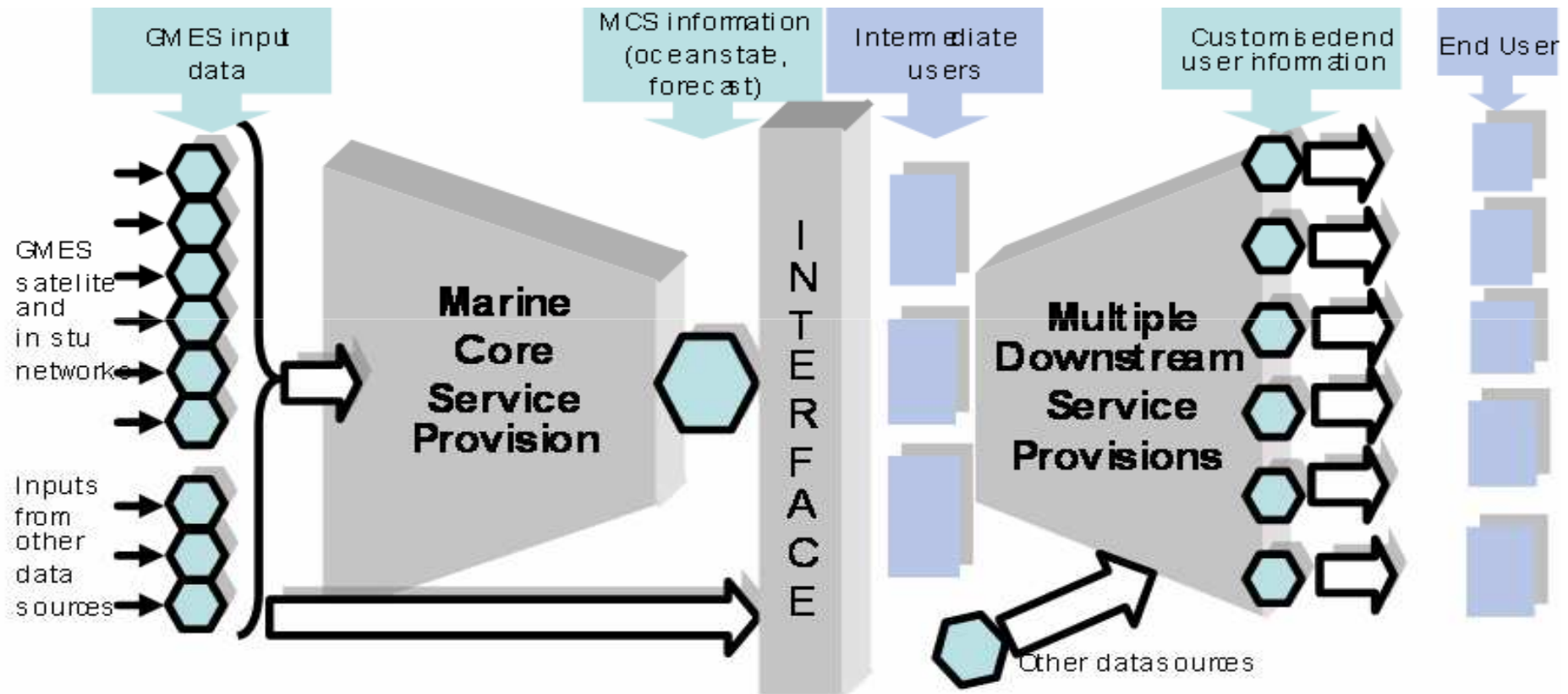


Mediterranean Operational Oceanography Network (MOON) in support of oil spill emergencies management.

Giovanni Coppini, M. De Dominicis and N. Pinardi
Italian National Group of Operational Oceanography
INGV, Bologna

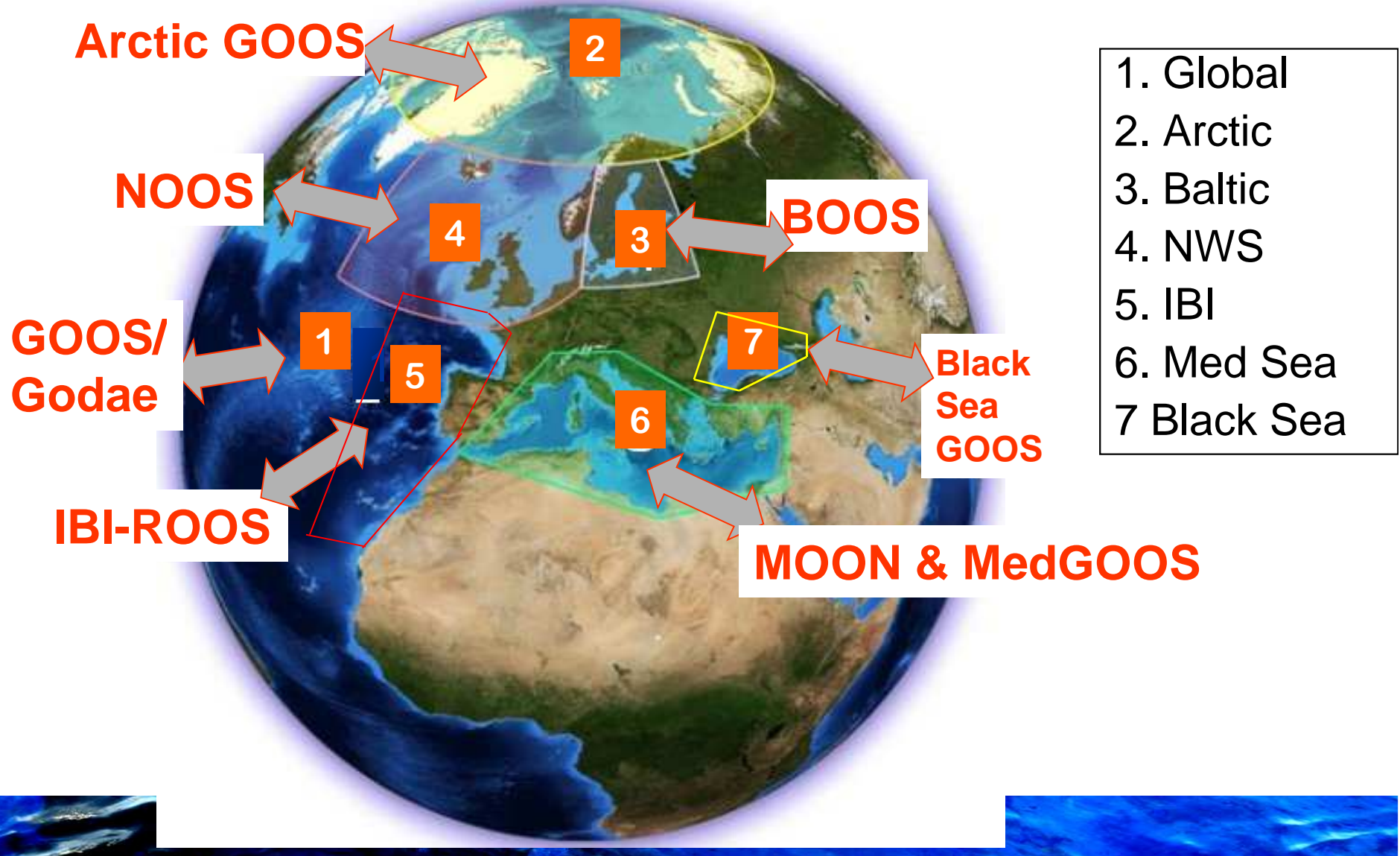


The European Marine “core” service and the relationship with downstream services

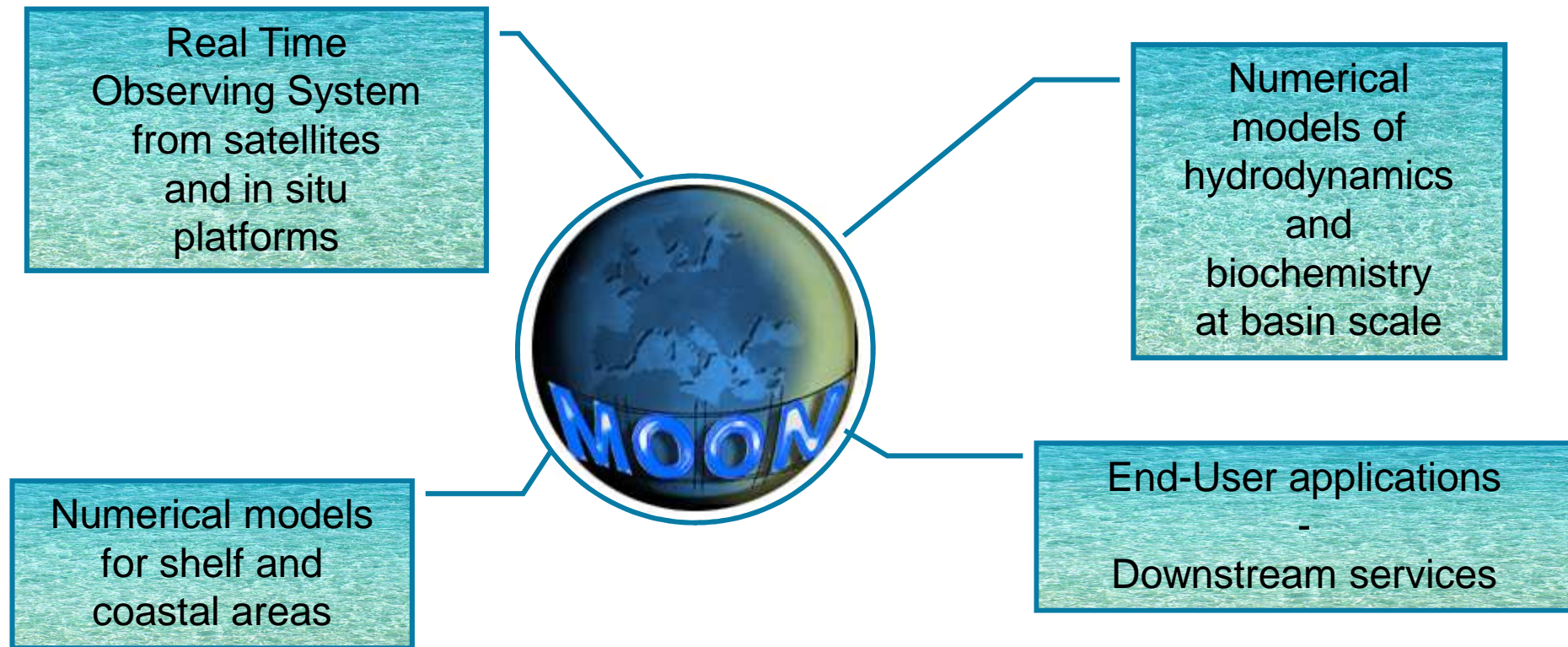


From GMES MCS Implementation Group report by P.Ryder & al

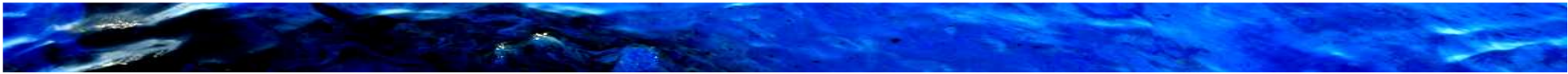
The MyOcean System: uniform technology, pan-European quality standards



Operational oceanography in the Mediterranean Sea: 1995-today

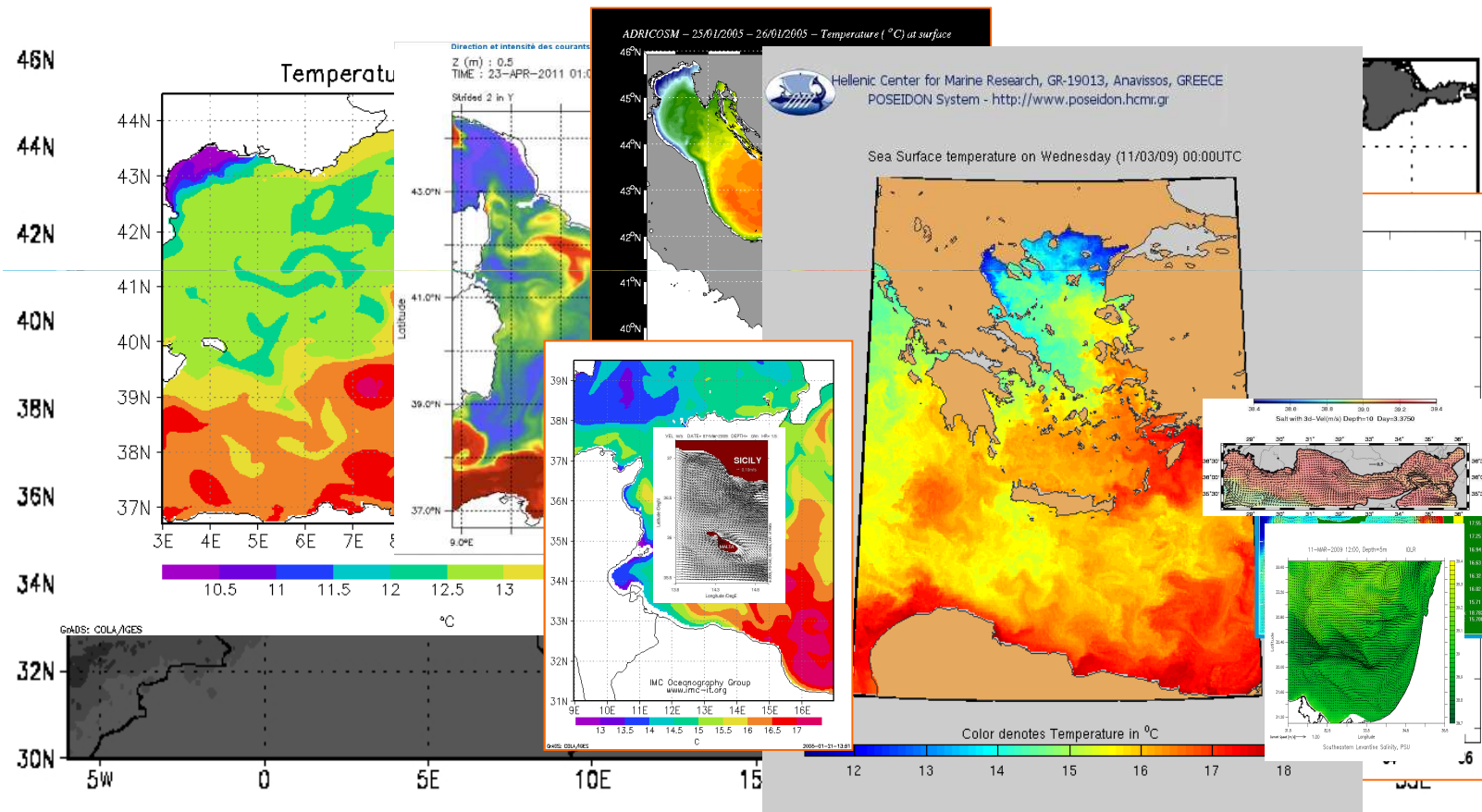


MOON: Mediterranean Operational Oceanography Network
16 nations involved, 36 institutions. www.moon-oceanforecasting.eu



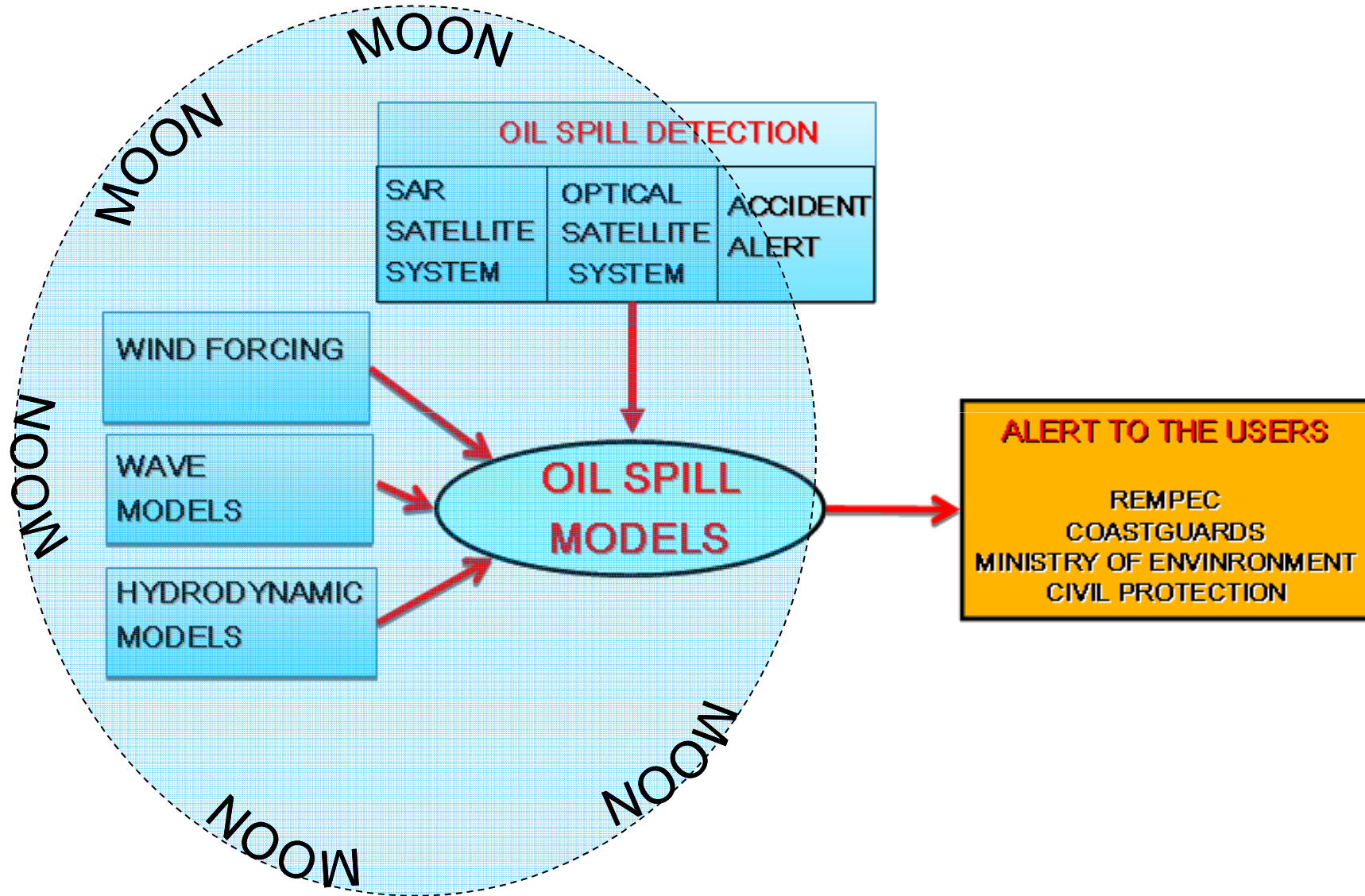
MOON Ocean Forecasting Systems

MFS-MyOcean (INGV) disseminates daily forecasts to 13 nested models every day

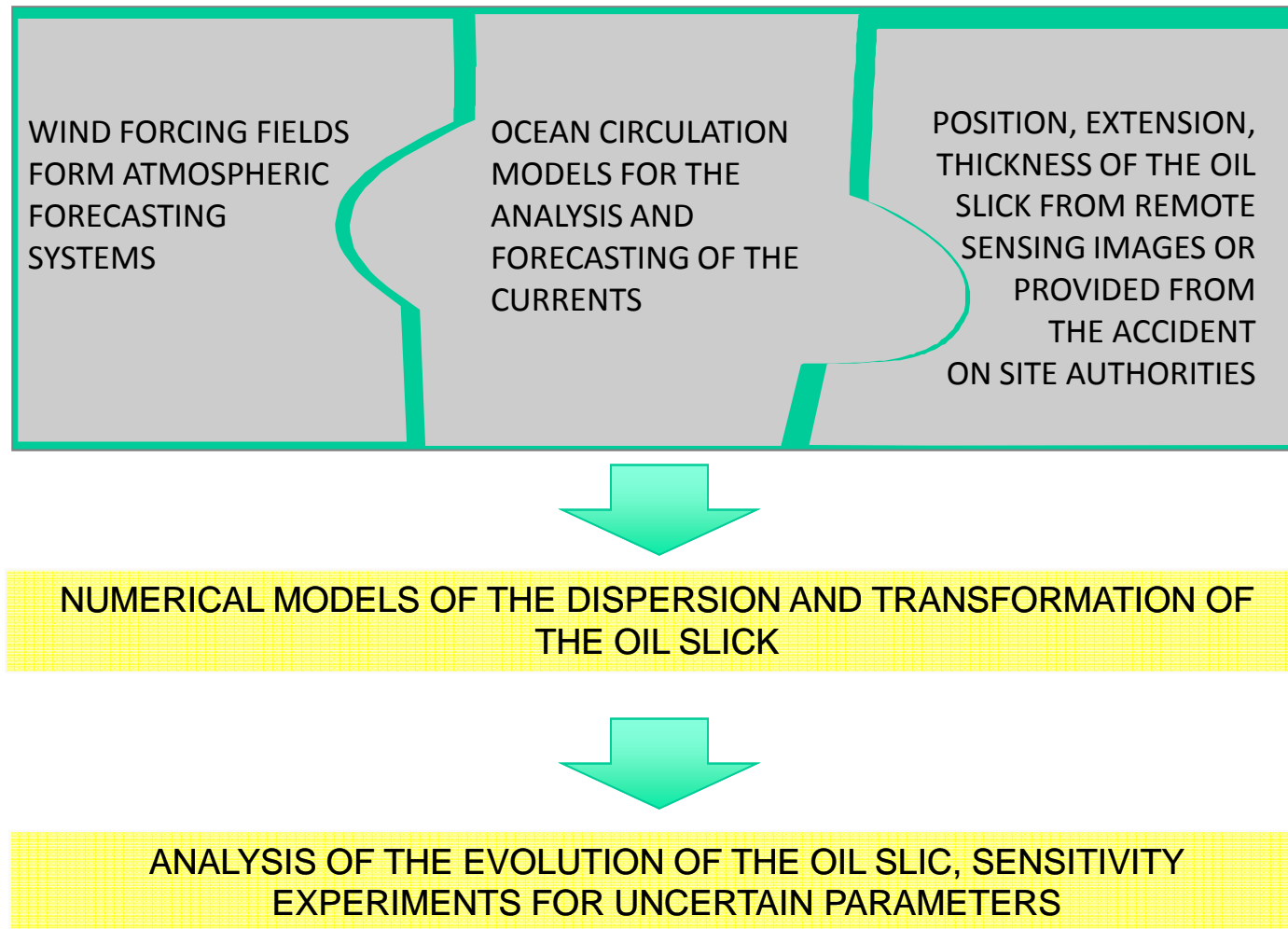


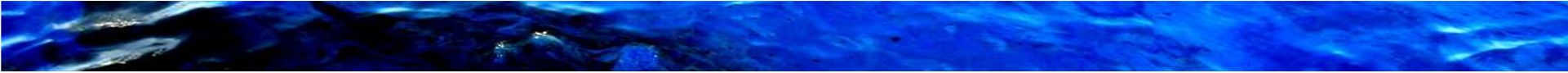
Shelf and sub-regional models now reach 1 - 3 km resolution

Integrated Oil Spill detection and Forecasting System



Functional schema of the forecasting system

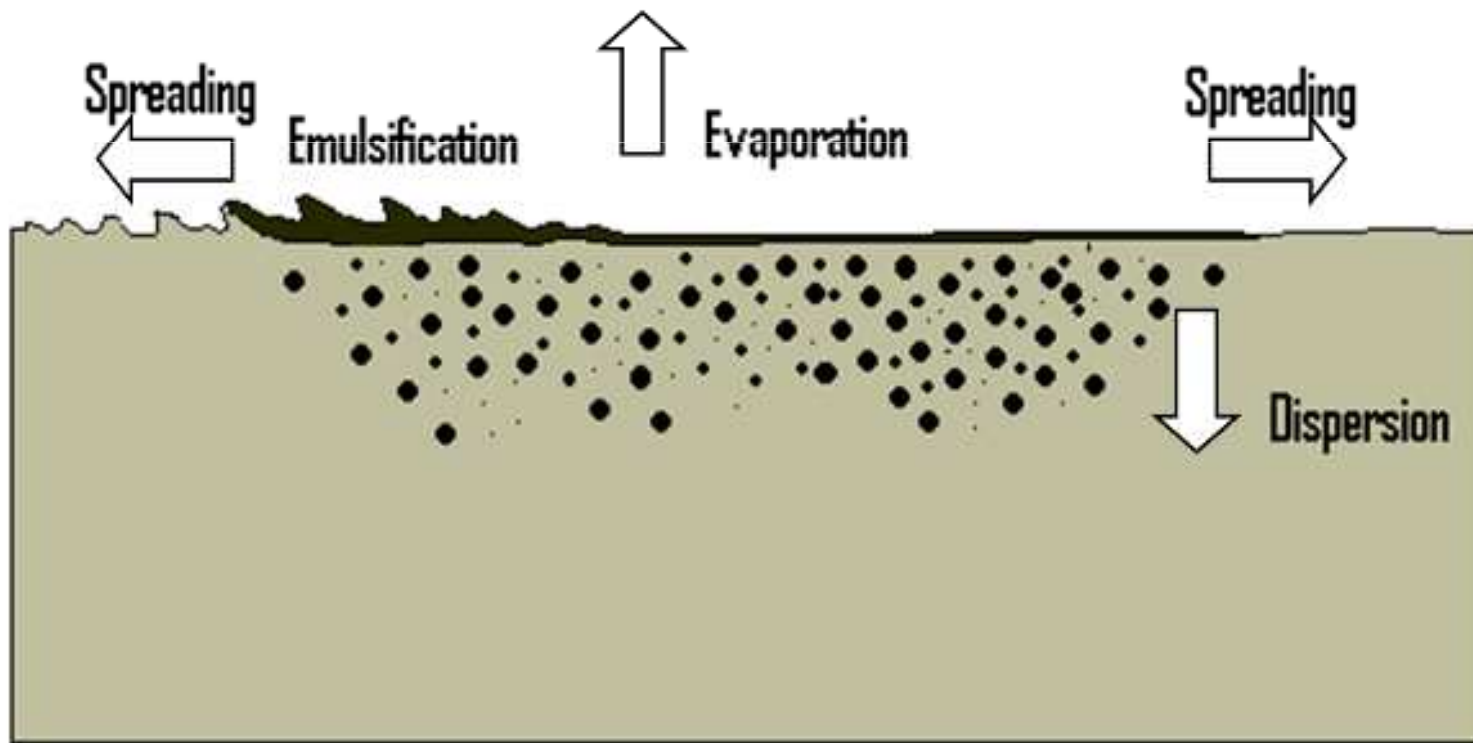




Oil spill forecasting model: processes
Medslick-II (Dedominicis et al., 2011)

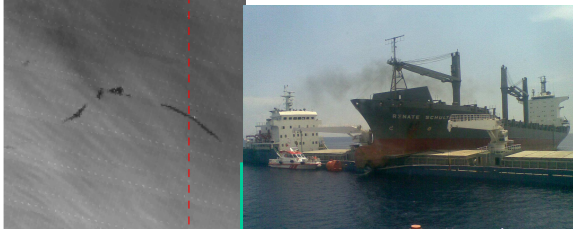
Transport by Lagrangian advection and diffusion

+



MOON-Emergency Response Office (ERO): operational support to REMPEC

Local Authorities



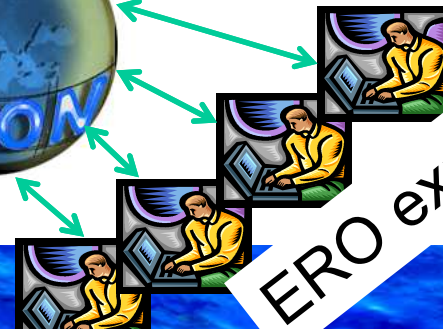
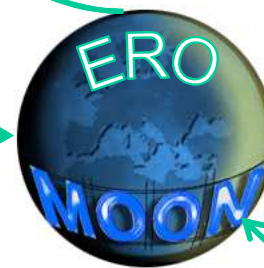
Emergency call
Local Authorities



Provision to Local Authorities of ERO
bulletins

Provision to REMPEC of ERO
bulletins with oil spill forecast and
images and meteo-
oceanographics products

Emergency call to
ERO manager and
provision of info

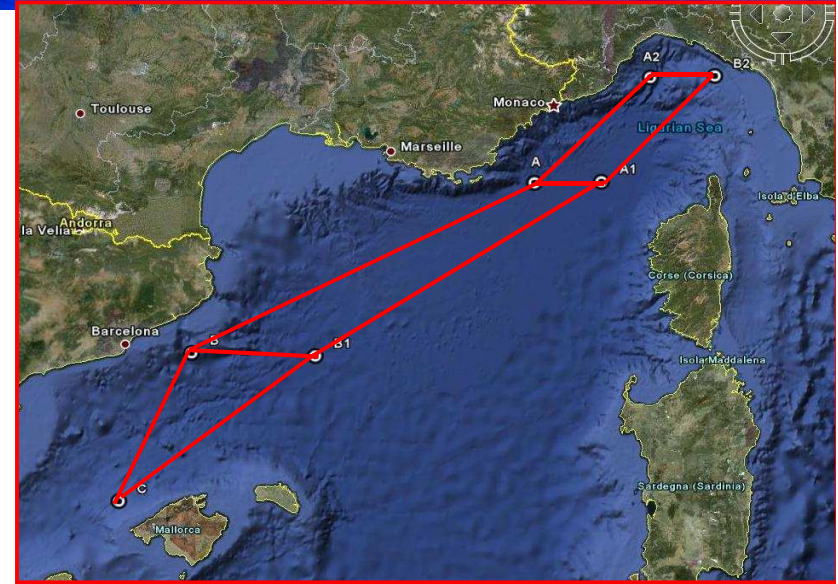


ERO experts



The support of MOON to OSCAR-MED REMPEC operation

- Daily meteoceanographic bulletins: Surface currents, Sea Surface Temperature (SST), Wind at 10 m, Waves height and direction;
- Oil spill drifting forecasts of the slicks detected by satellite and by aircraft;
- Provision of complementary (to CSN) optical images for oil spill detection.

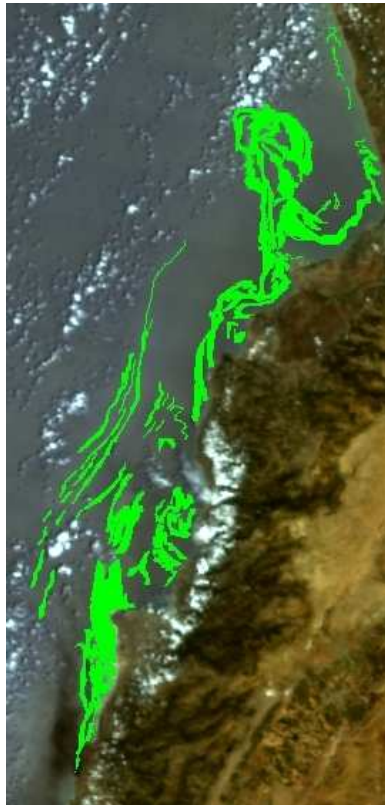


MOON-ERO and GNOO support in Emergency: special cases

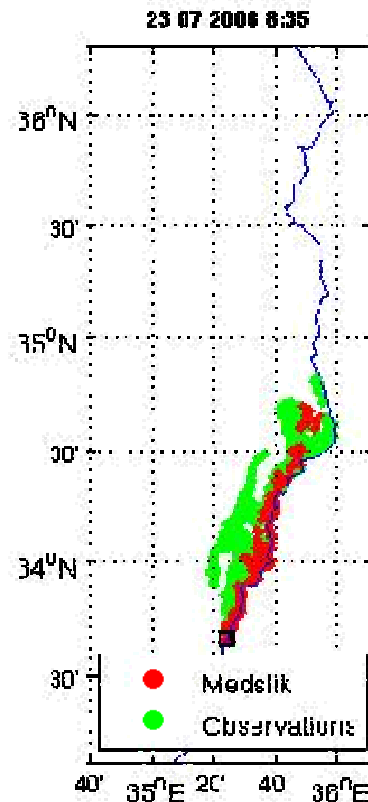
- Lebanon accident (July-August 2006, Lebanon)
- Gibraltar accident (05/09/2007, Spain)
- Und Adryatik accident (06/02/2008, Croatia, Slovenia and Italy)
- Renate-Shulte Aegean Sea accident (June-July 2009, Greece and Turkey)
- FURNESS MELBOURNE case (6 January 2010, Morocco)
- Po river Emergency (February 2010, Italy)
- Porto Torres emergency (January 2011, Italy)
- Several Oil slicks detected from satellite images



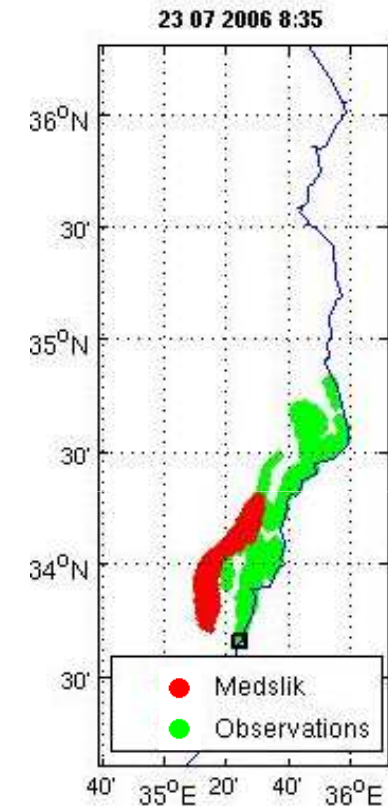
Lebanon Accident (July-August 2006)



MODIS-ACQUA image, 23 July: (08:35 GMT): oil (green) is already in Tripoli.



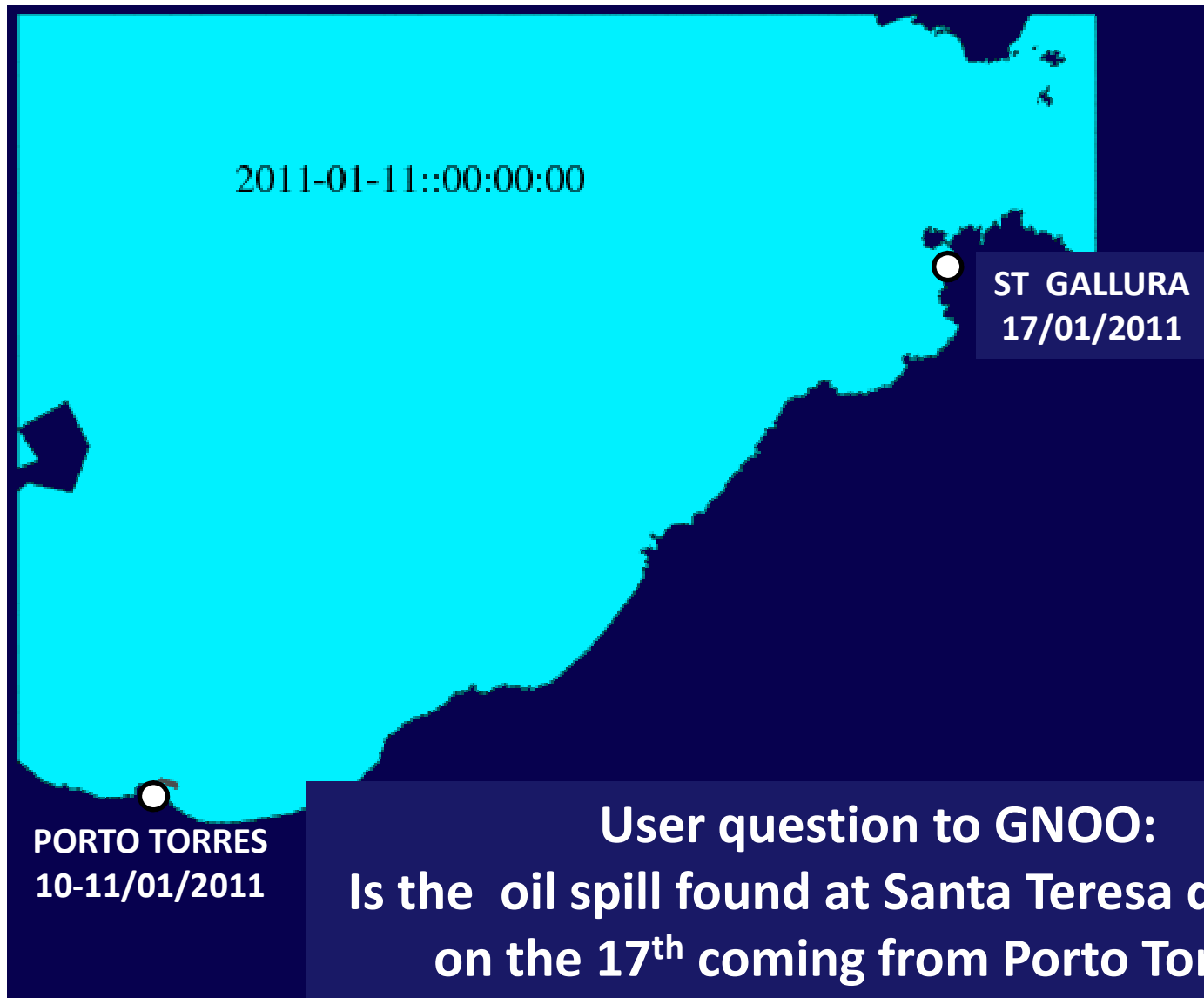
Oil position predicted by CYCOFOS-MEDLSIK (red), 23 July 9:00 GMT (after 241 hours) compared with the slick observed by MODIS (green)



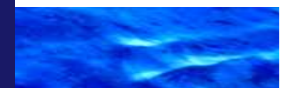
Oil position predicted by MFS-MEDSLIK (red), 23 July 9:00 GMT (after 241 hours) compared with the slick observed by MODIS (green)



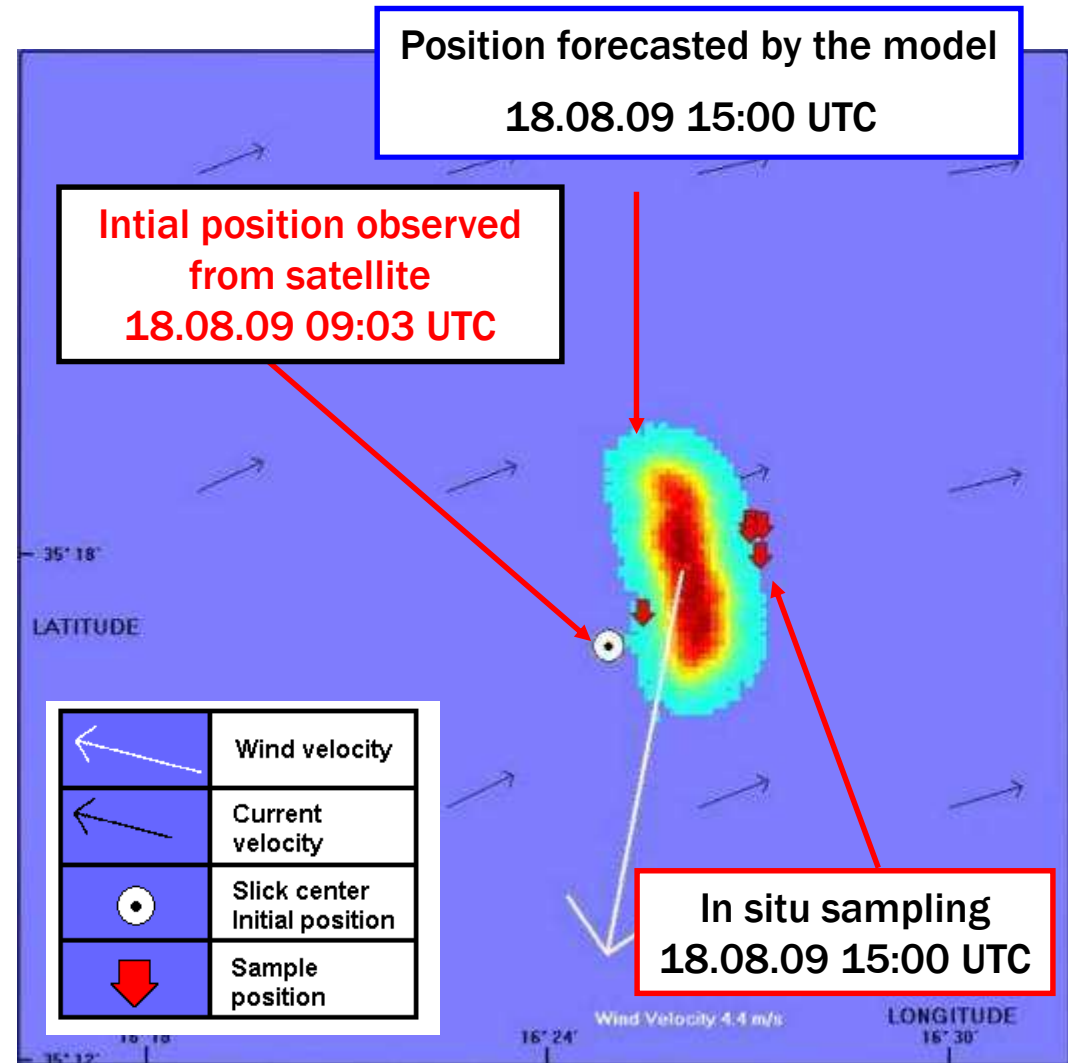
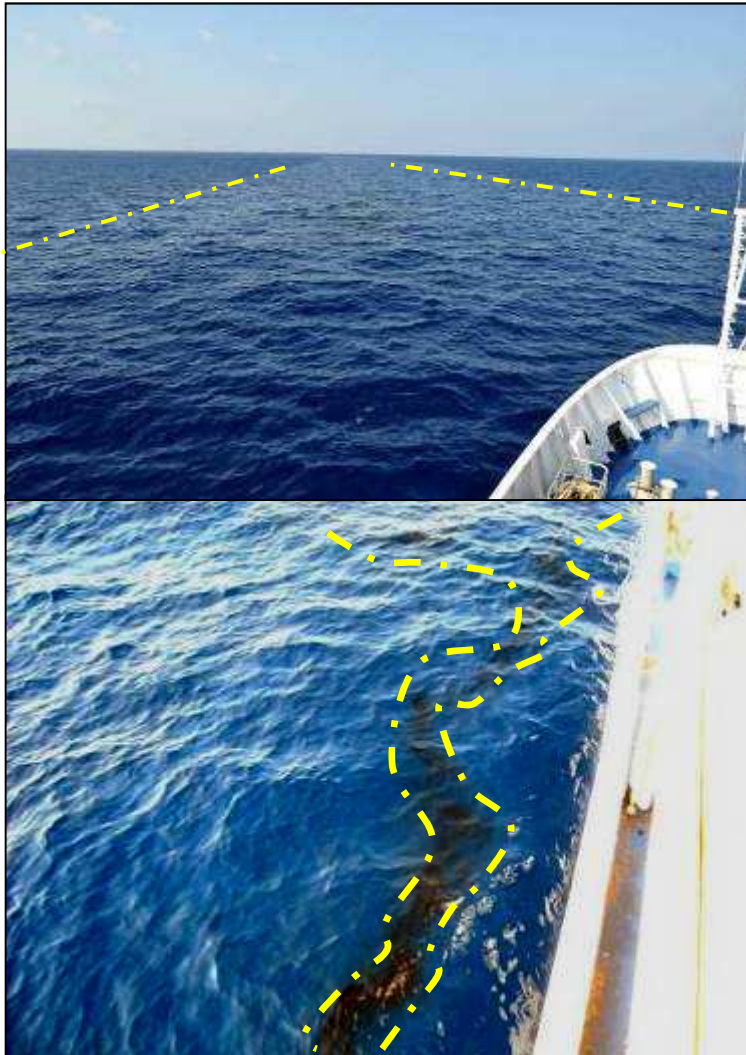
Porto Torres emergency CNR-IAMC (GNOO) support to Italian Coast Guard



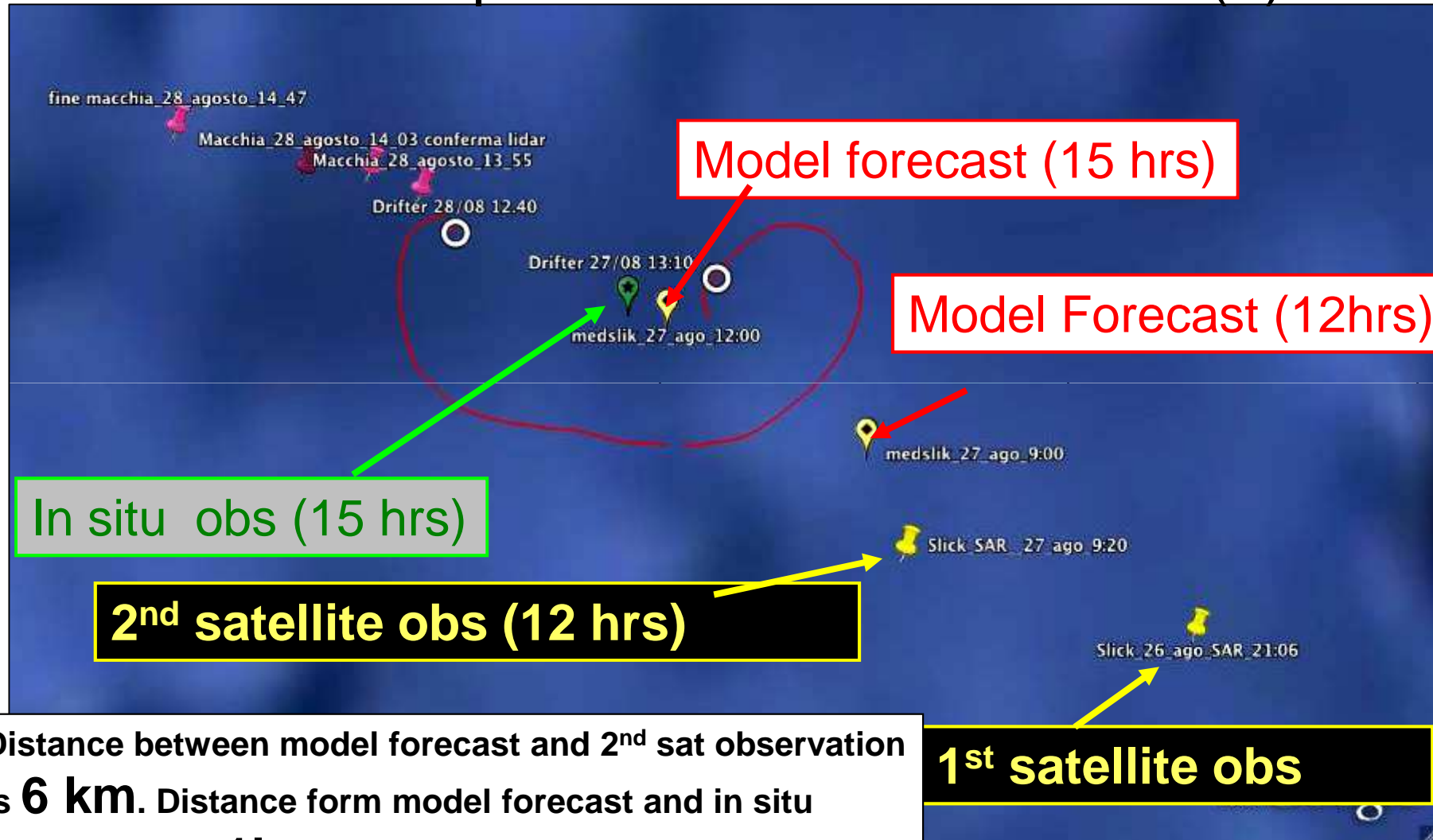
GNOO and Italian Coast Guard are cooperating in the filed of oil spill forecasting (Memorandum of Agreement signed in 2010)



Sea experiments: forecasting system allows to find the oil spill detected from satellite (2)



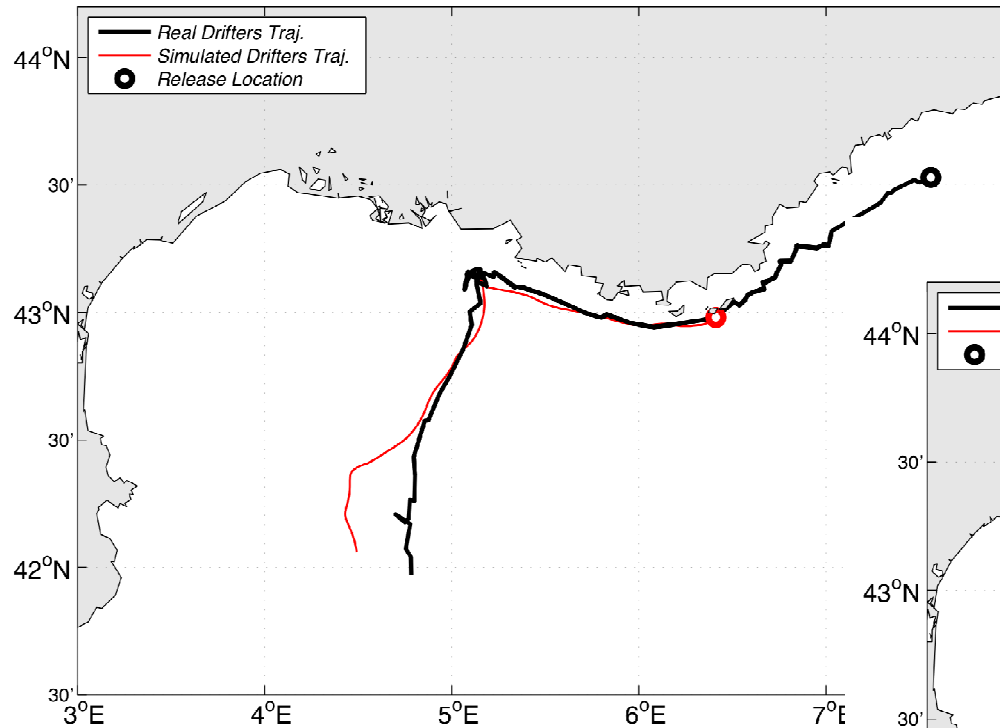
Sea experiments: forecasting system allows to find the oil spill detected from satellite (4)



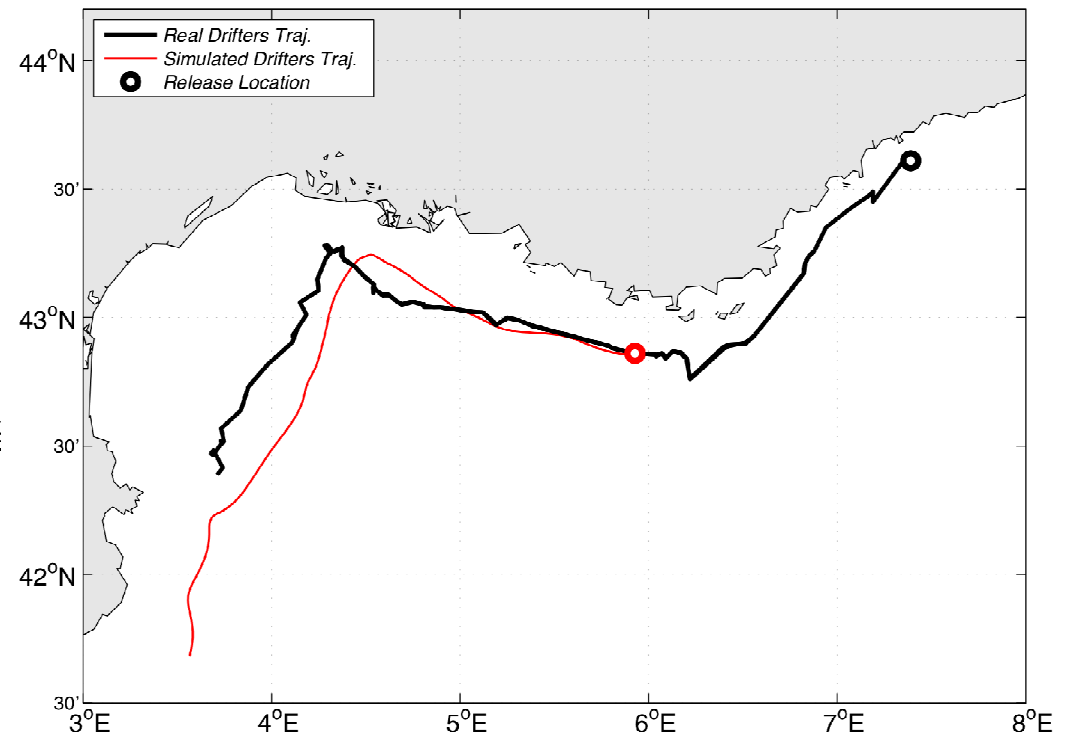
Distance between model forecast and 2nd sat observation is **6 km**. Distance form model forecast and in situ observation is **1km**.

MERSEA drifter experiment: forecasting system is capable to predict the drifter trajectories

Drifter 75661 14/10/2007 – 22/10/2007



Drifter 60212 14/10/2007 – 22/10/2007





Conclusions

- MOON has developed an integrated system for operational monitoring and forecasting of oil slicks in the Mediterranean Sea, built upon the use of different satellite platforms and the operational ocean forecasting systems;
- MOON and GNOO oil spill detection and forecasting system have been validated demonstrating that without an accurate forecasting system is not possible to locate oil spills after initial detection and therefore manage oil spill crises;
- MOON and GNOO supported REMPEC and several national authorities (i.e. Croatia, Cyprus, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Slovenia and Spain) in managing oil spill emergency crises and in training exercises.

