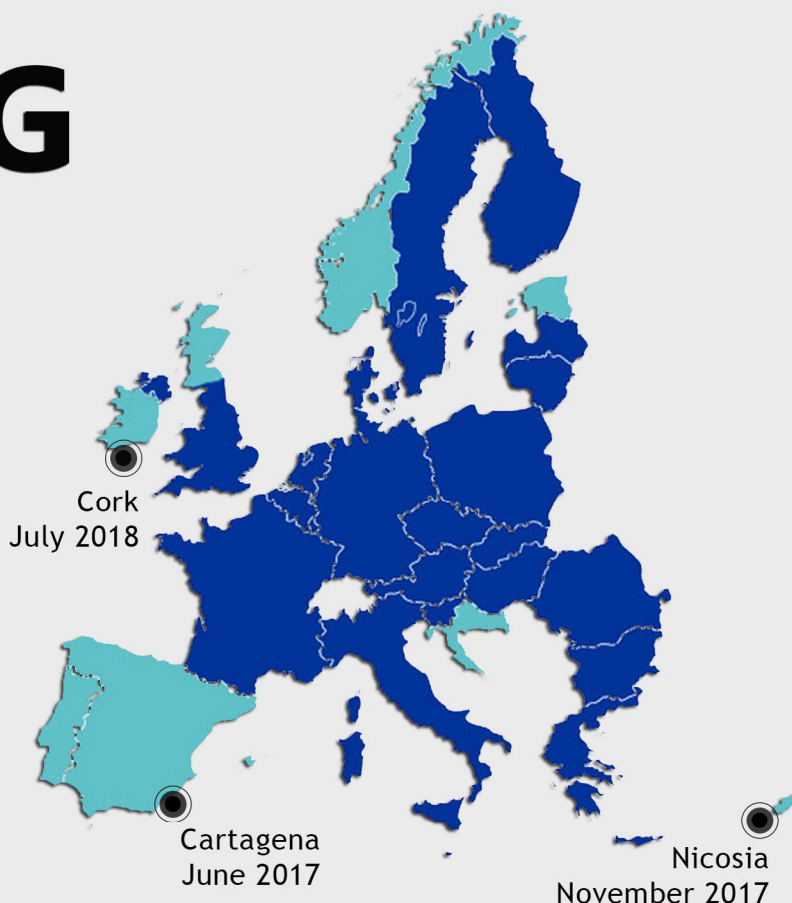




TRAINING COURSE

Three practical/theoretical courses have been performed for transferring the know-how gained during the e-URready4OS project to Maritime Safety Agencies.



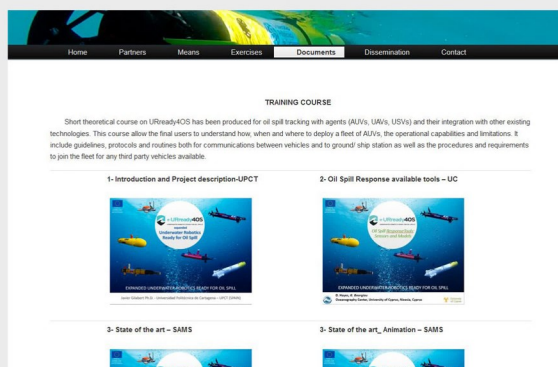
AVAILABLE ON-LINE

<http://www.upct.es/urready4os>

White Paper



Course Presentations



Training Exercises



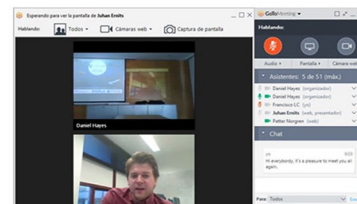
TRAINING COURSE FOR MARITIME SAFETY AGENCIES



Short theoretical course on URready4OS has been produced for oil spill tracking with agents (AUVs, UAVs, USVs) and their integration with other existing technologies. This course allows the final users to understand how, when and where to deploy a fleet of AUVs, the operational capabilities and limitations. It includes guidelines, protocols and routines for communications between vehicles and to ground/ship station as well as procedures and requirements to join the fleet for any third party vehicles available.

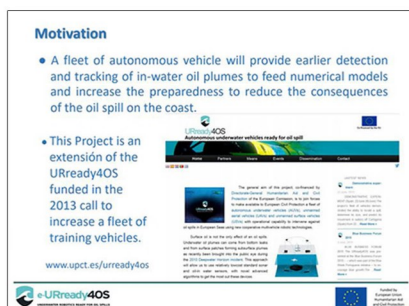
The document - or project white paper - produced is focused on practical issues rather than theoretical so it can be used for final users to decide when and how they should use these technologies, how to download and install the software, how to prepare new vehicles to join the fleet, which are the communications requirements for aerial and underwater, communications protocols to use, etc.

The web page of the project (<http://www.upct.es/urready4os>) has been updated with downloadable developed material.



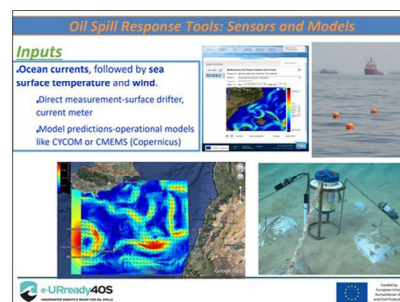
COURSE CHAPTERS

Introduction and Project description



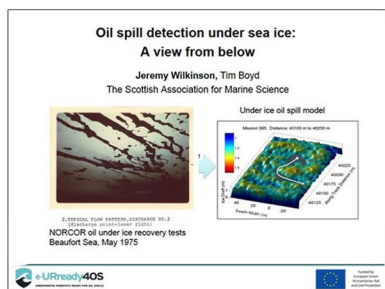
A short description of the project is provided: aims, partners, actions, activities, implementation process, etc. The project achievements are introduced together with an outline of the course topics.

Oil Spill Response available tools



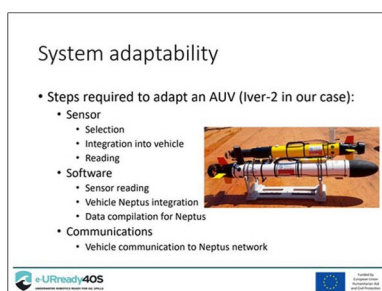
The fate of in water spilled oil is usually tracked by adaptive Lagrangian models such as MEDLISK, designed to be used to predict the transport and weathering of an oil spill. A part from models as key tool to trace oil fate, this chapter includes description of sensors for in water oil detection.

State of the art



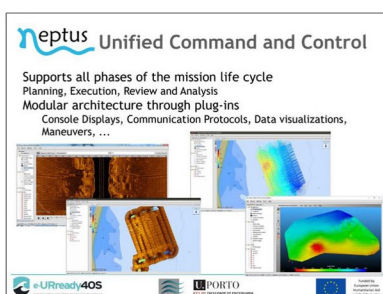
A summary of recently-available technologies and sensors for in situ measurement is given with emphasis on Autonomous Underwater Vehicles as tools for in water oil spill response.

System adaptability



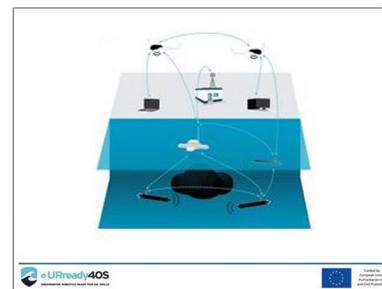
The system, as designed, can be scaled up - to include numerous vehicles in order to scan large areas - or scaled down - to a single vehicle for small slicks - being cost effective. AUV's support extends the range of AUV operations. Solutions for different types of probes integration are also shown.

Neptus Command and Control



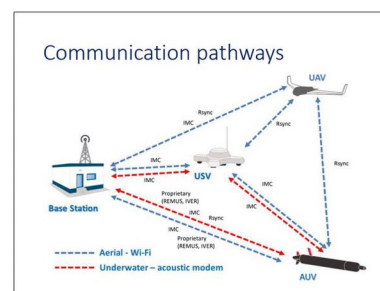
The Command and Control console NEPTUS is the central piece of software coordinating the fleet. It can plan and execute mission for any kind of vehicles. Compatibility with most of the vehicles used during the project have been implemented in the project. A description of the software and its functionalities is provided in this talk.

System description



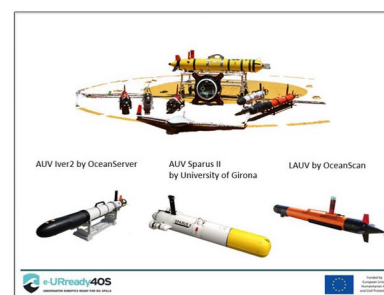
A comprehensive description of the system is performed comprising the diverse kinds of underwater, surface and aerial vehicles. Vehicles technical specifications are also provided together with advantages of using this technology.

Communications between agents



The URready4Os system involves four types of agents: Operators, AUVs, UAVs and USVs. Communications are the key for the system coordination success. Two factors must be considered in the communication process: pathways and protocols. This talk describes both in order to approach the inner part of the system coordination.

Integration of different AUVs in NEPTUS



Several vehicles from different manufacturers with different operative systems have been integrated into Neptus for real time operations. Here, a description of different integrations is provided together with an outline of steps required to adapt the AUV's software.



The attendees say....



Laura de la Torre

**SPANISH MARITIME SAFETY & RESCUE AGENCY
HEAD OF THE ENVIRONMENT & QUALITY UNIT**

The latest larger incident pollutions in Spain have included oil releases from wrecks, requiring underwater response operations (Prestige 2002, Don Pedro 2007, Oleg Naydenov 2015). The Spanish Maritime Safety & Rescue Agency supports the system created under this project. A way forward to monitor subaquatic oil releases can be the e-URready4OS autonomous vehicle fleet based on the latest communication technologies. More research must still go on to keep improving, but it is a fact that e-Rready4OS offers maritime pollution responders a new approach to face underwater spills.



Dave McMyler

**IRISH COAST GUARD
DEPARTMENT OF TRANSPORT, TOURISM AND SPORT**

This is innovative research. It is a necessary and, I daresay, an obvious development to assist responders in their response to a spill. In time, following further development, I think it will play as an important part in the management of an oil spill as aerial surveillance does presently.

James Pringle

**SENIOR RESPONSE SPECIALIST
OIL SPILL RESPONSE LTD**

A great example of collaboration to achieve a common goal focussed around the application of AUV for oil spill preparedness and response.

Argyri Elia

CYPRUS CIVIL DEFENCE

A great educational theoretical experience targeted, fully prepared and informative around oil spill preparedness and response and the application of AUV. Honored to meet you all.

