Norwegian Meteorological Institute
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Mersea Oil Spill Drift Forecast Demonstrations in TOP2

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Summary

• Aim: Show that Mersea products enhance oil spill forecasting services:
  - Improve the accuracy of existing services
  - Broaden scope of European services
  - Facilitate new forecasting products (“PEPS”)

• Demonstrations will be carried out during TOP2
  - Address the items above
  - Get the attention of users
  - “Basic problem with oil spill demos: we prefer that oil spills don't occur” ⇒ do scenarios and validation experiments
Outline

• What's required by oil spill forecast services (briefly)
• What will be done in the Demos
  - Eastern Mediterranean validation
  - Western Mediterranean validation
  - Barents Sea scenario
  - Agulhas area scenario
Oil spill model data requirements

• Info on oil spill: location, time, oil type
• Forcing fields:
  - Ocean circulation:
    • Currents: 3D, preferably with tides
    • T/S: 3D for some oil models
  - Atmosphere:
    • Winds
  - Waves:
    • Significant wave height and period
    • Stokes drift
  - Available within minutes of an emergency request
  - Available for several days back and prognoses ahead for emergency requests
  - Daily feeds or on-demand downloads of external data
DEM0 Eastern Med - why here?

- Heavily used shipping lanes
- Important economic interests on coasts (tourism, recreation)
- Large current variability, non-tidal
- UCY has strong ties to users

Lebanon, 2006: Stranded oil from Jiyeh power plant

Tanker routes in the Mediterranean
DEMO Eastern Med - plans

- **Demo type:** Validation by drifter tracking
- **Time schedule:** late September 2007
- **Where:** south of Cyprus
- **Partners involved:** UCY, MF, met.no
- **Users involved:**
  - Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC)
  - Cyprus Dept of Fisheries & Marine Research
  - Cyprus Department of Merchant Shipping

Oil-emulating surface drifters to be used in the demo
**DEMO Eastern Med - data products**

- **SKIRON winds**
- **Downscaled Mersea (MFS) currents**
- **MERIS imagery**
- **MEDSLIK oil spill forecast**

Also, drifter trajectories, MF and met.no oil spill forecasts based on Mersea ocean products.

**SKIRON winds**

- MFS basin model at 7 km
- ALERM0 sub-regional model at 3 km
- CYCOFOS shelf model at 1.5 km
DEM Western Med - why here?

- Heavily used shipping lanes
- Important economic interests on coasts
- Large current variability, non-tidal
- Opportunity with Cedre nearby
The red star is the starting point (August 23rd).

Red diamond is the observation on Sept 5th.

Black spots figure the final position of the slick for Sept 5th.
DEMO Western Med - plans

- **Demo type**: Validation by drifter tracking
- **Time schedule**: week 39/40 2007
- **Partners involved**: met.no, (Cedre), MF, UCY, IFREMER
- **Users involved**:
  - CROSS (French MRCC)
  - Prefecture Maritime
  - Secretariat General de la Mer
  - IFREMER

Example of using drifters to monitor leakage from Prestige wreck
DEMO Barents Sea - why here?

- Increasing tanker traffic
- Increasing offshore petroleum activity
- Large fisheries and sensitive ecosystems
- Harsh environment, sea ice
- Challenging area for weather, ocean forecasting
DEMO Barents Sea - plans

- **Demo type**: Scenario simulations - wellhead blowout
- **Time schedule**: October 2007
- **Partners involved**: met.no, MF
- **Users involved**:
  - Norwegian Coastal Administration (KV)
  - Norwegian Clean Seas Association of Offshore Operators (NOFO)
  - Norwegian Navy

Oil/gas plumes from deep source handled by DeepBlow module (SINTEF/met.no)
DEMO Barents Sea - data products

- **OD3D** oil spill forecasts based on:
  - Ocean forcing fields from met.no (nested in TOPAZ) and Mersea (TOPAZ, Mercator)
  - Atmos and wave forcing fields from met.no and ECMWF

- **MOTHY** oil spill forecasts based on similar

- **Data delivery:**
  - tailored data files to KV / NOFO
  - WMS client embedded in web user interface
DEMO Barents Sea - data products

WMS client for oil spill, atmos, ocean, wave data

Menu for drift forecasts

Oil spill order form
DEMOf Agulhas – why here?

- Outside European waters - demonstrate global capacity of Mersea
- Heavy tanker traffic
- Harsh environment - currents, waves
- Challenging area for weather, ocean forecasting

Map of Agulhas area with ECMWF winds and Mercator currents on a sample oil spill grid
Demo type: Scenario simulation
- damaged tanker adrift*
Time schedule: November 2007
Partners involved: met.no, MF
Users involved:
- Norwegian Coastal Administration (KV)
- Norwegian Clean Seas Association of Offshore Operators (NOFO)
- Navy
- ...

Scenario similar to Prestige
DEMO Agulhas - data products

- OD3D oil spill and coupled ship drift* forecasts based on:
  - Ocean forcing fields from Mersea (Mercator)
  - Atmos and wave forcing fields from ECMWF
- MOTHY oil spill forecasts based on similar
- Data delivery:
  - Ascii data files
  - WMS client embedded in web user interface
DEMO Agulhas - data products

WMS client for oil spill, atmos, ocean, wave data

Menu for drift forecasts  Oil spill order form
End