



# MARCH 11 2015

## OIL SPILL STUDIES

### Final Conference

Oil Spill Studies (6<sup>th</sup> edition) will focus on project results and in particular the three in-situ experiments of oil-spill booms carried out with local partners in charge of spill response in Falmouth (UK), Lisbon (PT) and Rochefort (FR). To improve Oil Spill Contingency plans we propose a decision support tool for oil boom positioning based on information about currents, waves, oil and different type of booms.

Speakers will include other experts in the field of pollution preparedness and response.



**WELCOME TO  
EIGSI**

**RESEARCH RESULTS  
ON OIL SPILL  
RESPONSE TOOLS**

**SPEAKERS FROM  
ACADEMIA AND  
INDUSTRY**

**FOCUSING ON  
LOCAL POLICIES IN  
FAVOUR OF MARINE  
POLLUTION  
PREPAREDNESS**

**EUROPEAN  
RESEARCH FUNDED  
BY DG ECHO**

**EIGSI**

26 rue de Vaux de Foletier  
17000 La Rochelle

[www.isdamp.eu](http://www.isdamp.eu)

March 11<sup>th</sup> 9:30 -18:00

# ACKNOWLEDGMENTS

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DG-ECHO. Grant Agreement No. 638516/2012/ECHO/A5/SU*



# 6<sup>th</sup> Oil Spill Studies Workshop

Hosted by

EIGSI Engineering School

26 rue de Vaux de Foletier, La Rochelle, France



WEDNESDAY, MARCH 11<sup>TH</sup>, 2015

9 : 0 0 - 9 : 3 0	<b>Welcome, coffee</b>
9 : 3 0 - 9 : 4 5	<b>Opening Remarks</b>
9 : 4 5 - 1 3 : 4 5	<b>Morning session</b>
	ISDAMP Project: Improving Shorelines Defenses Against Marine Pollution. <i>Frédéric Muttin, ISDAMP Project, France/UK/Portugal</i>
	Coastal sensitivity indices <i>Paul Fattal, Université de Nantes, France</i>
	Multibiomarker approach in the estuarine species under chronic and acute pollution conditions : a realistic measure of environmental quality of the Marina of La Rochelle <i>Marine Breitwieser et al, Université de La Rochelle, France</i>
	Falmouth Harbour Commissioners' pollution preparedness and training. <i>Duncan Paul, FHC, Cornwall, UK</i>
1 2 : 4 5 - 1 4 : 0 0	<b>Lunch</b>
1 4 : 0 0 - 1 7 : 0 0	<b>Afternoon session</b>
	Improving compensation from oil spills: a lawyer's perspective. <i>Yann Rabuteau, ALLEGANS, Brest France</i>
	A software framework to improve preparedness and response activities to marine pollution incidents. <i>Frank Braunschweig, Action Modulers, Portugal</i>
	Using high resolution metocean forecasting systems to improve preparedness and response activities to marine pollution incidents. <i>Claudia Viegas et al, IST, Portugal</i>
	Booming strategies in small harbours: From modeling to real life tests <i>Thomas Ternisien &amp; Rose Campbell, EIGSI, La Rochelle, France</i>
2 0 : 0 0	<b>Dinner (Restaurant in City Centre, please confirm attendance)</b>



## Acknowledgments

The ISDAMP Project is co-funded by the European Union "Humanitarian Aid and Civil Protection" DG-ECHO. Grant Agreement No. 638516/2012/ECHO/A5/SU



Humanitarian Aid and Civil Protection

# ABSTRACTS

## ISDAMP+ Improving Shorelines Defenses Against Marine Pollution

*Frédéric Muttin, EIGSI, La Rochelle, France*

ISDAMP is a European Project (DG-ECHO) funded by the Civil Protection Financial Instrument (2013-2015). Gathering operational investigations and scientific approaches is the aim of the ISDAMP+ project. The met-ocean prediction of coastal sea state allows performant oil-spill boom position to contain floating oil pollutant. The ISDAMP final conference permits a first presentation of these issues on oceanic hindcast and contingency planning modelling.

They will be addressed in the next ISDAMP communications of this day (11 march 2015), ocean operational modelling, numerical software as decision support system (DSS) and booming experimentations in harbours and estuaries (2 communications). The construction of local and international networks in sciences and oil-spill gives synergy with connected research works and permits to stay on the way of progress for preparedness and response to pollutions.

ISDAMP+ partners are EIGSI Engineering School La Rochelle and Casablanca (leader), IST Instituto Superior Técnico (University of Lisbon), Action-Modulers (Portugal) and Falmouth Harbour Commissioners (Cornwall, UK).

## Coastal sensitivity indices

*Paul Fattal, Université de Nantes, France*

The evaluation of coastal sensitivity in a high and efficient way is mandatory for National and Local authorities during maritime pollution disasters. Building efficient tools is a coherent integration of numerous spatio-temporal evaluations related to both socio-economic and environmental impacts of oil-spills.

The variation of such sensitivities in space and in time and their non-uniform repartition on the coastal zone need research works to adapt the existing evaluation tools and to share the best practices to the stakeholders. The coastal zone where *a priori* all sensitivities are supposed high for both ecological status and social dimension are particularly addressed for maritime and spatial policies improvement.

## Multibiomarker approach in the estuarine species under chronic and acute pollution conditions : a realistic measure of environmental quality of the Marina of La Rochelle

*Marine Breitwieser<sup>1</sup>, Denis Fichet<sup>1</sup>, Angélique Fontanaud<sup>2</sup>, Valérie Huet<sup>1</sup>, Carine Churlaud<sup>1</sup>, H Thomas-Guyon<sup>1</sup>*

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The evaluation of the impact of pollutants in the environment is at present one of major scientific topic. In a previous project, studies have aimed to observe the risks of chronic chemical contamination and consequence in the bivalve *Chlamys varia* in open coastal environment. In this context, the objective of new work will try to better understand the natural and anthropological phenomena which affect the functioning of a Marina of La Rochelle and its close environment: pollutions (hydrocarbons, heavy metals) which impact on the specific fauna but also on the neighboring zones and on the zones of relargage of the muds of dredging. Indeed, the harbour spaces constitute zones of interesting studies in terms of obvious environmental requirements on restricted surfaces. So, the biological effects of chemical pollution in the Marina of La Rochelle were looked for by developing an approach multi-biomarkers on specific marine species of this site and to consider the environmental variability (climatic & anthropic). In this context, animals were collected on diverse intra-harbour stations in order to (1) quantify the content of the inorganic contaminants in the marine bodies, and (2) realize the follow-up of indicators of feature to identify an indicator species such as bivalves (oysters & clams) of intra-harbour pollution. Moreover, it is important to stress efforts from department environment of La Rochelle Marina for the waste water treatment of fairing (filter with UV, filter coal and sand filter). These studies uses the platforms and technical site of LIENSs and will consider biochemical, physiological and/or genetic descriptors to animals. So, parameters of detoxification and enzymes of the oxidative stress were used as "alarm system" susceptible to detect a disturbance before the appearance of irreversible pathological signs. The obtained data was valued in association with the local actors (region concils) and in connection with the communications office of the Marina of La Rochelle. This holistic approach to environmental assessment is encouraged as it helps to identify the integrated impact of chemical contamination on organisms and to provide a realistic measure of environmental quality.

### **Falmouth Harbour Commissioners' pollution preparedness and training.**

*Duncan Paul, Falmouth Harbour Commissioners, Cornwall, UK*

Falmouth Harbour Commissioners (Cornwall, United Kingdom) is a Statutory harbour authority undertaking conservancy and pilotage functions and operating small marine leisure business. It has practical experience and expertise in oil pollution response and conducts ongoing preparedness training to improve response to future maritime pollution incidents. The Falmouth Port Commissioners have extensive expertise with regards to European Projects past and present. They are responsible for the *in situ* experiments portion of the ISDAMP project.

The MAIA experiment (May 2014) was carried out using a V-boom design moored in the Falmouth harbour waters. This innovative design consists of two wings of boom (~140 m long each) forming a giant V. An oil containment area was located at the base of this V, where a skimmer can be installed from a barge for oil pollution recovery. The Falmouth experimentation was a great success and the installation lasted 9 days (including nights with normal harbour traffic in the vicinity). This exercise served both as preparedness

training as well as to collect data to improve modelling systems developed in two European projects: SPRES and ISDAMP.

## Les attentes du juriste afin d'améliorer la réparation des pollutions marines par hydrocarbures

*Yann Rabuteau, Juriste, expert, Réseau ALLEGANS, Brest, France.*

Au même titre que les pollutions marines accidentelles par substances chimiques de type SNPD<sup>1</sup>, dans le cadre de la Convention dite « HNS <sup>2</sup>», les pollutions accidentelles par hydrocarbures transportées par des navires citernes font l'objet d'un régime international de responsabilité civile et d'indemnisation. Ce cadre international constitué des Conventions sur la responsabilité civile du propriétaire de navire citerne (Convention CLC 1969 / 1992), et des Conventions sur le Fonds international d'indemnisation pour les dommages dus aux pollutions par les hydrocarbures (Fipol 1971 / 1992 et Fonds complémentaire de 2003), a pour objet de garantir une indemnisation aux victimes des pollutions de type « marée noire », en dehors de toute action juridictionnelle, par l'intervention de l'assureur de responsabilité civile du propriétaire de navire et, le cas échéant, d'un fonds d'indemnisation dénommé Fipol.

Du point de vue de la réparation des dommages, la notion centrale est celle de « dommage par pollution » que les Conventions CLC de 1969 / 1992 définissent comme « *le préjudice ou le dommage causé à l'extérieur du navire par une contamination (...), étant entendu que les indemnités versées au titre de l'altération de l'environnement autres que le manque à gagner dû à cette altération seront limitées au coût des mesures raisonnables de remise en état qui ont été effectivement prises ou qui le seront* » ainsi que « *le coût des mesures de sauvegarde et les autres préjudices ou dommages causés par ces mesures* ». Or, ces conventions ne précisent pas davantage les catégories de dommages recevables, ni les modes de preuves des préjudices en cause ou encore les méthodes d'évaluation à utiliser. Le système étant amiable, la preuve du dommage est libre. Si la pratique de l'indemnisation des marées noires permet de préciser les contours des préjudices recevables (matériels, économiques, atteintes à l'environnement), et les critères utilisés (coûts, raisonnable...) les mêmes obstacles se révèlent également au gré des affaires : la connaissance et l'accès aux données utiles à la preuve du dommage, à la caractérisation du préjudice et à son évaluation sont souvent des difficultés réelles pour les demandeurs. Ces données utiles peuvent être de nature économique (secteurs de la pêche, des cultures marines, du tourisme...) ou environnementale (biodiversité, état initial d'un site, d'un habitat, faune, flore...), ou encore attachées aux usages et à la destination d'une zone (activités récréatives, conservation, valorisation...). Autant de données dont la connaissance avant la crise et la représentation vont servir la définition du préjudice et l'évaluation des dommages, pour une juste réparation ou une compensation des atteintes portées au milieu.

Cette contribution a pour objet de préciser les attentes du juriste à cet égard et en fonction des caractéristiques du système CLC /Fipol et des critères de recevabilité utilisés par les experts, mais également en fonction des jurisprudences pertinentes en matière de pollutions marines, en cas de contentieux. Par

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<sup>1</sup> SNPD : Substances Nuisibles et Potentiellement Dangereuses.

<sup>2</sup> Hazardous and Noxious Substances by Sea Convention (1996).

exemple, les technologies web, la géomatique, les données économiques, la connaissance des milieux côtiers ou la caractérisation des effets du polluant, peuvent être d'un grand secours pour optimiser la réparation d'un dommage par pollution. Les questions de preuve, de caractérisation du préjudice et d'évaluation des dommages s'en trouvent ainsi facilitées sur des bases objectives. L'auteur propose de procéder à un inventaire de ces besoins de données et de représentations utiles à l'indemnisation des pollutions marines par hydrocarbures en s'appuyant sur la pratique et la référence à des affaires marquantes (« Erika », « Prestige », notamment).

### **A software framework to improve preparedness and response activities to marine pollution incidents.**

*Frank Braunschweig, Action Modulers, Mafra, Portugal*

Within the ISDAMP+ project a set of technologies have been developed which improves the preparedness and response activities to marine pollution incidents. These technologies include a new integrated numerical simulation model, which combines a hydrodynamic model with a barrier model, an operational data server and graphical user interfaces to manage and explore the system.

The presentation will show: (i) examples of the application of the integrated model, showing how this integrated model can be used to simulate the interdependent processes of hydrodynamics, barrier movement and oil interception, (ii) the general software architecture implemented within the project and (iii) examples of how these technologies can be used from an user point of view during marine pollution incidents.

### **Using high resolution metocean forecasting systems to improve preparedness and response activities to marine pollution incidents.**

*Fernandes, Rodrigo; Viegas, Cláudia; Ascione, Isabella; Pinto, Lígia; de Pablo, Hilda; Sobrinho, João; Franz, Guilherme, Instituto Superior Técnico, Lisbon, Portugal*

Metocean forecasting systems are widespread over the world, with results being used for several different purposes, including research and recreational activities, renewable energies, aquaculture, water quality monitoring, etc. These systems are obviously essential in maritime safety and pollution management as well. However, when preparedness and response activities to marine pollution are needed in the near-shore, the availability of high spatial and time resolution forecasts becomes critical. Low resolution forecasting systems (e.g. available forecasts from MyOCEAN, NOAA, windguru, etc.) can compromise the reliability of the operations. Examples will illustrate how important is to have high resolution models in the mentioned applications.

The implemented high resolution metocean models in Lisbon and La Rochelle will be described in this presentation. The application of these modelling systems prior and during to ISDAMP exercise in Lisbon will be detailed, showing that they can be extremely useful when planning field work.



Preparedness exercises can also significantly contribute to improve metocean models reliability. Examples will be shown from different exercises previously performed.

### **Booming strategies in small harbours: From modeling to real life tests**

*Thomas Ternisien and Rose Campbell, EIGSI, La Rochelle, France*

Containment and absorbent booms are used as a first emergency response to oil spill to protect specific areas onshore or contain oil spill around boats. An appropriate response and positioning of floating booms may be complex to suggest due to the difficulties of forecasting the diffusion of the oil spill due to several meteorological and local parameters and due to the singularity of each oil accident. On another scale, small commercial or fishing harbours are often subjected to oil spills occurring when the harbor is used as a shelter for salvage operations or caused by maintenance accidents, reservoir leakage... These small harbours are convenient locations to control oil containment operations and to develop appropriate solutions for boom deployment.

Small harbours also represent an opportunity to develop data acquisition protocols using a scientifically controlled approach and allowing fundamental comparisons between experiments and forecasting tools. In this context, EIGSI has operated an experiment in the commercial port of Rochefort with a 50-meter containment boom subjected to a sweeping operation in between a quay and a towing boat. Using simple technology, the instantaneous structural deformation of the boom as well as the instantaneous tension exerted on the mooring cable were captured during the operation. Data were then compared to the output of the model developed by the EIGSI simulation code. We propose here to present the results obtained.

