CNR
IAS
ISTITUTO PER LO STUDIO
DEGLI IMPATTI ANTROPICI
E SOSTENIBILITÀ
IN AMBIENTE MARINO

www.ricercamarina.it

www.cnr.it

9th EuroGOOS International Conference: Advances in Operational Oceanography

Expanding Europe's Ocean Observing and Forecasting Capacity

A modern paradigm of the risk assessment from sea pollution in coastal areas

Quattrocchi G., Ribotti A., Sorgente R., Pes A., Pessini F., Perilli A. Sinerchia M. and Cucco A.*

Giovanni Quattrocchi

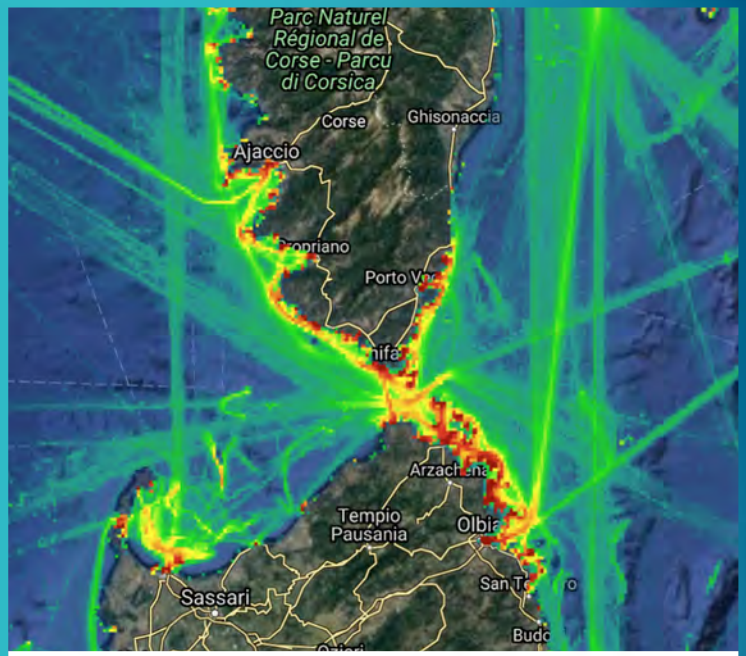
Researcher at CNR-IAS

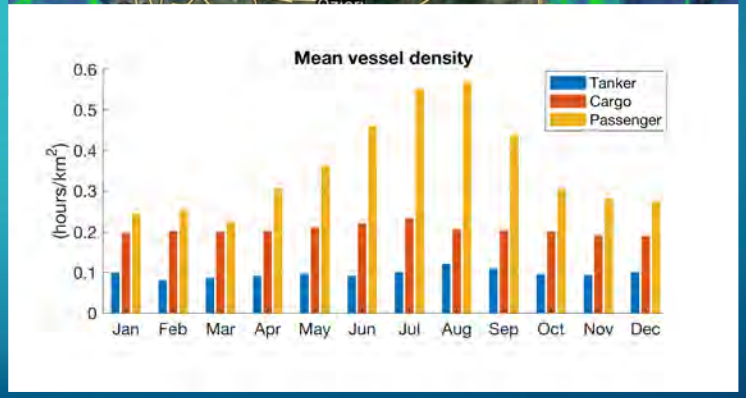
giovanni.quattrocchi@cnr.it

MOTIVATION

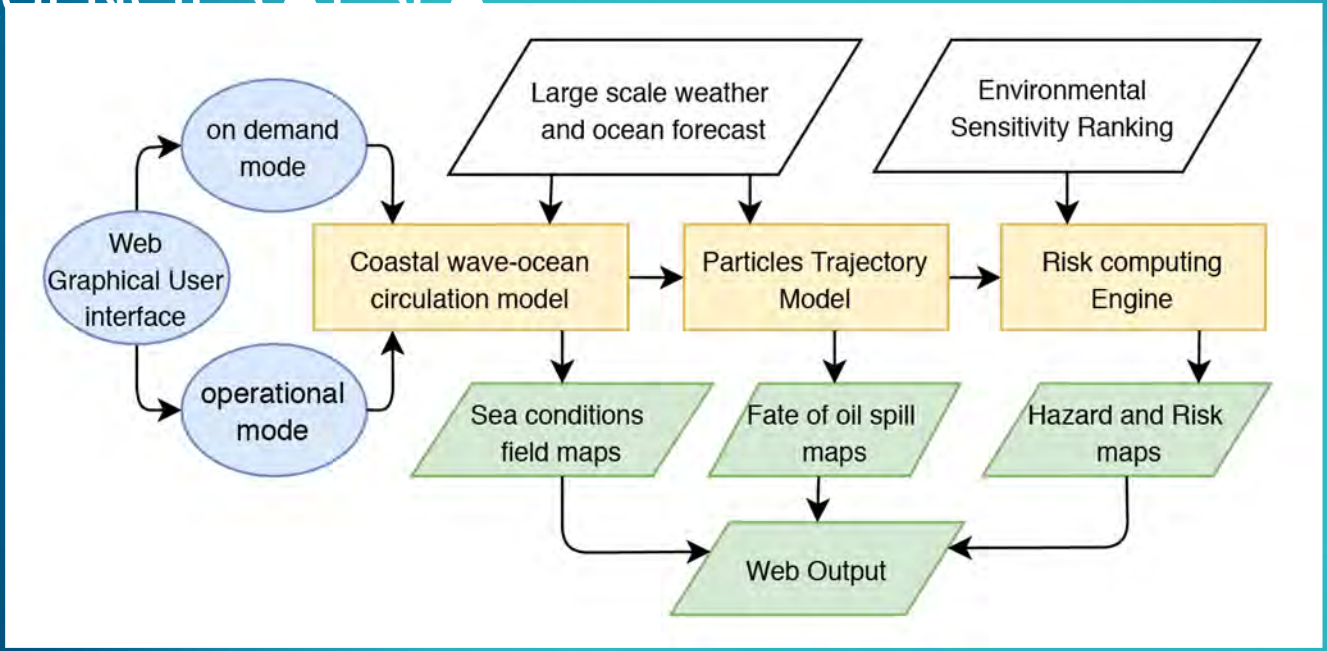
VESSEL TRAFFIC IS A SERIOUS THREAT FOR WORLD COASTAL AREAS

SEA STRAITS ARE VULNERABLE AREAS





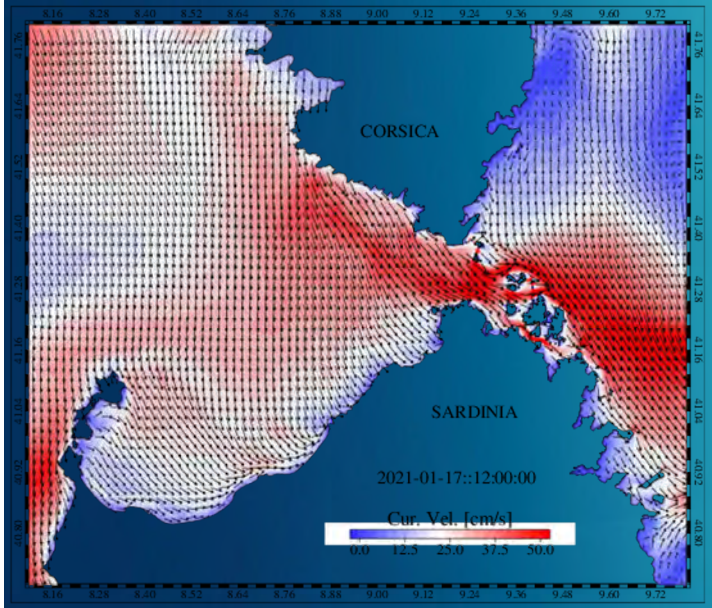
NUMERICAL SYSTEMS CAN BE USED TO PLAN COASTAL SEA SPACE AND MANAGE EMERGENCIES AT SEA



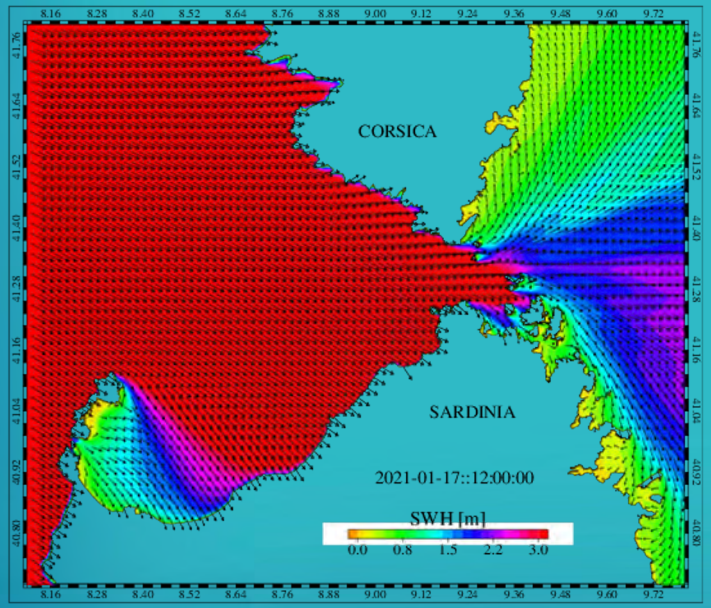
Quattrocchi et al. 2021 in Frontiers in Marine Science

THESE SYSTEMS RELIES ON HIGH RESOLUTION COASTAL OCEAN FORECAST

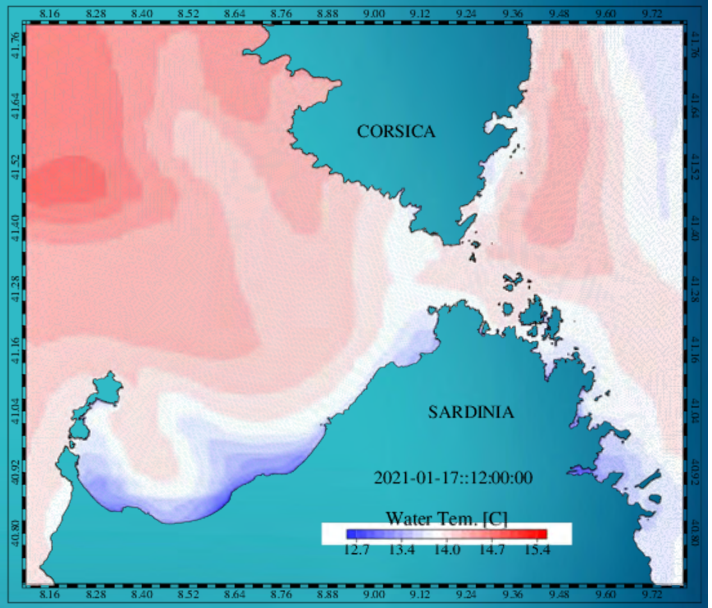
Sea surface circulation



Wave height and direction

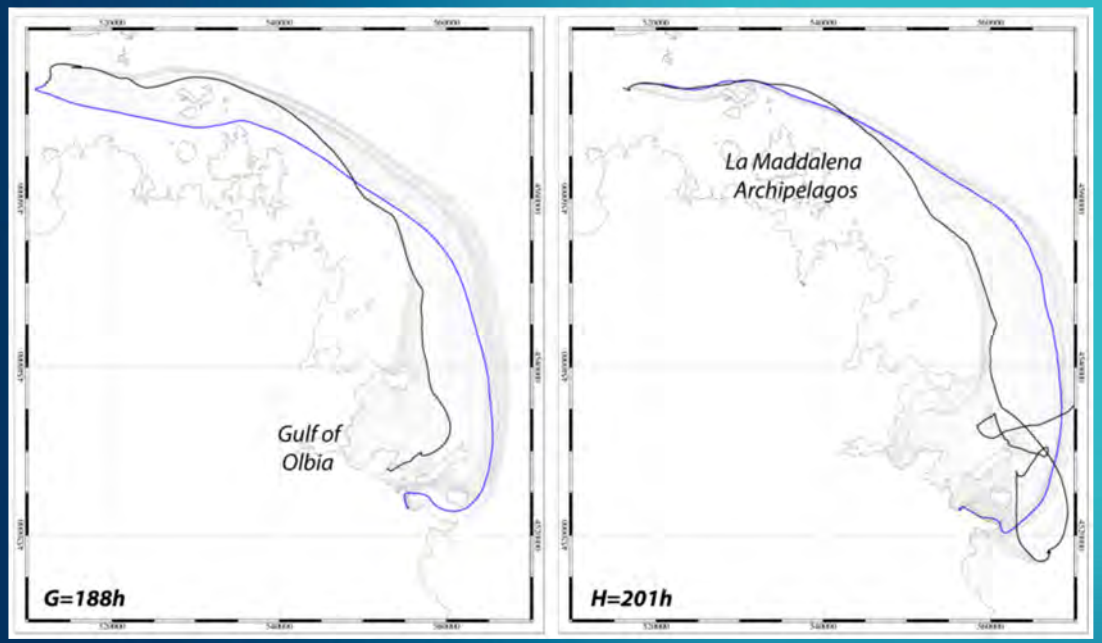


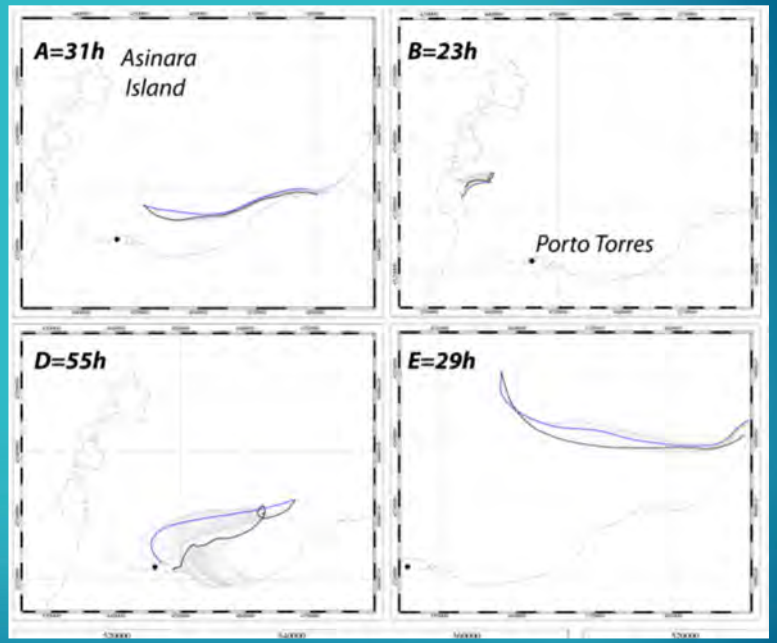
Sea surface temperature



CALIBRATION PROCEDURES WILL DRIVE THE MODEL SOLUTIONS TOWARD AT–SEA MEASUREMENTS

$$TRE(t) = \frac{\sqrt{(x_0 - x_m)^2 + (y_0 - y_m)^2}}{D_0}$$





RISK AT COAST

*Vessel Traffic Hazard * Shoreline Sensitivity*

INNOVATIONS

- ***Vessel traffic as source of hazard***
(i.e. vessel density)

- ***Intrinsic environmental vulnerability***
(i.e. natural shoreline recovery)

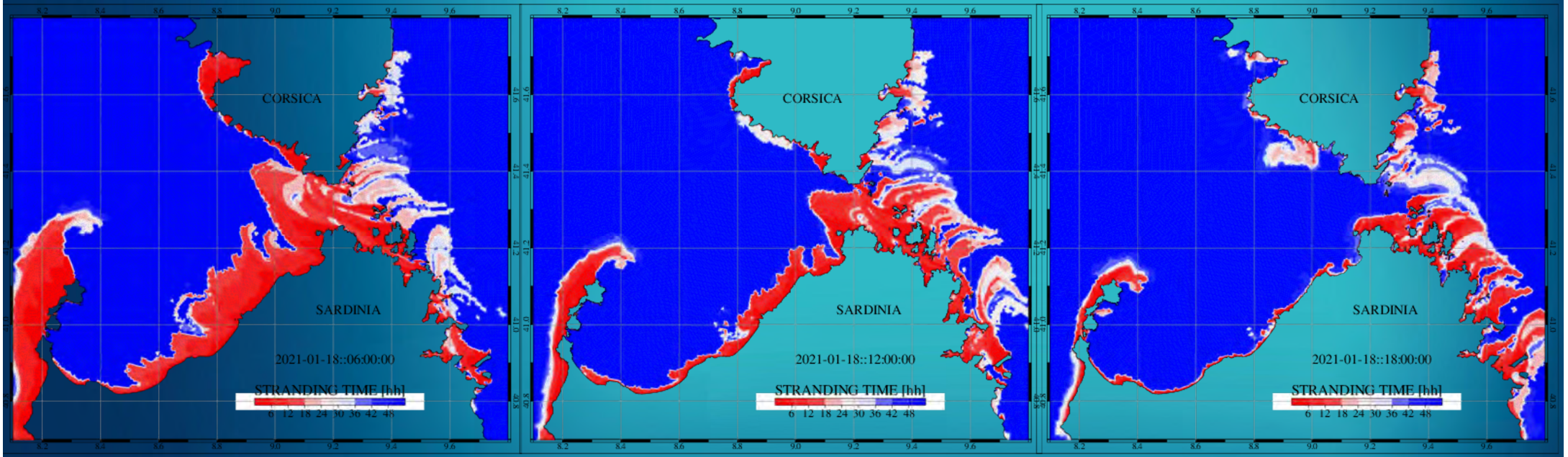
- ***Stranding time computation***
(i.e. identification of endangered waters)

- ***Interactive web services implementation***
(i.e. intuitive tool for final users)

STRANDING TIME to identify potentially endangered waters

An intense Mistral event

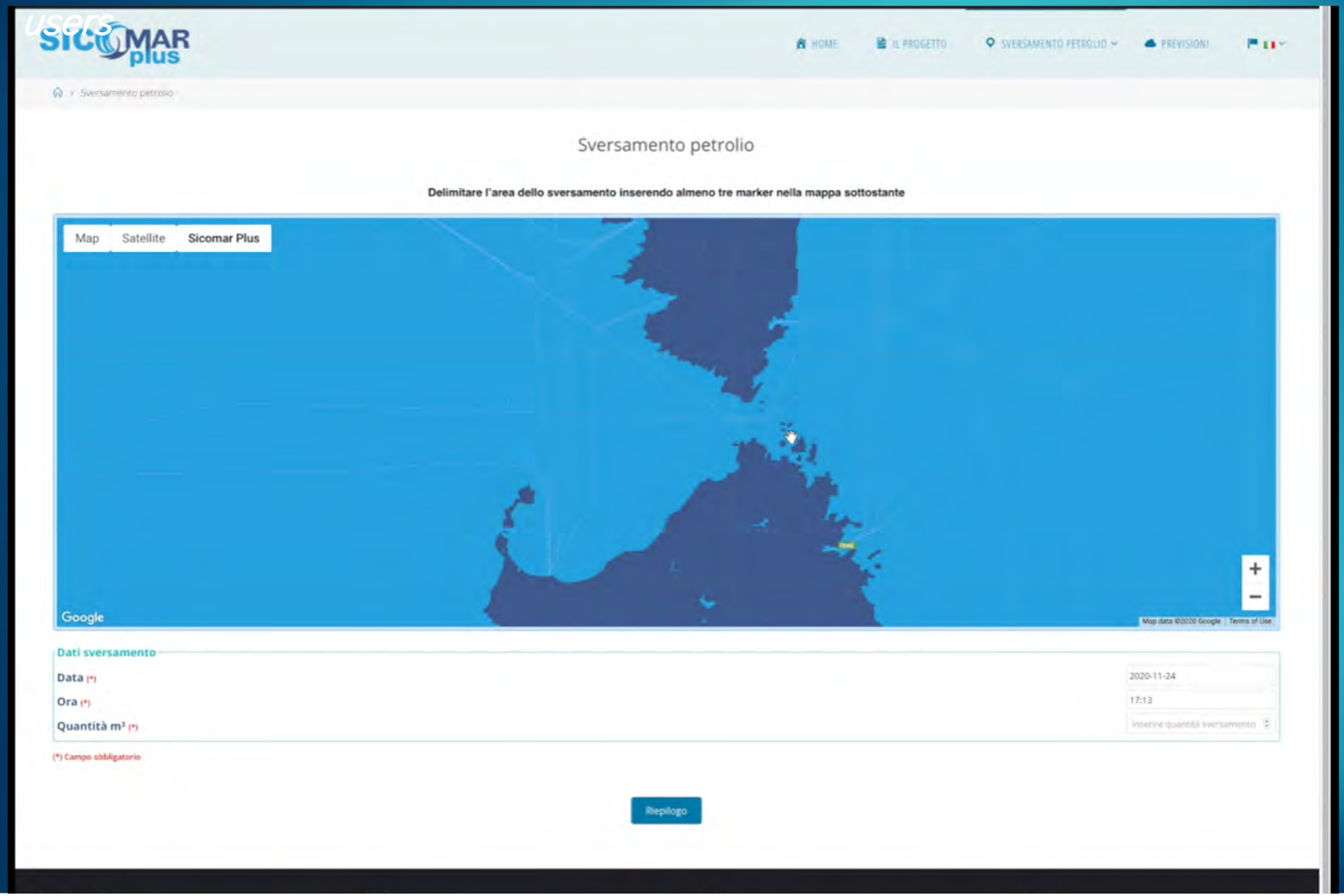
2021-01-18 **06:00:00** **12:00:00** **18:00:00**



CNR IAS
www.ricercamarina.it

www.cnr.it

INTERACTIVE WEB SERVICES: an intuitive tool for final users



CONCLUSIONS

- Consider the real-time evolution of vessels traffic as a serious threat for marine ecosystems that need to be monitored and properly managed
- Upgrade existing risk assessment systems (indicators and software) to meet the need of stakeholders, professionals and public
- Introduce intuitive tools to manage at-sea emergencies and promote a sustainable planning of coastal areas

CNR IAS
www.ricercamarina.it

Giovanni Quattrocchi – Istituto per lo studio degli Impatti Antropici e Sostenibilità in ambiente marino –
giovanni.quattrocchi@cnr.it

www.cnr.it