# CHEMMAP

rps

MAKING
COMPLEX
EASY

# CHEMMAP - CHEMICAL SPILL MODELING SOFTWARE



## Applications of CHEMMAP

- Oil spill response training
- Impact Assessment
- Hindcast/forecast of spill response
- Natural resource damage assessment
- Contingency planning - including worst-case scenario
- Evaluation of point source discharges
- Cost-benefit analysis
- Drills and education

## Features

- Contains RPS' own GIS or can be used in other GIS software such as ArcView®
- Location specific environmental/biological data applied to any fresh or salt aquatic environment in the world
- Can utilize a variety of hydrodynamic file formats
- Easily interpreted visual displays of concentrations over time
- 3D Viewer capabilities
- Biological exposure model to predict exposed fish and wildlife impacts
- MSDS database linked to the physical-chemical database
- Extensive chemical database providing physical-chemical data
- Seamless integration of RPS' EDS: Environmental Data Server™ real-time and historical global environmental data from top data providers

## CHEMMAP Highlights

- Contingency planning - including worst-case scenario
- Chemical Fates Model
- Biological Exposure and Effects Model
- Stochastic Model
- Hazard Quotient Calculations
- Interactive GIS
- Environmental, Chemical & Biological Databases
- EDS: Environmental Data Server™ integration

## Model Modules

### 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
- Boom and dispersant effectiveness

### 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.
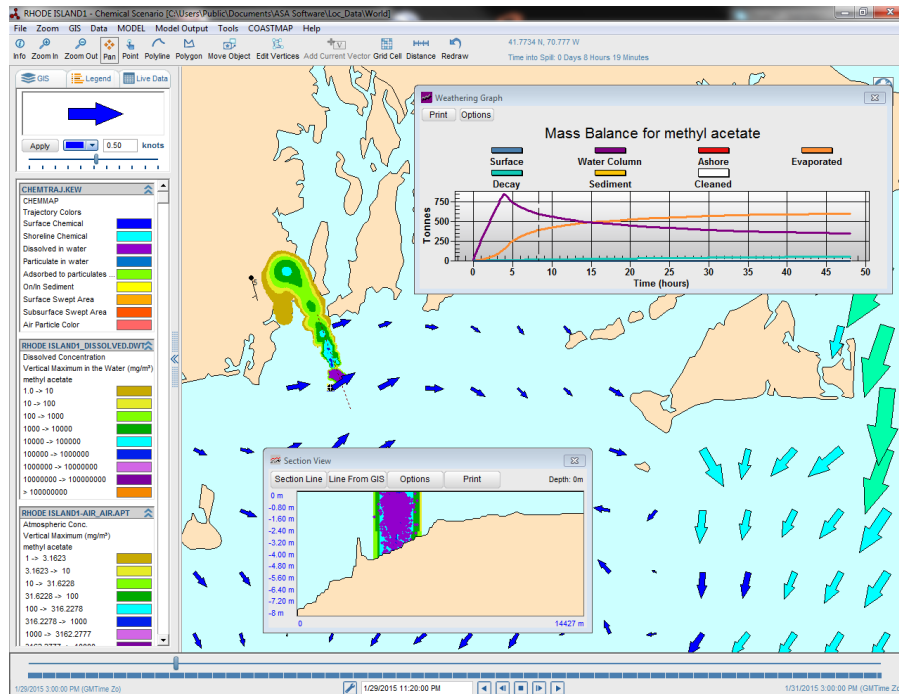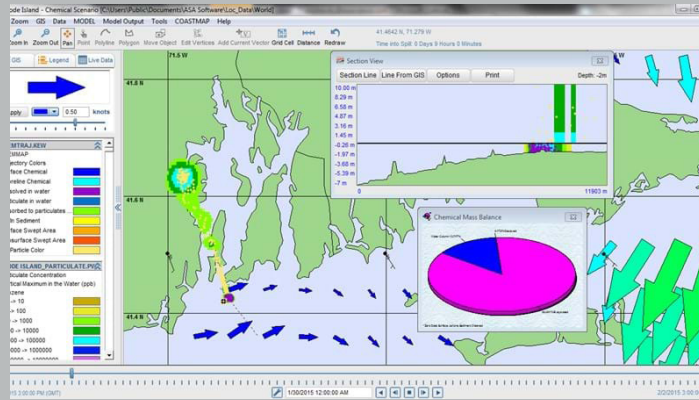


### Biological Exposure and Effects Model

The biological exposure model evaluates:

- Area or water volume exposed above a slected threshold (i.e. a toxicological endpoint in U.S. EPA ecological risk assessment terminology)
- 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



### Stochastic Model

The stochastic model predicts:

- Range of expected contamination and the probability of exceeding thresh olds of concern from a chemical discharge
- Frequency distribution of model results, for which statistics are calculated and plotted Environmental, Chemical and Biological Databases
- Environmental database - includes coastline, bathymetry, shoreline type, ecological habitat type, and temporally varying ice coverage, temperature, and salinity
- Chemical database - includes physical-chemical parameters that allow the user to add new chemicals, duplicate chemicals already in the database and make changes to chemical data while preserving the original values. There is a link to ChemWatch Chemical Management System's comprehensive Health and Safety information
- Biological databases - can be set up for any area of the world. For the U.S., RPS has developed a biological database containing seasonal or monthly mean abundance by species and habitat type for each biogeographic region of the U.S.

### For more information

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