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IBISAR downstream service: helping SAR operators and emergency responders to select the most accurate ocean forecast

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IBISAR TEAM

Project Coordinator

- ~ 40 people (5 in IBISAR)
- Mallorca Island, Spain
- Scientific excellence with impact on society
- Data management capacities
- Products and services strategy
- Outreach and society engagement

Project Co-Contractor

- > 5000 employers (3 in IBISAR)
- Australia, Asia, Europe and North America
- Technical skills (ICT tools)
- Tailor-made products
- Industry involvement
- Large client base (25 countries)

Project Co-Contractor

- ~ 240 people (3 in IBISAR)
- Basque country, Spain
- EU Projects coordination experience
- HFR activities at EU level
- Leaders of CMEMS-SE INCREASE, COMBAT, HFR-TT CMEMS-INSTAC Phase 2

Spanish SAR agency

Main target user

- >1600 people
- User Feedback and engagement

Spanish Port System

Collaborator

- Key actor in CMEMS, IBI region
- Responsible for IBI INSTAC and MFC

DOWNSTREAM SERVICE – MARKETS & USERS

SOCIB missions cover 10 sectors: (Heslop et al. 2019)


Marine & coastal research


Maritime safety


Marine sports


Coastal protection, planning, governance


Sustainable marine ecosystems


Ports and shipping


Sustainability of islands & climate change


Education


Beach & coastal communities


Ocean management

IBISAR motivation:

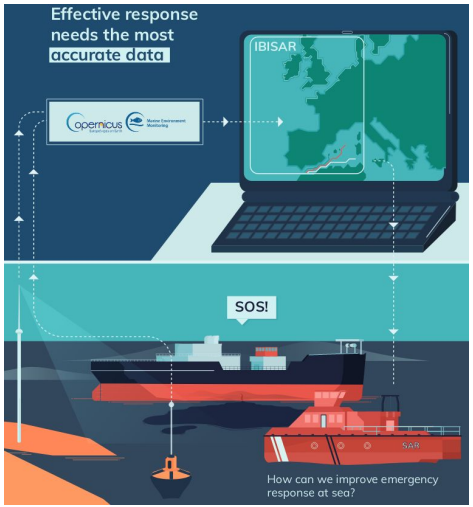
- Need of user-friendly automated data quality assessment
- Lack of easy interpretable metrics for confidence indicators

IBISAR objectives:

- Provide real-time ocean product ranking in the IBI area
- Guide the users to select the most accurate current forecast

IBISAR end-users:

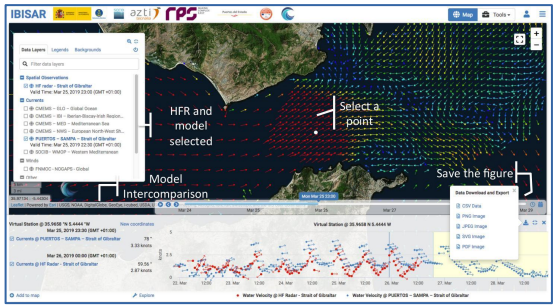
- SAR operators
- Maritime traffic
- Marine pollution
- Modelers



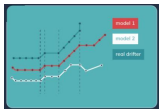
DOWNSTREAM SERVICE – DESCRIPTION

IBISAR
3 elements:

- **Updated Database**
  - Ocean model forecasts
  - HF radar observations
  - Drifter trajectories
- **OceanMap Viewer**



- **Skill Assessment functionality**
  - 1 Simulates trajectories using all available datasets
  - 2 Compares simulated vs. real drifters and calculates skill score
  - 3 Ranks datasets based on their performance



Available in November 2019

Free access to the service under registration
www.ibisar.es

Login page

CMEMS PRODUCTS IN USE

CMEMS products:

- Ocean model forecast
- In situ drifter trajectories
- HF radar observations

We use products in:

- Real time and forecast
- Delayed time

IBERIAN-BISCAY-IRISH REGIONAL SEAS

Parameters:

- Surface currents velocities
- Drifter trajectories

HOW DO WE USE AND TRANSFORM CMEMS PRODUCTS?

DATA

→ downloaded and aggregated

→ displayed

→ used to simulate Lagrangian trajectories

→ used as reference source (drifters)

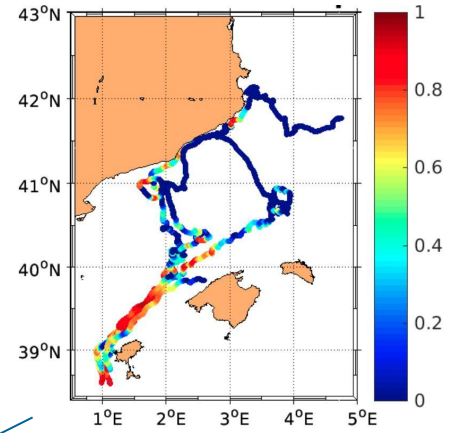
INFORMATION → easy interpretable metrics

Dimensionless index from 0 to 1

Datasets	Skill Score
CMEMS product 1	0.74
CMEMS product 2	0.55
CMEMS product 3	0.39
CMEMS product 4	0.23

Averaged over the area of interest

CMEMS-IBI-MFC

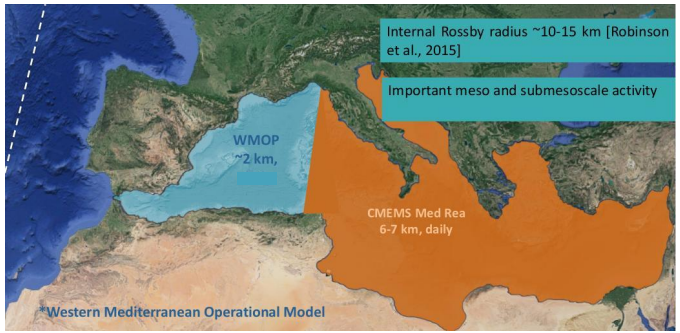


Skill score over 4 drifters

BENEFITS FROM CMEMS FOR SOCIB

Benefit 1:

Parent models for downscaling

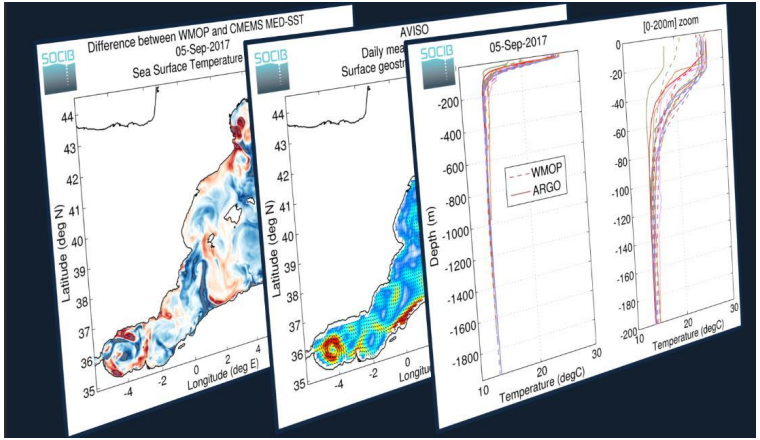


WMOP: downscaling from CMEMS-MED-MFC

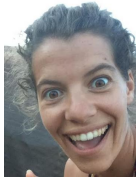
Benefit 2:

Satellite and in-situ NRT observations

for assimilation and assessment



WMOP: operational validation



Benefit 3:

Funding for hiring staff

and developing new services

BENEFITS FOR OUR END-USERS

Benefit 4: IBISAR is a user-friendly service with:

- Single access point
- Regularly updated and extended database
- Easy interpretable metrics of accuracy

Benefit 5: IBISAR will allow to:

- Support preparation of response at sea
- Optimize search area planning
- Minimize response time
- Allocate resources effectively

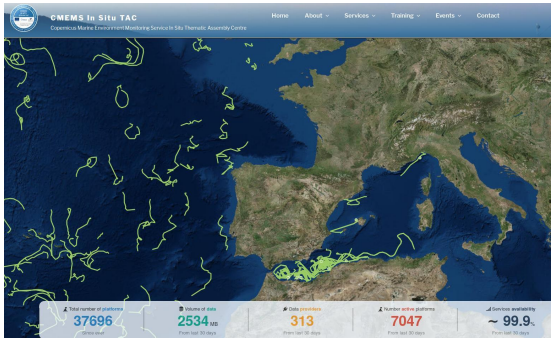
At the Spanish level: (yearly statistics of 2017)

- > 1500 SAR professionals
- > 4700 operations
- > 50% occur in coastal areas (4 km)
- ~ 99 persons/day (twice than 2016)
- > 300 000 monitored vessels

NEED FOR IMPROVEMENT IN CMEMS

Improvement for INSTAC

- Integration of complementary drifter databases (SASEMAR routines exercises, COSMO and CALYPSO research projects)

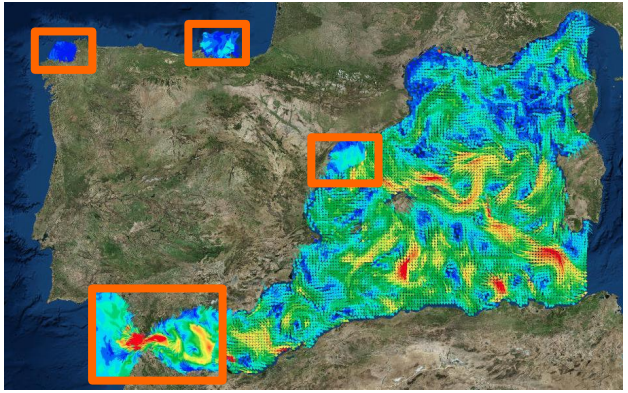


marineinsitu.eu: active drifters

- Improvement of drifter's trajectory bounding boxes calculation
- Generation of added value HF radar products: Gap-free data, HFR short term predictions

Improvement for MFCs

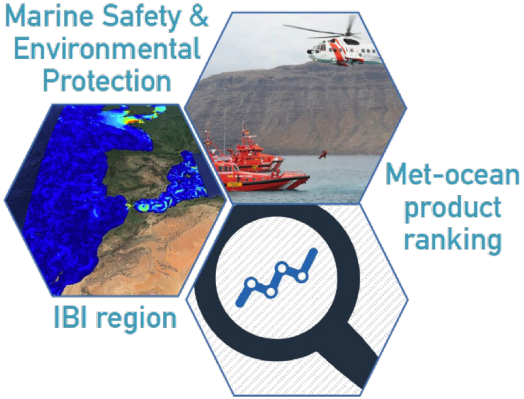
- Homogenization and standardization of the validation approaches
- Integrate IBISAR skill assessment to complement operational validation
- Integration of downscaled regional and coastal models



IBISAR viewer showing WMOP, SAMOA, SAMPA coastal and regional models

CONCLUSIONS

- SOCIB uses CMEMS products for:
  - model assessment
  - data assimilation
  - service development



- With multiple CMEMS products available now, end-users need user-friendly data quality assessment with easy-interpretable metrics

- IBISAR service:
  - guide users to select the most accurate ocean forecast in the IBI area
  - facilitate decision-making to SAR operators and emergency responders

- Request to CMEMS:
  - drifters data ingestion
  - HF radar added-value products generation

ACKNOWLEDGEMENTS

Spanish Port System

Spanish Maritime Safety and Rescue Agency

Operational Oceanography System of the Basque Country

COSMO project (CSIC-ICM)

INCREASE (CMEMS – Service Evolution)

IBISAR (CMEMS – User Uptake)

CMEMS – INSTAC – Phase 2