

Demonstration of ERMS Drilling Model

Mark Reed

SINTEF Marine Environmental Technology

ERMS Final Seminar

Oslo

September 27, 2007

DREAM: brief history of the software

- NRDAM: natural resource damage assessment model developed in USA 1985 – 1996
 - Circa \$US 2 million in development and testing
 - Open code
- Provided the basis for ProVann
 - Produced water exposure model developed for Statoil in 1994-5
 - Single chemical component model
- DREAM
 - Advanced produced water model (1996 – 1999)
 - Statoil, Eni, Norsk Hydro, Elf, SINTEF, TNO, Akvamiljø
 - Complex mixtures of chemicals
 - Focus on environmental risk assessment
- ERMS
 - Integration of drilling discharges into DREAM framework
 - Total, Petrobras, Shell, Eni, Hydro, Conoco-Phillips, ExxonMobil, Statoil, SINTEF, TNO, Akvamiljø, Akvaplan-Niva

Model setup: Setup Wizard for data input

The screenshot displays the 'Marine Environmental Modelling Workbench' software interface. The main window shows a map of the North Atlantic region with a 100 km scale bar. Two 'Drilling Discharge' dialog boxes are open, both for 'Basecase-07'.

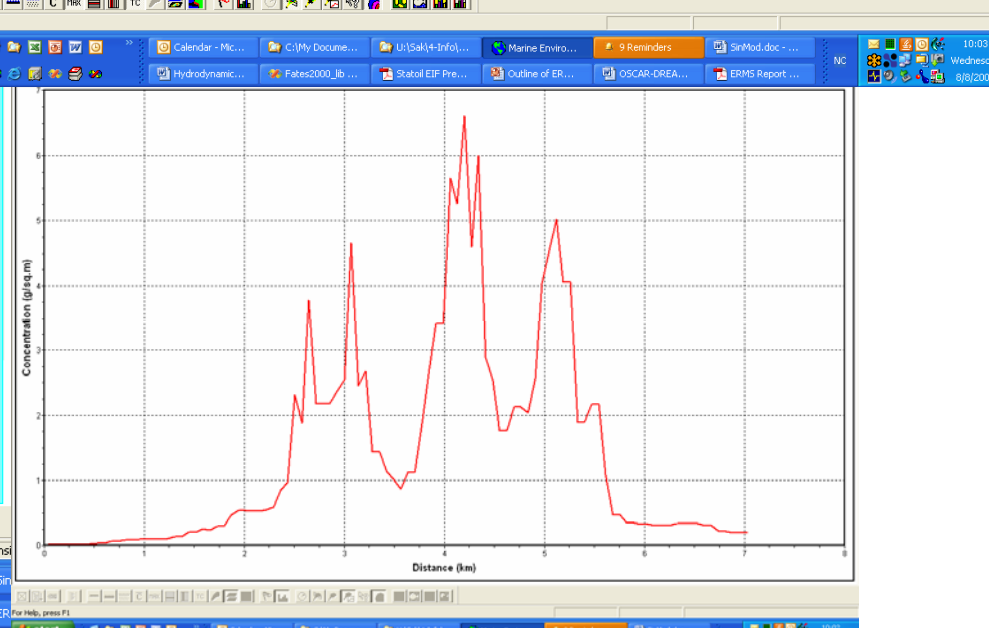
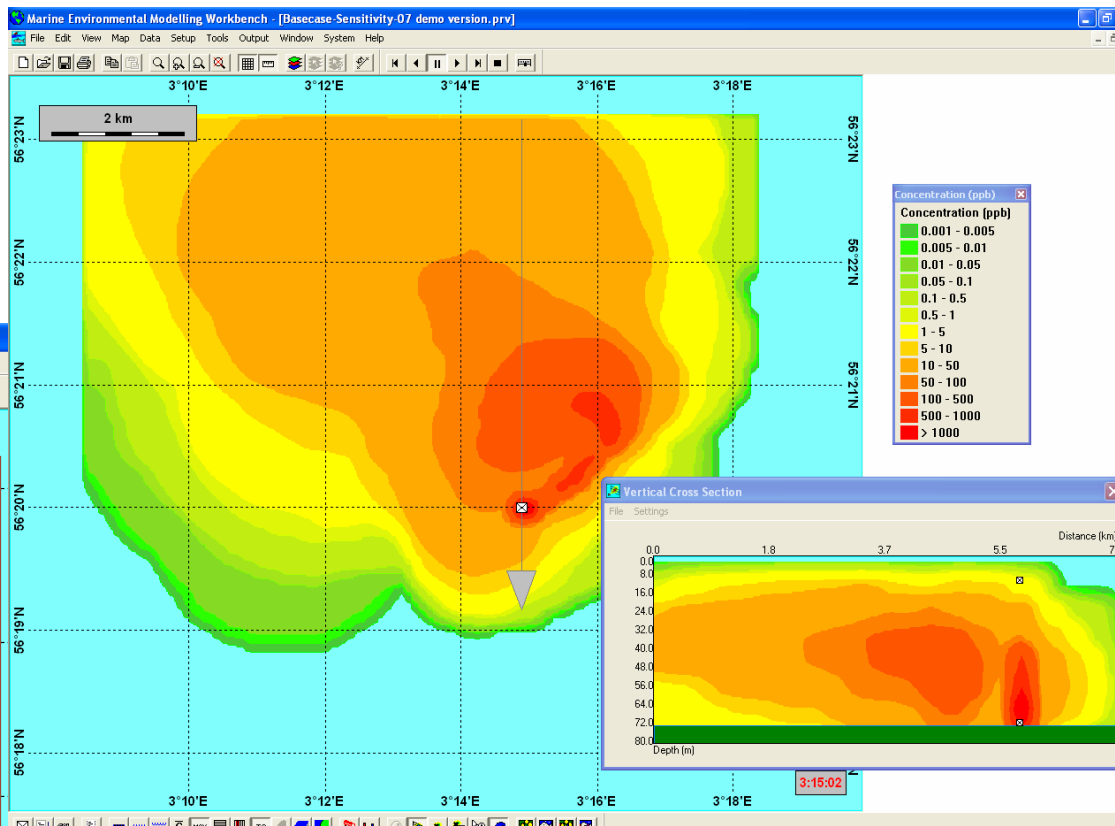
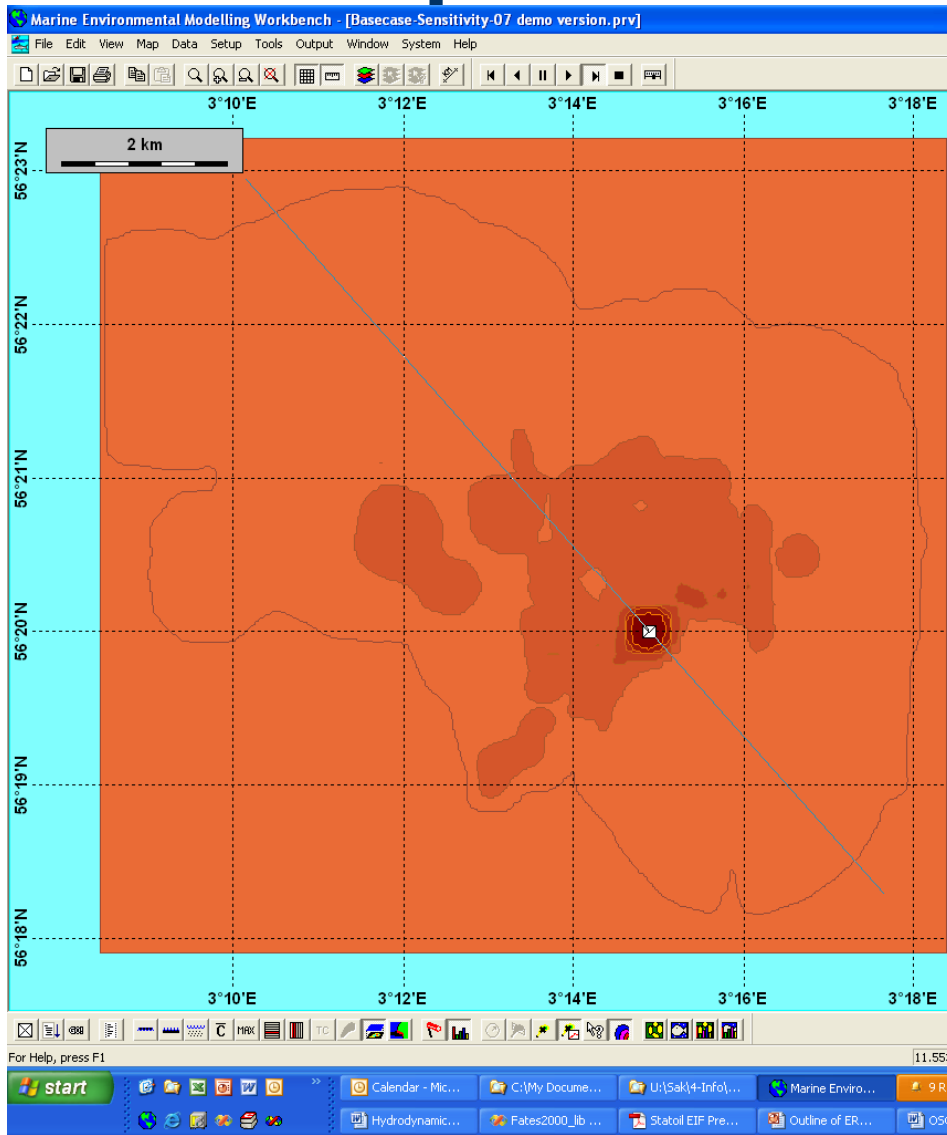
Left Dialog: Drilling Discharge

- Site name: Basecase-07
- Location: Longitude: 3 deg 14.8973 min East; Latitude: 56 deg 19.9960 min North
- Repeated drilling: Repeat interval: 0 days
- Section: 2 of 2
- Section Info | Components
- Start of discharge: 1 hrs; Near field model: Plume3D
- Discharge type: drilling discharge; Outlet diameter: 0.5 m
- Section length: 1775 m; Angle from north: 0 deg
- Drilling rate: 25 m/h; Angle from vertical: 180 deg
- Duration of drilling: 71.000 hrs; Droplet size: Minimum size: 10 µm, Maximum size: 100 µm, Characteristic size: 50 µm
- Wellbore diameter: 16 inches
- Wellbore washout: 10 %
- Discharge depth: 10 m; Discharge reference: below sea surface
- Discharge temp.: 10 °C; Disch. wat. salinity: 35 ppt; Agglomerate: ; Auto-Attach:
- Number of data points: 20
- Buttons: New Section, Copy Section, Remove Section, Make Release Sites

Right Dialog: Drilling Discharge

- Site name: Basecase-07
- Location: Longitude: 3 deg 14.8973 min East; Latitude: 56 deg 19.9960 min North
- Repeated drilling: Repeat interval: 0 days
- Section: 2 of 2
- Section Info | Components
- Cutting Component: EIF_Cuttings-base; Total amount: 607.854 tons
- Mud Components in tons: EIF_Barite (40.000), Dissolving-chem (6.000)
- Total mud: 675 tons
- Additive Chemicals in tons: (empty table)
- Attached Chemicals: EIF_Cadmium_Barite (EIF_Ba...) (2.000 ppm), EIF_Zinc_Barite (EIF_Barite) (140.000 ppm), EIF_Copper_Barite (EIF_Barite) (50.000 ppm), Agglom-chem_Ba (EIF_Barite) (1.000e+05 ppm)
- Buttons: New Section, Copy Section, Remove Section, Make Release Sites

Model output animations: release phase



Model output animations: risk analysis

Time development chart

