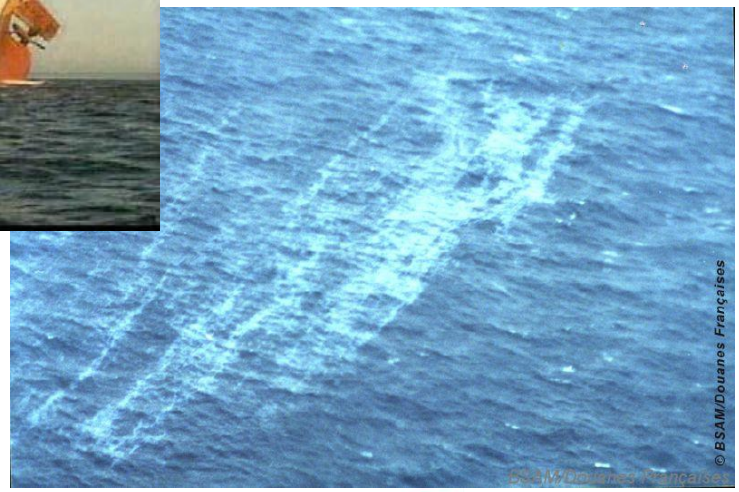
HNS-MS modelling strategy



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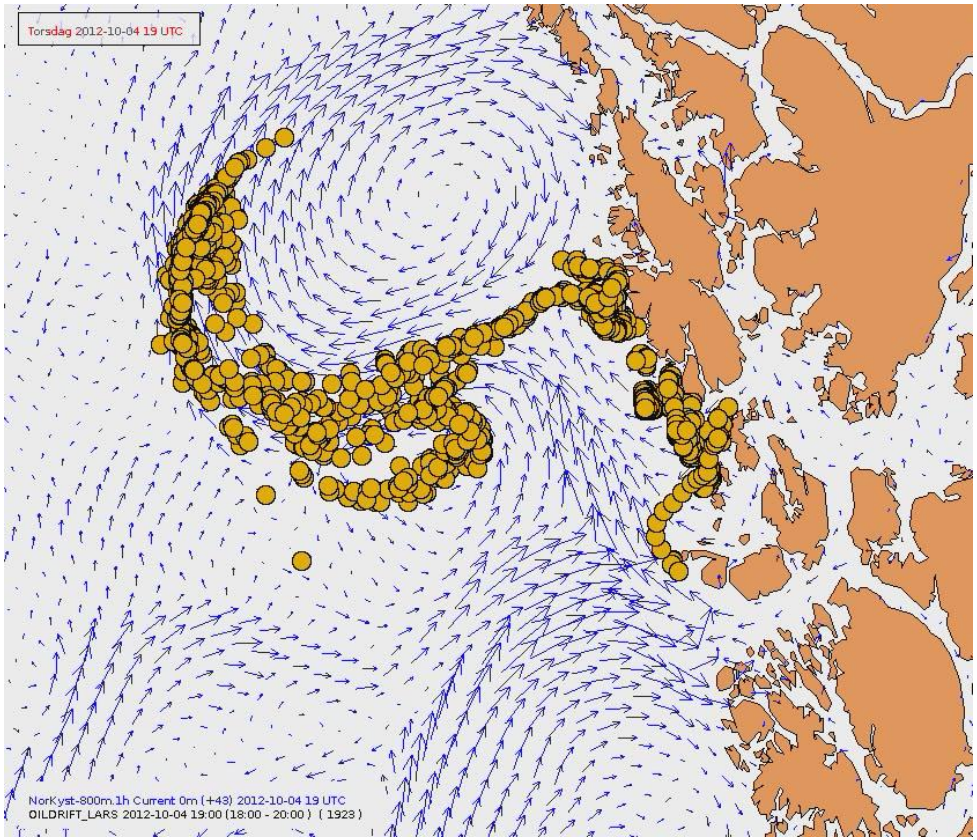
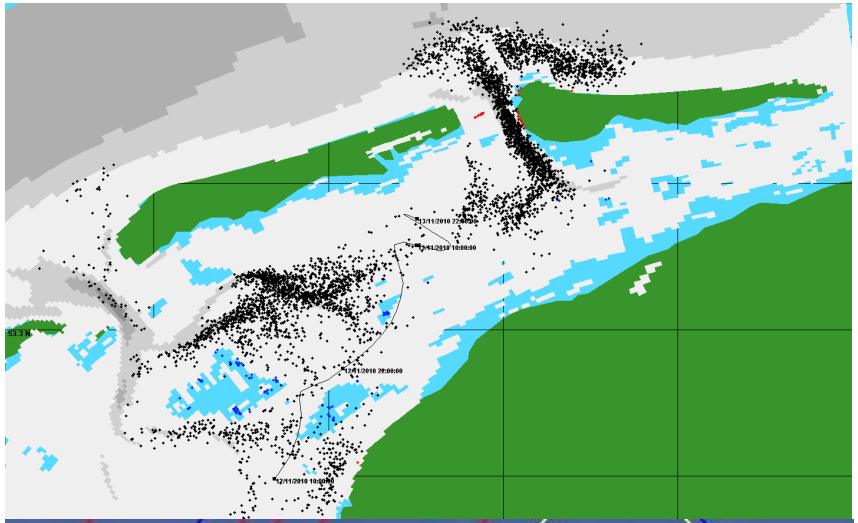
Lagrangian approach commonly used in oil spill drift and fate modelling





Co-funded by the European Commission, DG-ECHO

The challenge : HNS spill drift, behaviour and fate model

- Wide variety of products
  - Liquids, solids, gas
  - wide range of physico-chemical properties
- Wide variety of HNS behaviours at sea
  - Competition between Floater, Sinker, Evaporator, Dissolver
  - Chemical and physical reactivity
  - Interaction with environment (SPM, beaching, resuspension,…)
  - Wide range of time and space scales involved
- Various transport conditions
  - Bulk or package in containers or drums
- Wide variety of possible accidents or spill release conditions
  - Adverse weather leading to unstable cargo / ship, lost of containers,…
  - collisions, capsizing, hull damage, grounding, sinking,…
  - Danger of fire, explosion, chemical reaction in cargo, …

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Some simplifications are needed in order to better define the range of applicability of the model to be developed

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Bonn Agreement
Accord de Bonn

Some simplifications are required, especially in a framework of a 2 year project !

"Let's focus on one region
and be a demonstrator for the other regions"

- Area of interest :
  - Bonn Agreement area
  - Bay of Biscay

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"Let's focus on a limited number of process"

- Out of the scope of this first project:
  - Chemical reactions
  - Explosion and fire
  - Interaction with SPM

Let's separate the time and space scales: a 3 models approach.

HNS-MS near-field model

focus on fast processes such as resurfacing and dilution for subsurface releases

HNS-MS far-field model for slower processes

Focus on transport

Gaussian atmospheric dispersion model

Let's focus on the most likely HNS spill scenarios "Initial conditions"

Observed pollution

1. At the sea surface
   a. Small to medium spills
   b. Elongated spills
2. Observed in the water column
3. Observed at the sea floor

Backward and forward in time

From a known source

4. From a moving vessel
5. From a sunk vessel
   a. Discharge rate prescribed
   b. Discharge rate computed
6. From a broken pipeline
   a. Discharge rate prescribed
   b. Discharge rate computed
7. From a land source
8. Gas release in the atmosphere
9. From leaking containers adrift

Only forward in time

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