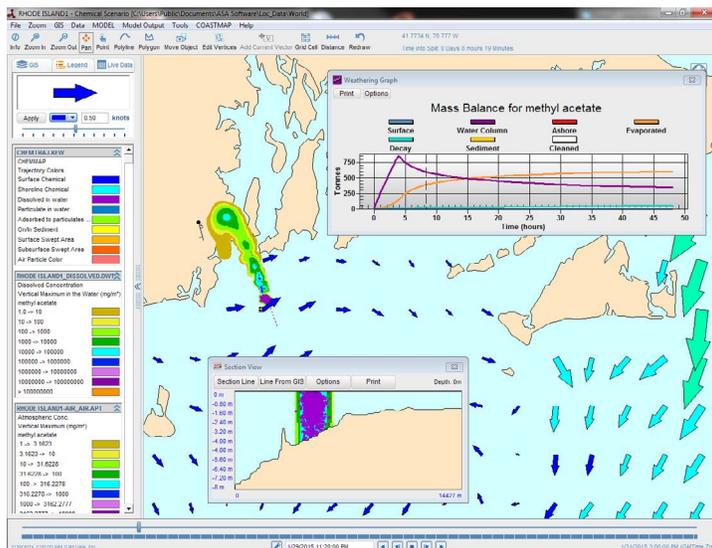
Air concentrations and dissolved chemical with mass balance graph and cross-section of subsurface plume