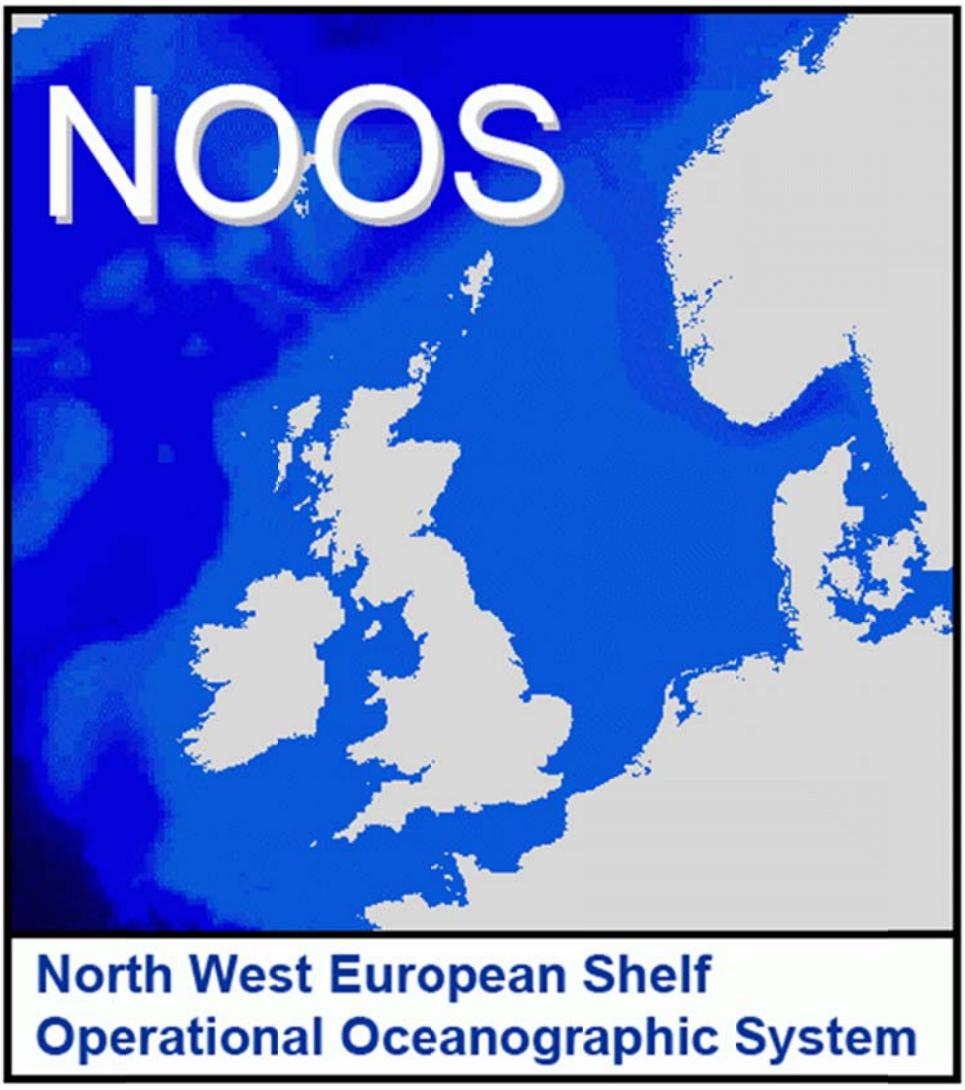
Report of the NOOS Working Group on Drift



21st and 22nd of January 2013

at RBINS-MUMM, Brussels, Belgium

Revision history

Version	Date	Changed done by	Description
0.0	**July 2013**	**S. Legrand**	**First version**
0.1	**August 2013**	**P. Daniel**	**Mothy in in-house models list**
0.2	**August 2013**	**S. Massmann**	**Small spelling corrections**

Contents

Introduction

The NOOS working group on drift gathers experts from 10 Institutes that develop, maintain and operate operational drift forecast services on the Greater North Sea and the European North West Continental Shelf.

At the total, 11 different drift models are used within the working group. Seven of them are “in-house” models: **OD3D** (developed and used by met.no), **SeaTrackWeb** (SMHI, FCOO, BSH), **BSHdmod.L** (BSH), **Float** (RBINS-MUMM), **OSERIT** (RBINS-MUMM), **CEFAS SPILL** (CEFAS), **OILTRANS** (MI) and **MOTHY** (Meteo-France)). The other ones are commercial solutions: **OSCAR** (used by met.no and CEFAS), **OILMAP** (RWS, Deltares and CEFAS) and **CHEMMAP** (RWS, Deltares). The different teams have their own planning of development. However they are all facing similar issues or sharing common interests.

Since its rebirth at the NOOS annual meeting 2009, the working group worked in an informal but fruitful collaborative basis. However, in order to consolidate the working group activities, there was a need to formalize the terms of reference of the working group and also to agree on a common roadmap. These were the objectives of the meeting that has been held on the 21st and 22nd of January at RBINS-MUMM premises, Brussels, Belgium.

During the meeting, each participant had the opportunity to present his/her modeling tool(s) and operational service(s) as well as his/her expectations for the working group. The presentations have been uploaded on the wiki site. The identified shared interests were the starting point for the discussions of the second day, including the definition of the terms of reference and the roadmap.

The present report summarizes the discussions and decisions of the meeting, i.e. the new terms of reference of the working group and the road map for the next 3 years. The list of shared interest is provided in Annex B.

Terms of reference and organization

Purpose of the NOOS Working Group on Drift

The NOOS Working Group on Drift is a focal point centralising all possible collaborations and co-operations between NOOS member institutes and NOOS associated member institutes that could improve the accuracy of operational drift forecast services operated on the Greater North Sea. Those services have proved their interest as a support tool to decision makers in various fields such as oil and chemical pollution, search and rescue activities, fish stock management (fish larvae transport), water quality management (harmful algae blooms transport), marine litters management...

The general objectives of the Working Group are

- The promotion and the facilitation of information exchange on drift modelling, data, databases and validation cases (real cases and benchmarks);
- The sharing of best practices and operational experiences;
- The coordination of model to model comparison and validation studies as well as post-crisis assessments;
- The coordination of common experiences at sea with drifters;
- The promotion of interoperability of the different operational model systems and services operated on the Greater North Sea.

Organization

1. The members of the NOOS working group on drift are any NOOS member institutes or NOOS associated member institutes that have expressed an interest for the working group objectives and/or activities.
2. The members of the NOOS working group on drift meet every three years during a dedicated meeting to discuss the progress made by the working group over the last 3 years and to define the specific objectives for the next 3 years.
3. Every member of the NOOS working group on drift may suggest a new activity in relation with the working objectives and/or priorities.
4. Every member of the NOOS working group on drift may participate to a working group activity on a voluntary basis, depending on its interest and its available resources. However, whenever possible, it is expected that external projects will be sought to speed up the working group progress.
5. The progresses of the NOOS working group on drift are periodically reported at the NOOS annual meetings and at the NOOS steering group meetings.

Specific objectives for 2013-2015

From the list of common interests (Annex B), the working group has identified the following specific objectives and priorities for the next 3 years. Those mainly span model validation and post-crisis assessment, data exchange, model interoperability and communication. However, that list may change in function of the funding opportunities and stakeholders' feedbacks. This is especially true for all the scientific issues that have not been retained but that are listed in Annex B.

Model validation and post-crisis assessment

Model validation is the highest priority action identified by the working group. This includes:

- Building a detailed and documented data base of real case situations. For instance, the "full-city accident", "the "Golden Trader" accident, "Gannet Oil Field leak", "Duncan Island", "MSC Napoli", "Ice Prince", "Baltic Ace"…
- Organizing yearly campaign deploying drifters in the North Sea.
- Organizing model to model validation against any case of opportunity.

Data exchange

- Listing known oil database.
- Listing known wind drift coefficient data base for search and rescue objects and containers.
- Accessing in-situ observations of current, waves and wind measurements that could be used for met-ocean forcing validation.
    - a lot of data already exists from the NOOS in-situ data portal: http://nwsportal.bsh.de/
    - Do we need to extend the NOOS data set with the met-ocean data collected by the oil industry companies, as for instance http://www.simorc.org/

Interoperability

- Creating a contact list
- Identifying which model can be used as back-up solution
- Towards ensemble simulations :
    - Organizing the exchange of met-ocean forcing.
    - Defining a common file format to exchange drift forecast.

Intern communication

- Updating working group members with the development done at the national level by sharing news, reports, articles…
- Continuing developing the wiki site https://wiki.met.no/noos/start

Outreach

- Promoting the working group to our stakeholders such as the national MRCC and coastguard agencies, Bonn Agreement and our national contact point for JPI-Ocean and GMES/Copernicus.
- Promoting the working group activities in specific conferences and workshops

Proposed activities for 2013

Communication and outreach

Leader/Participants	Activity
S. Legrand, all	Oral presentation of the NOOS working group on drift at the CEDRE information Day 2013, Paris, France, 27th of March 2013: http://www.cedre.fr/en/publication/information-day/2013.php
S. Legrand, all	Presentation of the new term of references at the NOOS steering group meeting 2013, Cork, Ireland, 17 April 2013
S. Legrand, all	Presentation of the working group progress at the NOOS annual meeting 2013, euroGOOS office, Brussels, Belgium, 11-12 September 2013
S. Legrand, all	Oral presentation of the NOOS working group on drift at the workshop on deepwater oilspill modeling, Aberdeen, Scotland, on 18-19 September 2013
V. Dulière, S. Massmann, P. Daniel	Poster on validation, Futoore 2013, Hamburg, Germany, 8-10 oct 2013 http://futoore.bsh.de/FutOOre/index.htm
All	Promoting the working group to your national contact point for JPI-Ocean, Copernicus and Bonn Agreement

Model validation

Leader/Participants	Activity
S. Massman, V. Dulière, J. Rees and P. Daniel	Model to model validation against the track of the CEFAS buoy that was drifting in December 2012
F. Kleissen, J. Rees and V. Dulière	Post-crisis assessment of the Baltic Ace accident
L. Hole, S. Massmann + ???	Deployment of met.no ispheres in North Sea Postpone : there are some administrative or legal issues that must first be solved
All	Check if some isphere drifters may be bought to participate to the yearly drifter campaign
No leader defined yet	Building a detailed and documented data base of real case situations. For instance, the ”full-city accident”, the “Golden Trader” accident, “Gannet Oil Field leak”, “Duncan Island”, “MSC Napoli”, “Ice Prince”, “Baltic Ace”… For each case, should be provided ➢ a description of the accident; ➢ Factual elements that could be used for model validation (e.g. impacted areas, beaching area, on scene observations with time and position, satellite images,…); ➢ Whenever possible, a set of met-ocean forcing that could be used for testing the case

Data exchange

Leader/Participants	Activity
J. Rees, ???	Exchange of information on chemical behavior and chemical databases
No leader defined yet	Exchange of in-situ data for wind, waves and current useful for model validation other than those available in http://nwsportal.bsh.de/, http://www.simorc.org/
No leader defined yet	Listing known oil database
No leader defined yet	Listing known wind drift coefficient data base for search and rescue objects and containers.

Interoperability

Leader/Participants	Activity
S. Legrand	Creating a contact list with the members of the working group
S. Legrand, all	Identifying the possible back-up systems, i.e. the national services to which the working group members could easily become registered users.

Annex A

List of participants to Brussels meeting

Were present:

- RBINS-MUMM : S. Legrand, J. Ozer and V. Dulière
- BSH: Silvia Massmann
- CEFAS : Jon Rees
- Deltares : Frank Kleissen
- FCOO: Johan Mattsson
- meteo-france : P. Daniel
- met.no : A. Carrasco, L. Hole
- MI : Alan Berry

Were excused:

- RWS: Jan Rolf Hendriks
- SMHI: Linda de Vries

Annex B

List of Identified common interests

2.1 Exchange of information on drift modelling and best operational practices

- How to calibrate the sub-grid scale horizontal dispersion and the diffusivity coefficient of the random walk?
- How waves impact the behaviour of the slick?
- How does high resolution met-ocean forcing improve oil drift and fate forecast?
- What is the best initialisation procedure? How to initialise oil weathering?
- How to share oil and other chemical databases? Wind drift coefficients? Common GIS data base?
- How to better represent the vertical structure of the horizontal stokes drift?
- How to take benefit of satellite images? How to link with CleanSeaNet?

2.2 Identification of new challenges and long term development

- How weathering processes impact the drift? Do fresh oil, emulsified oil and pancakes drift at the same speed? How to take into account the rheology processes?
- How bridging the gap between short term and long term simulations?
- How to model deep water spills and blow-outs with complex horizontal and vertical plumes?
- How to model application of chemical dispersants for subsurface spills? Could SINTEF or CEDRE help to determine the size of the dispersed oil droplets?
- How to model oil-sediment interactions and sedimentation?
- How to model ice-oil interactions?
- How to improve near-shore physics and beaching processes?
- How to represent the influence of small scale on large scale hydrodynamics and drift? (e.g. Langmuir cells?)
- …

2.3 Validation cases, model to model comparison and post-crisis assessments

- Need for more validation cases on real but also opportunity cases
- Need for regular joint validation and risk assessments exercise as for the Baltic Ace wreck

2.4 Multi-model approach as the best way to quantify uncertainty on drift forecast

- Be sure to have a common definition of uncertainty
- poor man ensemble
- hindcast ensemble
- EPS and multi forcing ensemble
- Multi-model/multi-forcing ensemble

2.5 Model interoperability

- Write and maintain a contact list with name, phone, email …
- The working group could act as a back-up solution in case of local system failure
- Exchange of model forcing (ocean forecasts are the component with greatest scope for improvement)
- Exchange of drift results.
- Need for definition of a common standard file format for forcing and/or drift trajectory exchanges.