La scienza del mare e lo sport assieme per l'Oceano

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cmcc
Centro Euro-Mediterraneo sui Cambiamenti Climatici

Sailing4Ocean Milano, 22 Giugno 2023

cmcc
Centro Euro-Mediterraneo
sui Cambiamenti Climatici

Climate change *in the* future
fast changing world

www.cmcc.it

MISSION

Realizzare studi e modelli del nostro sistema climatico
e delle sue interazioni con la società per garantire
risultati affidabili, tempestivi e rigorosi al fine di stimolare
una crescita sostenibile, proteggere l'ambiente e sviluppare,
nel contesto dei cambiamenti climatici, politiche
di adattamento e mitigazione fondate
su conoscenze scientifiche.
Sviluppare previsioni e analisi quantitative del nostro
pianeta e della società del futuro.

SEDI

Il CMCC è organizzato sotto forma di network distribuito per tutto il paese con sedi in **Lecce, Bologna, Caserta, Milano, Sassari, Venezia e Viterbo.**

Il network connette entità pubbliche e private che lavorano insieme su ricerche multidisciplinari di interesse per le scienze del clima.

MEMBERS AND INSTITUTIONAL PARTNERS

- National Institute of Geophysics and Volcanology (INGV)
- University of Salento
- Ca’ Foscari University Venice
- University of Sassari
- University of Tuscia
- Polytechnic University of Milan
- Resources for the Future (RFF)
- University of Bologna

ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

UNIVERSITÀ DEL SALENTO

Università Ca'Foscari Venezia

uniss UNIVERSITÀ DEGLI STUDI DI SASSARI

UNIVERSITÀ DEGLI STUDI DELLA Tuscia

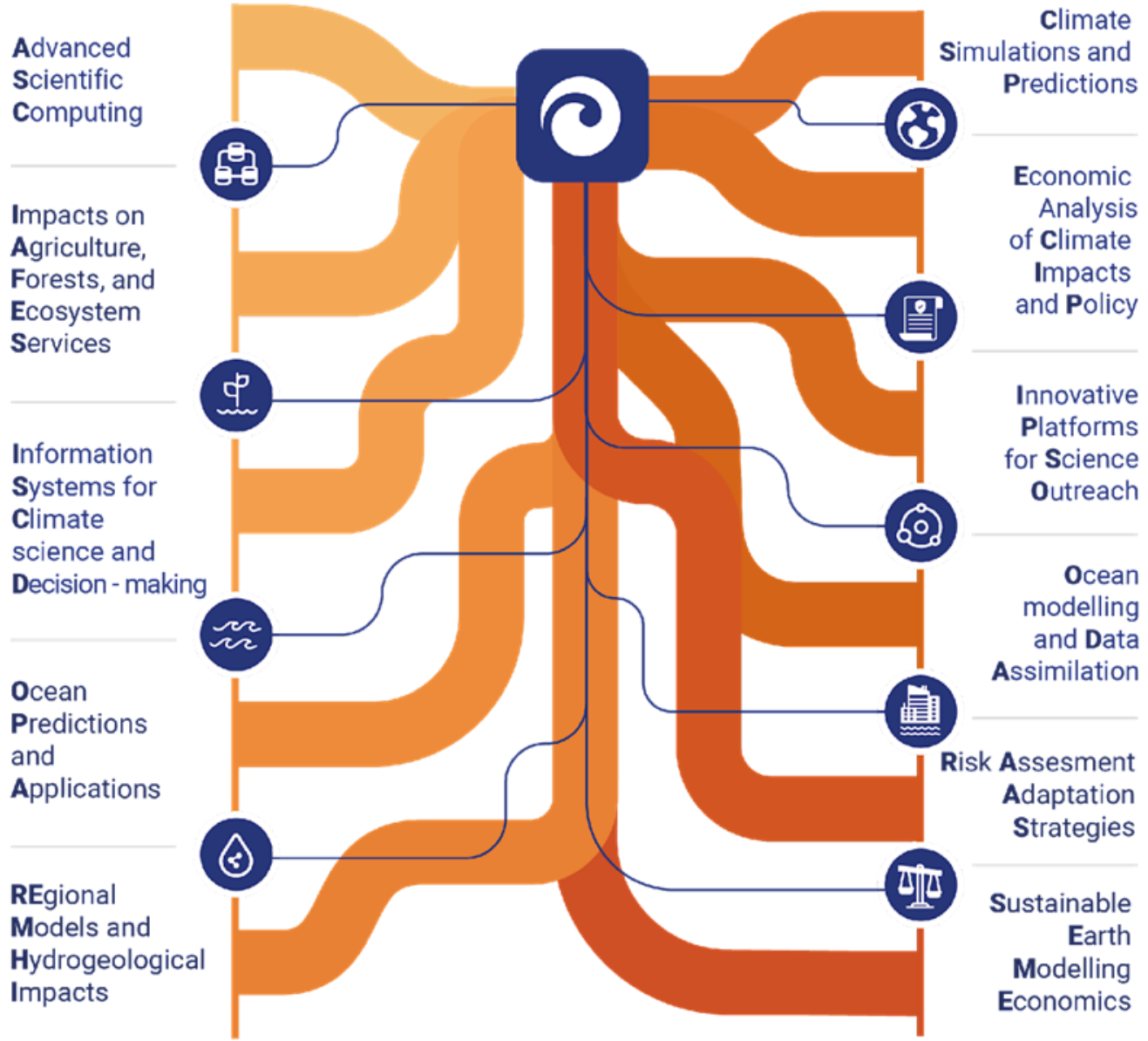
POLITECNICO MILANO 1863

RESOURCES for the FUTURE

ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

RICERCA INTERDISCIPLINARE

Il CMCC promuove l'integrazione e la collaborazione tra diverse competenze interdisciplinari, necessarie per gli studi relativi alle scienze del clima.



IL CENTRO DI SUPERCALCOLO (SCC)

Dal 2008, il CMCC possiede il proprio Centro di Supercalcolo (SCC), situato a Lecce nel campus dell'Università del Salento.

Il Centro è fra i più avanzati in Europa e rappresenta la più potente struttura computazionale in Italia dedicata interamente alla ricerca sul clima.

Attualmente il CMCC sta costruendo un nuovo centro di supercalcolo presso la sede di Lecce, che includerà migliorie sia nella struttura di calcolo che nei sistemi di stoccaggio.

24,769 *cores*

2,400 *TFlops*

Prestazione di picco teorica
(1TFlop = 1,000 miliardo di operazioni per secondo)

32 PetaBytes *over* Capacità (del sistema) di stoccaggio

40 PetaBytes Biblioteca a nastro (sistema di archiviazione)

cmcc

Sistemi osservativi, modellistica e soluzioni sul clima e il mare

Oceano Globale

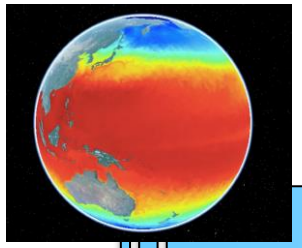
Mari Regionali: Copernicus Mediterraneo e Mar Nero

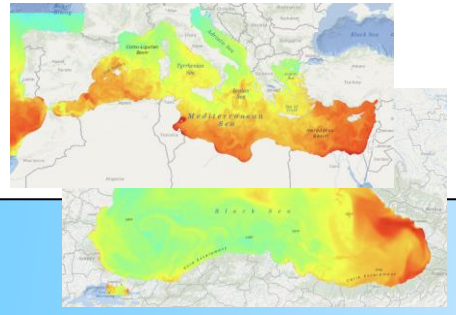
Scala costiera mari Italiani

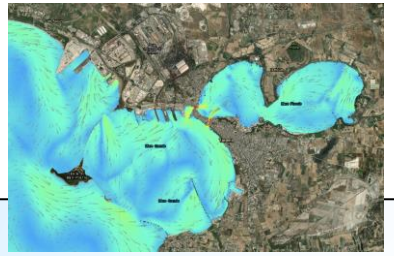
Scala costiera, bacini idrologici, foci dei fiumi, lagune, Porti

Scorsi decenni---- > 2100

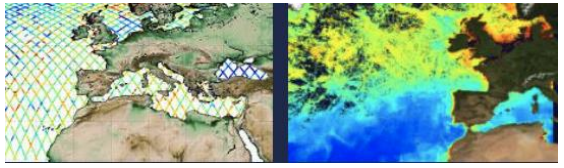
Modelli







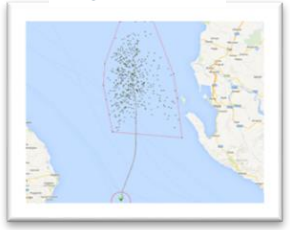
Osservazioni



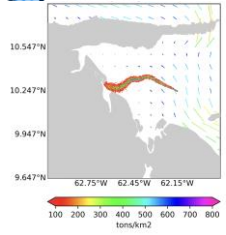
Applicazioni

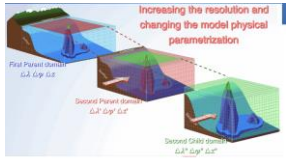
VISIR ®
discoVerIng Safe
and effIcient Routes

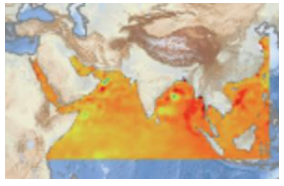
OCEAN-SAR
Effective Maritime
Search and Rescue

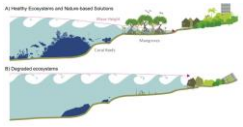


WITOIL
Calculate Patterns of Oil
release in the Sea










CLIMATE CHANGE
MARINE MONITORING
ATMOSPHERE MONITORING
LAND MONITORING
SECURITY
EMERGENCY MANAGEMENT
opernicus
Services

One central map viewer

to visualise all EMODnet data

1 OCEAN 1 EMODnet

One single portal

One central metadata catalogue

to enhance data search and discovery

140 partners

+100 use cases

Discover, visualise and download marine data and products across 7 thematics and hundreds of parameters

BATHYMETRY

HUMAN ACTIVITIES

PHYSICS

GEOLOGY

SEABED HABITATS

CHEMISTRY

BIOLOGY

EMODNET.EC.EUROPA.EU

YOUR GATEWAY TO *IN SITU* MARINE DATA IN EUROPE AND BEYOND

EMODnet

Copernicus Marine Service

Ocean Observing/Forecasting – an imperative

To meet and support

- Societal challenges
- Sustainable management of the ocean and its resources
- Blue Growth and blue economy

1 POLAR ENVIRONMENT MONITORING

2 MARINE CONSERVATION & POLICIES

3 SCIENCE & CLIMATE

4 NATURAL RESOURCES & ENERGY

5 WATER QUALITY

6 COASTAL MONITORING

7 SOCIETY & EDUCATION

8 MARINE FOOD

9 MARINE NAVIGATION

10 SAFETY & DISASTER

SUSTAINABLE DEVELOPMENT GOALS

Copernicus Marine Service

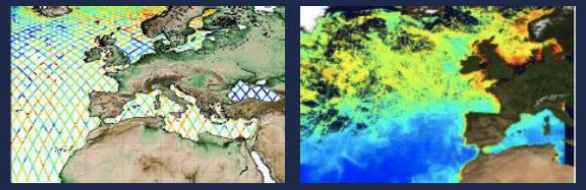
DATA →

Ocean Products – 3 sources

Satellite data

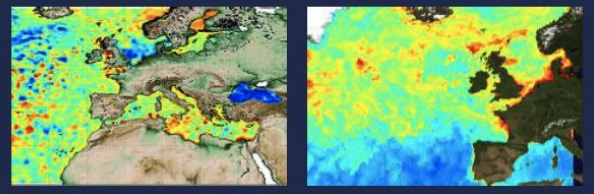
Available in 2 **processing Levels**

- **L3** – daily composite products, single/multi sensor (Along Track or gridded product)



SSH L3 NRT Along Track products (left)
Chl-A OLCI NRT L3 (right)

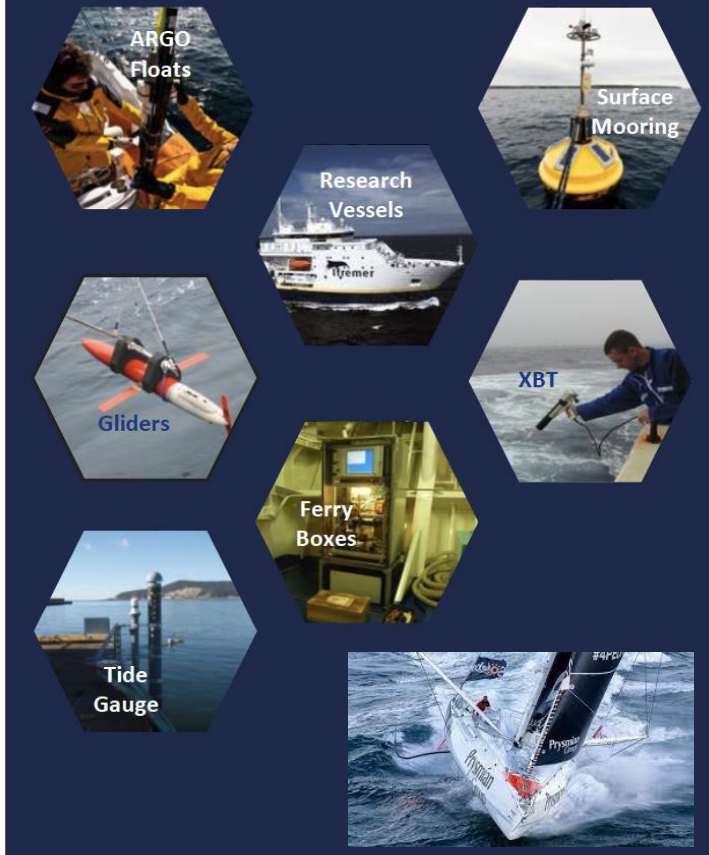
- **L4** – daily interpolated and weekly/monthly composites



SSH L4 NRT Gridded Products (left)
Chl-A REP L4 Copernicus Globcolour (right)

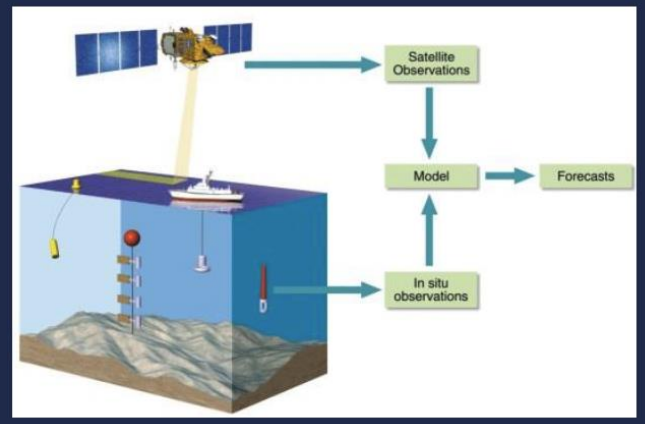
InSitu data

From different networks and platforms

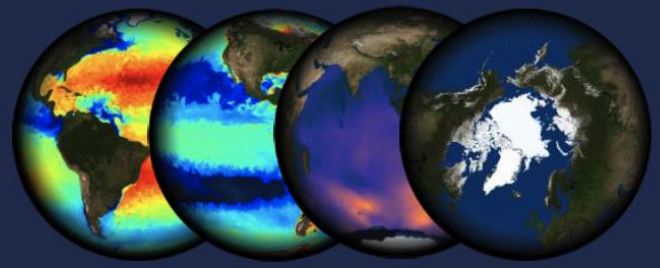


Model data

From 3D numerical representation of the ocean with an assimilation of « real » data

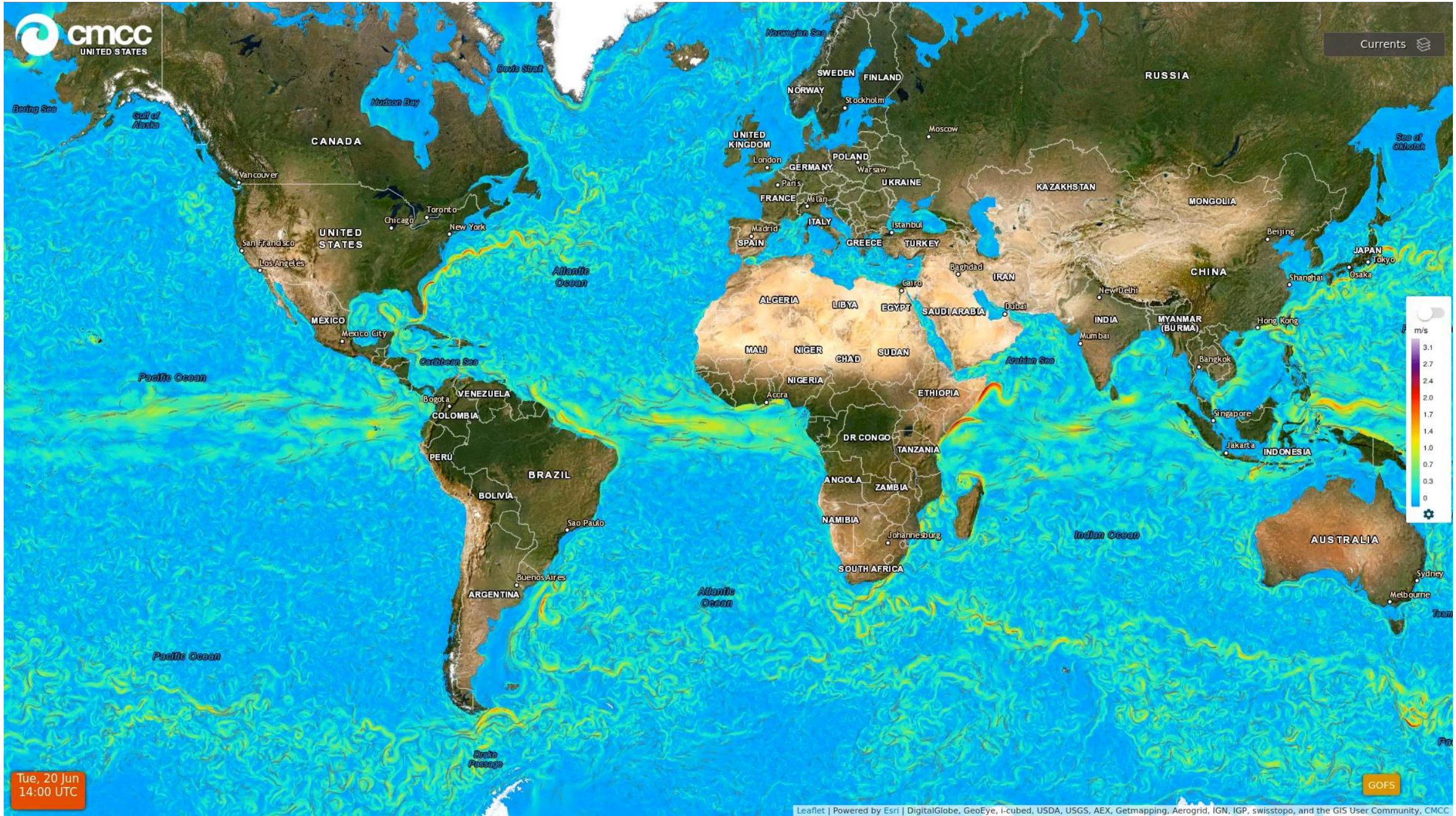


Physical, bio, wave and sea ice models are operated

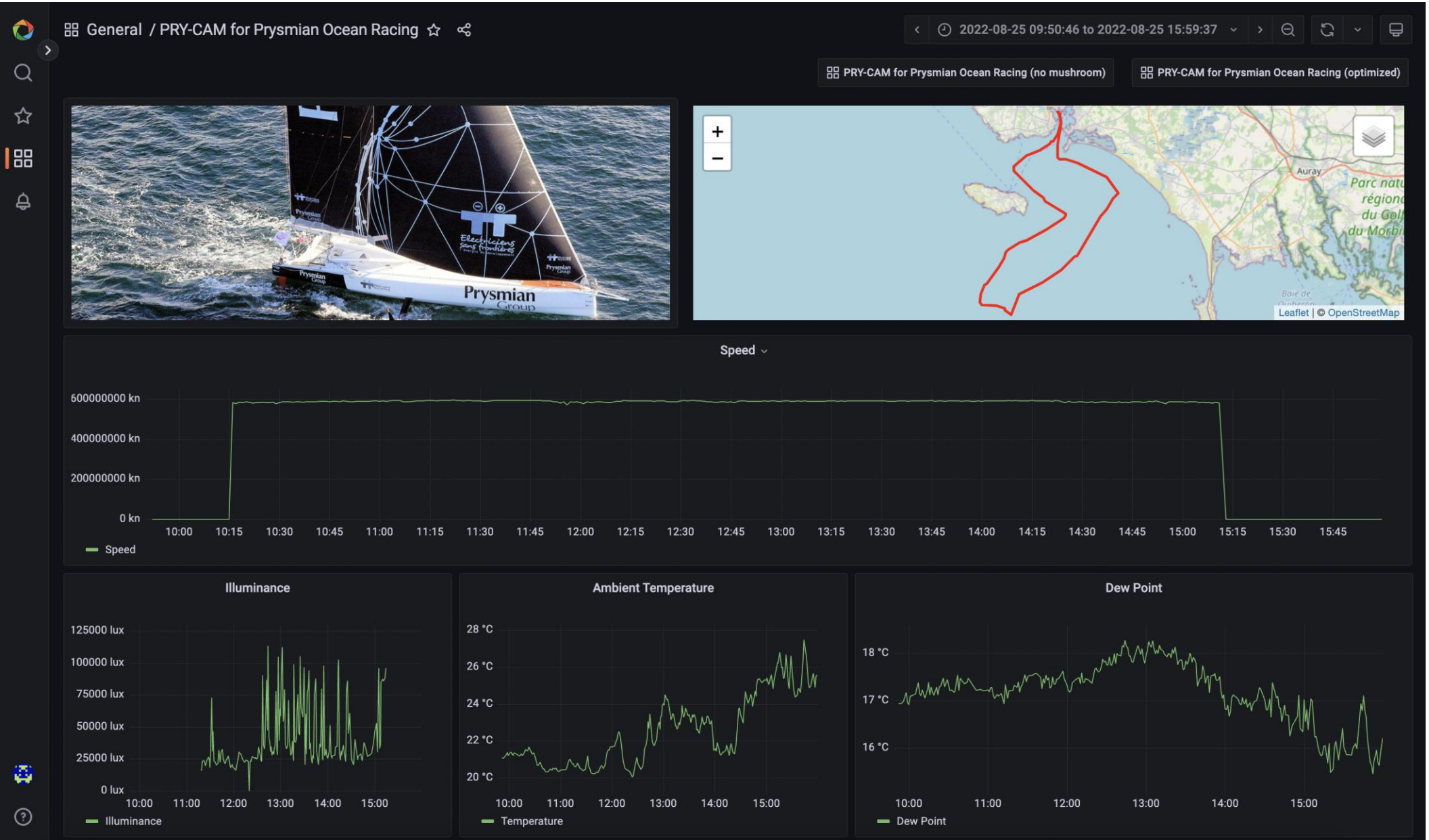


L’oceano costiero globale

https://gofs.cmcc.it https://medfs.cmcc.it https://bsfs.cmcc.it

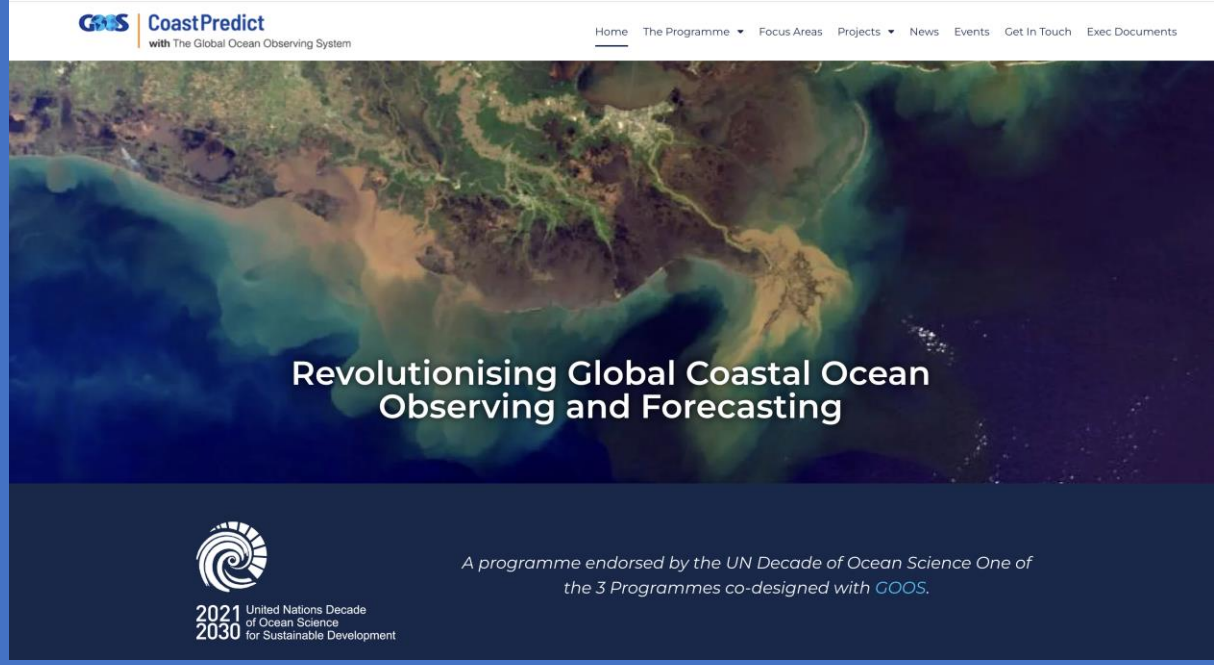


I dati raccolti



I dati raccolti

UN Ocean Decade



CoastPredict will redefine the science of observing and predicting the Global Coastal Ocean to help the Ocean Decade succeed in its aims.

It will include co-designing the infrastructure needed, and offering open and free access to coastal information to give us the ocean we need for the future we want.

CoastPredict
with The Global Ocean Observing System

PredictOnTime (https://PredictOnTime.org)

The Core project "PredictOnTime" will deliver new predictive capacities, services and products for the global coastal ocean based on innovative integrated observing systems and forecasting systems implemented and tested at selected Pilot areas.

The PredictOnTime will deliver a relocatable, easy to be deployed, cost effective observing and forecasting system of systems as well as best practices. The observing and forecasting systems will be deployed and tested with users and stakeholders in Pilot coastal areas in more than 20 nations in the global coastal ocean.

We will focus on observing and predicting natural extreme events in the global coastal ocean on due time and with the appropriate accuracy so that impacts on natural and human resources and assets will be minimized.

We will develop and consolidate the communities science observing capacities and support through the new predictive capability the innovative and sustainable applications for coastal solutions/services.

GOOS | CoastPredict
with The Global Ocean Observing System

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