

## About

This JPI Oceans action on munition in the sea was first proposed by the Strategic Advisory Board in April 2014, then addressed by the Management board in April 2015 and finally approved in November 2015. The aim of the action is to assess risks, define priorities and suggest intervention options with regards to munition in the marine environment. The outcomes of the action will be used to support identification, monitoring and elimination of threats through a more systematic approach.

## Objectives

As a result of discussions between the most relevant stakeholders, it has been decided that JPI Oceans will conduct activities along three lines:

**Science Support** – By combining different scientific disciplines, JPI Oceans intends to support the development of a service to forecast changes in the sea state in relation to munitions. Simulation of the impact of removal, dispersion and detonation on human health, on the environment, and on economic activities will also be investigated.

**Technology Transfer** – JPI Oceans will analyse different technologies and procedures for intervention to support decisions by operators and policy makers. The development demonstration of technologies and procedures can be used to increase safety, improve the efficacy and reduce the environmental impacts of interventions. JPI Oceans will provide support to exchange findings between different disciplines, projects and initiatives.

**Exchange of Knowledge** – Panels of experts will support transfer of knowledge and experiences of dealing with munitions in the sea.

## Background

Large quantities of conventional and chemical weapons have been dumped in European seas throughout the 20th century, particularly in the aftermath of the first and second world wars as well as of the recent conflicts in the Balkan area. The problem of dumped munitions is understood within the European region, but they are not currently seen as a high priority for scientific research. Being a sensitive subject, it is sometimes difficult to coordinate activities internationally and across scientific disciplines.

Munitions in the sea pose a number of risks to human safety and wellbeing, environmental integrity and economic activity. Research into the effects of conventional and chemical weapons has shown the negative impacts on marine life, which in turn has implications for human health. Over time, the degradation of shell casings and containers leads to instability in dumped munitions. Coupled with the intensification of the use of marine space for economic and social activities inevitably increases the likelihood of harm. A coordinated transnational response could increase the efficiency and effectiveness of interventions by sharing experience and skills across Europe.

 BELGIUM

Federal Public Planning Service Science Policy (BELSPO)

 GERMANY

Research Centre Juelich (JÜLICH)

 SPAIN

Spanish Ministry of Economy and Competitiveness (MINECO)

 UNITED KINGDOM

Department for Environment Food & Rural Affairs (DEFRA)  
National Oceanography Centre (SOTON-NOCS)  
Natural Environment Research Council (NERC)

 GREECE

Hellenic Centre for Marine Research (HCMR)  
Ministry of Development; General Secretariat for Research and Technology (GSRT)

 IRELAND

Marine Institute Ireland (MI)

 ITALY

National Research Council (CNR)

 NETHERLANDS

Netherlands Organisation for Scientific Research (NWO)  
Ministry of Economic Affairs, Agriculture and Innovation (EL&I)  
Netherlands Organisation for Scientific Research (NWO)

 NORWAY

Research Council of Norway (RCN)  
Norwegian Defence Research Establishment (FFI)

 POLAND

Polish Academy of Sciences; Institute of Hydroengineering (IBW PAN)

 PORTUGAL

University of Porto

 SWEDEN

Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS)  
Swedish Agency for Marine and Water Management (HaV)

# Scientific support to Munition in the sea

The workshop addresses scientific gaps and how research can bring substantial contributions for solutions and advances in knowledge

CNR-INM  
National Research Council of Italy  
Institute of Marine Engineering  
*Via di Vallerano, 139, 00128 Rome*

**December 6-7, 2018**



# Terms of reference

## Background

Ammunition dumped at sea during or after wars constitutes an environmental and safety issue in many European countries. Chemical and conventional ammunition from world war I and II are corroding and the risks of spontaneous detonations or leakage of toxic compounds are increasing. The whereabouts and condition of the dumped munition is still unknown. At the same time, there is increasing pressure to use coastal areas for recreational, residential and industrial purposes. This leads to increasing challenges with societal and environmental risks.

JPI Oceans has initiated a joint action on “munition in the sea” to facilitate research coordination and exchange of knowledge across European countries. As part of this initiative we are organising the second of two workshops planned for 2018, with the financial contribution of CSA Oceans 2, to bring together researchers, regulators/authorities, industry, and operational EOD-operators to discuss the scientific support to the challenge.

## Workshop objectives

A workshop to exchange practices and identify research gaps has been held in Oslo in June 2018. Despite that workshop was framed within the scenario of tackling the challenges of unexploded ordnances in areas where pipelines and cables are planned to be installed, the outputs can be considered more general for the aspects of risk assessments, remediation options and spatial planning.

This workshop in Rome will address some major aspects where research can bring substantial contributions for solutions or advances in knowledge.

## Workshop organisers

The workshop is organized by the National Research Council of Italy. Points of contact are:  
Cecilia Leotardi ([cecilia.leotardi@cnr.it](mailto:cecilia.leotardi@cnr.it)),  
Enrico De Bernardis ([enrico.debernardis@cnr.it](mailto:enrico.debernardis@cnr.it)).

## Workshop dates and venue

The workshop will be held at the CNR Institute of Marine Engineering (INM, <https://www.cnr.it/en/institute/118>) headquarters, in Rome, via di Vallerano 139, on December 6-7, 2018.

## Workshop structure

The workshop will address four main aspects:

- Knowledge-based support to decisions
- Large scale identification of objects
- Chemicals sensing and remediation
- Cost efficient explosions' remediation

The first day there will be few keynote speeches and four parallel sessions for debating how available scientific results or advances in knowledge can impact on solutions. A session in the second day between experts and representatives of the JPI Oceans management board is foreseen to elaborate on future steps.



# Workshop Programme

## First Day (09:30 – 17:30)

09:00-09:30 Registration of the participants

### 09:30-10:30 Opening

Welcome (Daniele Ranocchia, CNR-INM Acting Director)

#### Munition in the Sea in a nutshell

Emilio F. Campana, JPI Oceans MB, CNR, Italy

#### Rationale and aims of the workshop

Pier Francesco Moretti, JPI Oceans Secretariat, CNR, Italy

10:30-10:45 Coffee break

### 10:45-13:00 Keynotes

#### Support to decisions: the agent-based modeling

Amedeo Cesta, CNR-ISTC, Rome, Italy

#### Chemicals sensing and remediation: the state of the art

Claus Böttcher, Ministry of EAEND, Kiel, Germany

#### Explosions' remediation: accounting for cost efficiency and nature conservation needs

Sven Koschinski, Meereszoologie, Nehnten, Germany

#### Classification of objects: algorithms from other sectors and relevant information for artificial intelligence

Kristine Bauer, Fraunhofer IGD, Rostock, Germany

13:00-14:00 Light lunch

14:00-17:00 **Parallel sessions:** planning of interventions, chemical remediation, explosions' remediation, classification via autonomous vehicles

Discussion between experts and draft proposals for action

## Second Day (09:30 – 13:00)

09:30-13:00 **Support to policy and knowledge-based solutions**

Report from the four parallel sessions

#### The cross-cutting issues with MSFD and MSP

Maurizio Ribera d'Alcalà, SZ Anton Dohrn, Naples, Italy

11:00-11:30 Coffee break

#### Feedbacks from the Management Board

Emilio F. Campana

Open Discussion (Moderators: E. F. Campana, P. F. Moretti)

Workshop wrap-up (Pier Francesco Moretti)

13:00-14:00 Light lunch

### Optional (14:00 – 15:30)

14:00-15:30 **Tour to INM Facilities and Labs**