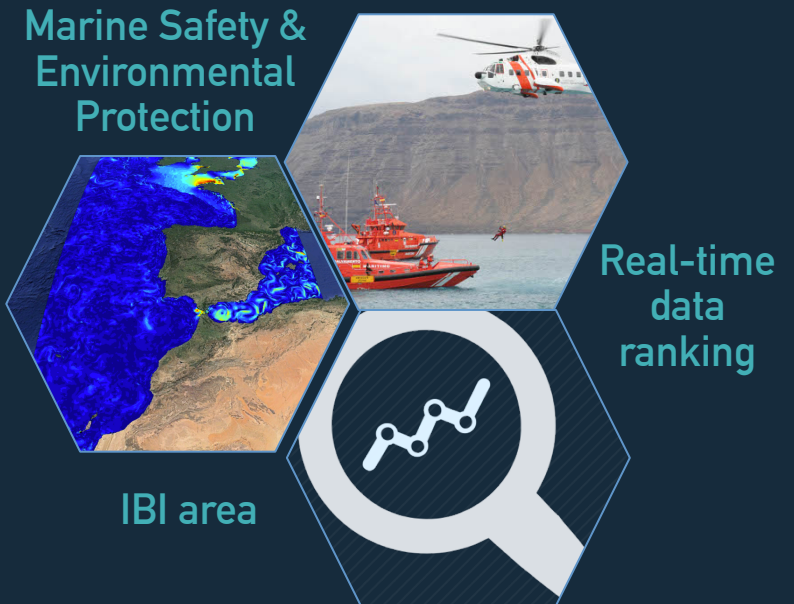


IBISAR downstream service: helping SAR operators and emergency responders to select the most accurate ocean forecast



Emma Reyes & Adèle Révelard
(on behalf of the IBISAR team)

- 01 Key numbers and facts
- 02 IBISAR: service overview
- 03 IBISAR: accurate data in 3 steps
- 04 IBISAR: main elements
- 05 IBISAR: validation – Ibiza Channel
- 06 Mutual benefits



01 KEY NUMBERS & FACTS

Spanish SAR Agency



310.000

People assisted in 25 years



19+1

Marine Rescue Centres



4

SAR responsibility areas



50 %

SAR cases within 4 km offshore



>4700

SAR operations

IBISAR



>1500

Spanish SAR professionals



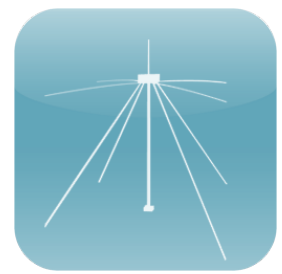
2

Areas of benefits



4

IBI-subregions



4

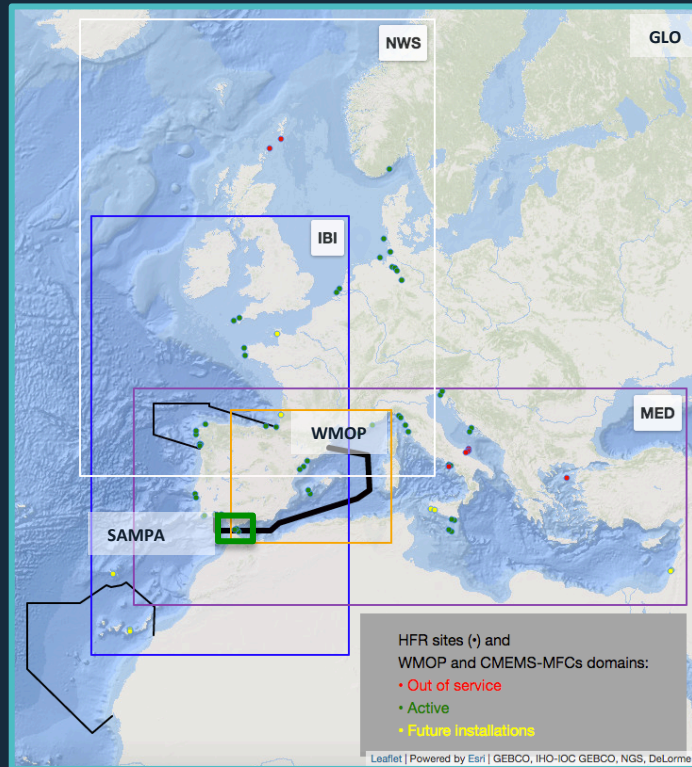
HF radar sites



4

Copernicus Marine Service models

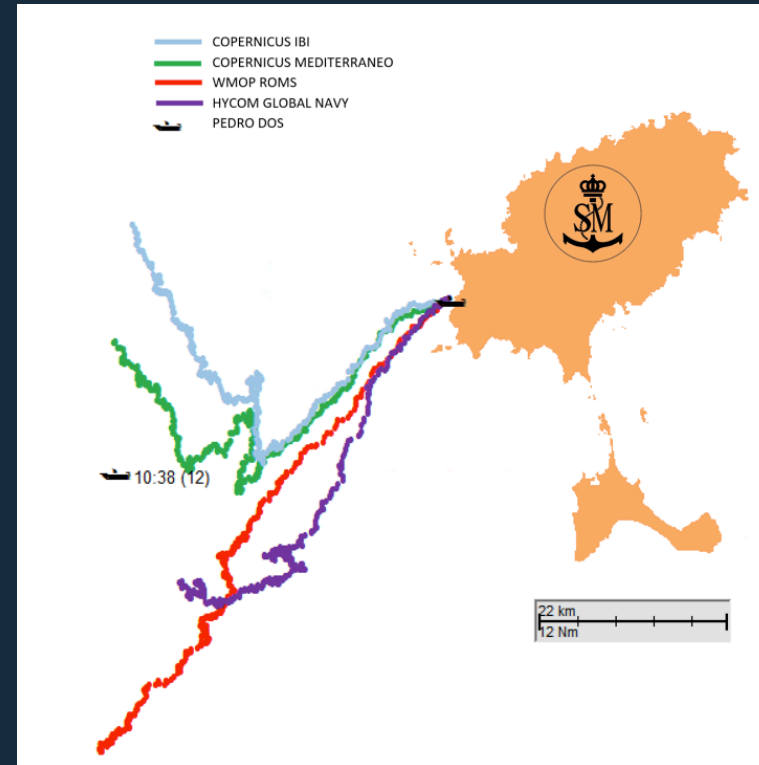
Copernicus Marine Service products are crucial...



Map showing CMEMS-MFC models overlapping in the IBI region and SAR areas

...to support Marine Safety & Environmental Protection

End-users overarching concern:
Impact of inaccurate data on decision-making



Simulated trajectories from different models: drifting motorboat "Pedro II"

SAR operators need data confidence

How can we improve emergency response at sea?



End-users needs

Reliable current observations and forecasting are essential

Easily interpretable metrics

User-friendly automated skill assessment

Effective response
needs the most
accurate data



IBISAR service

Provides **real-time** information of the **most accurate** ocean current **forecast** in the **IBI** area

Facilitates **decision-making** to SAR operators and emergency responders

End-users needs

Reliable current observations and forecasting are essential

Easily interpretable **metrics**

User-friendly automated skill **assessment**

03 IBISAR: ACCURATE DATA IN 3 STEPS



1.- Simulates trajectories using available forecast models



03 IBISAR: ACCURATE DATA IN 3 STEPS



1.- **Simulates** trajectories using available forecast models



2.- **Compares** simulated trajectories vs. real drifters

03 IBISAR: ACCURATE DATA IN 3 STEPS



GOBIERNO DE ESPAÑA



Puertos del Estado



1.- Simulates trajectories using available forecast models

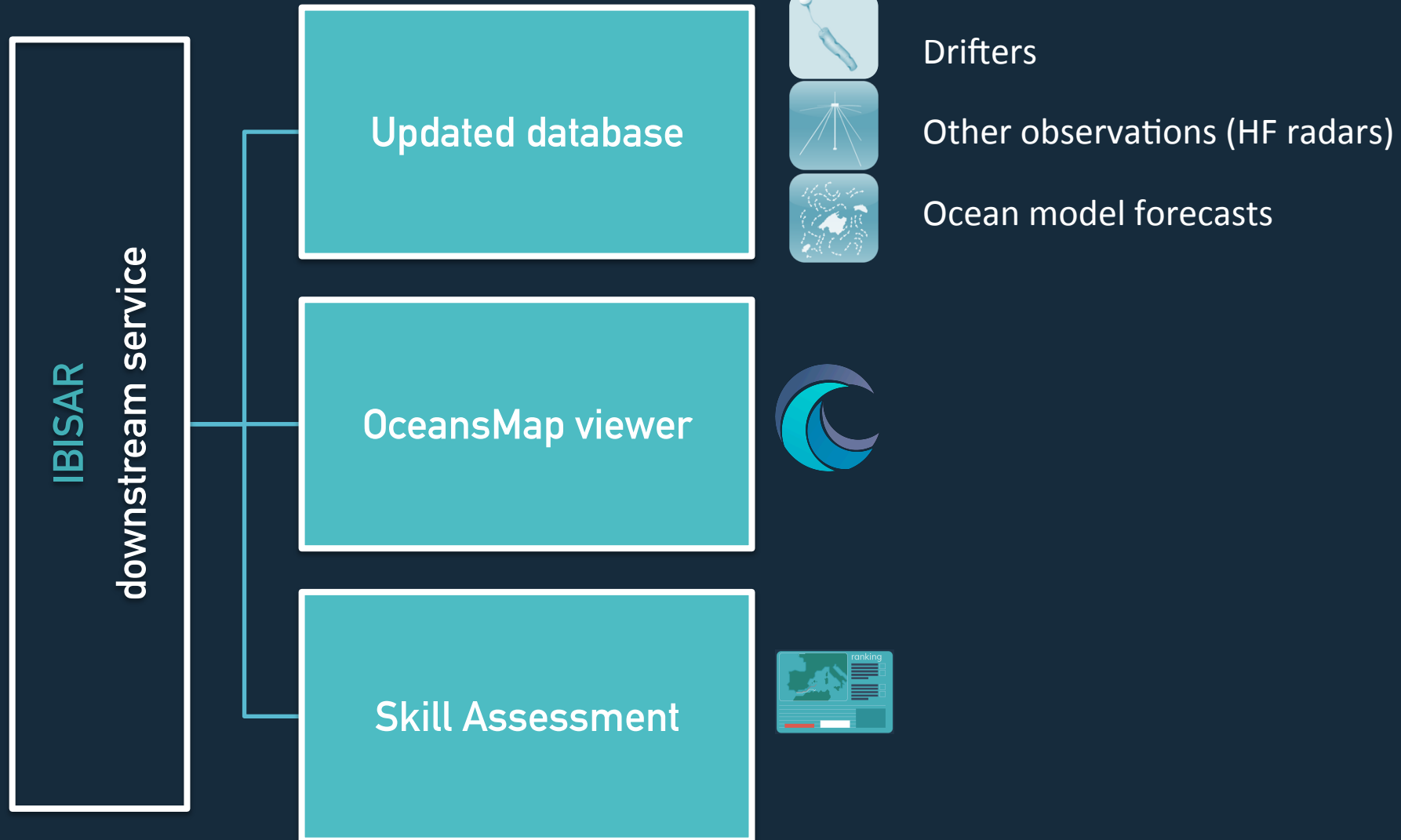


2.- Compares simulated trajectories vs. real drifters



3.- Ranks models based on their performance



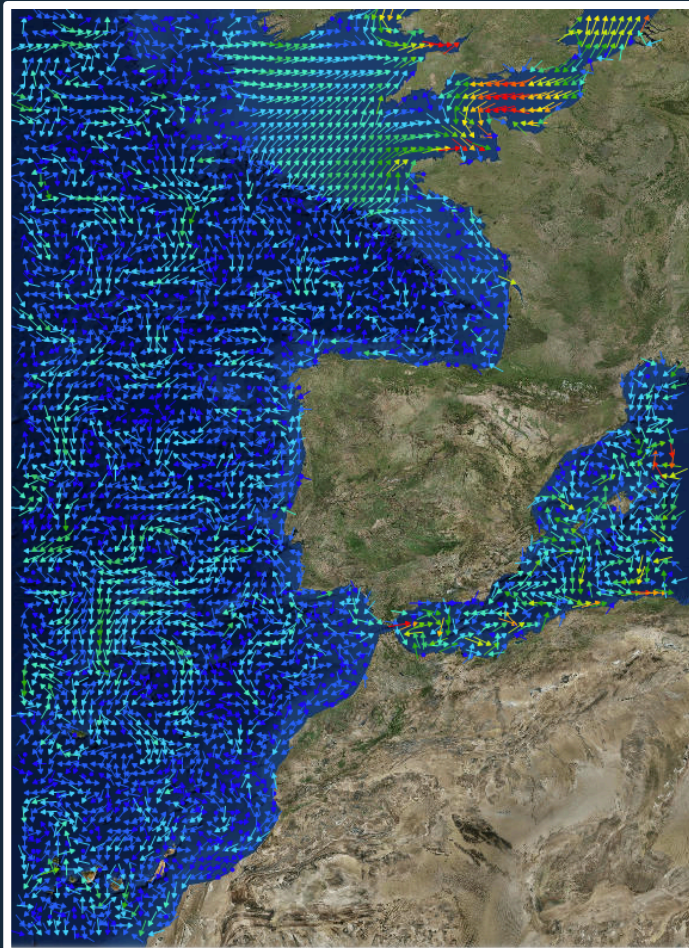


04 COPERNICUS MARINE SERVICE PRODUCTS USED

Ocean models

What? Current forecast

How? Target sources



◀ Ocean
current forecast

In-Situ Data

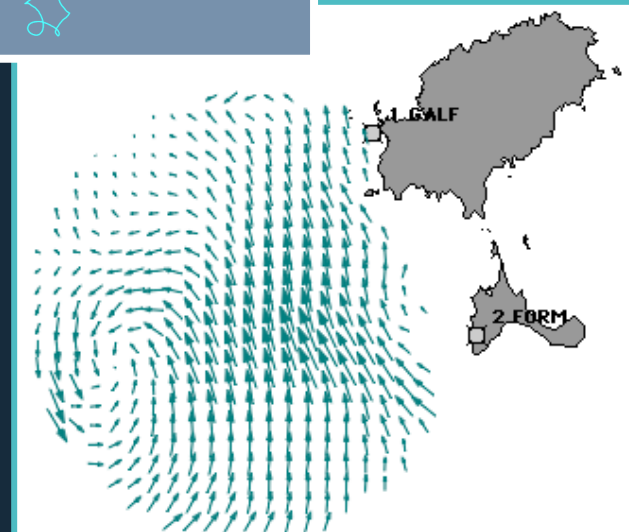
What? Current surface observations

How? Reference source



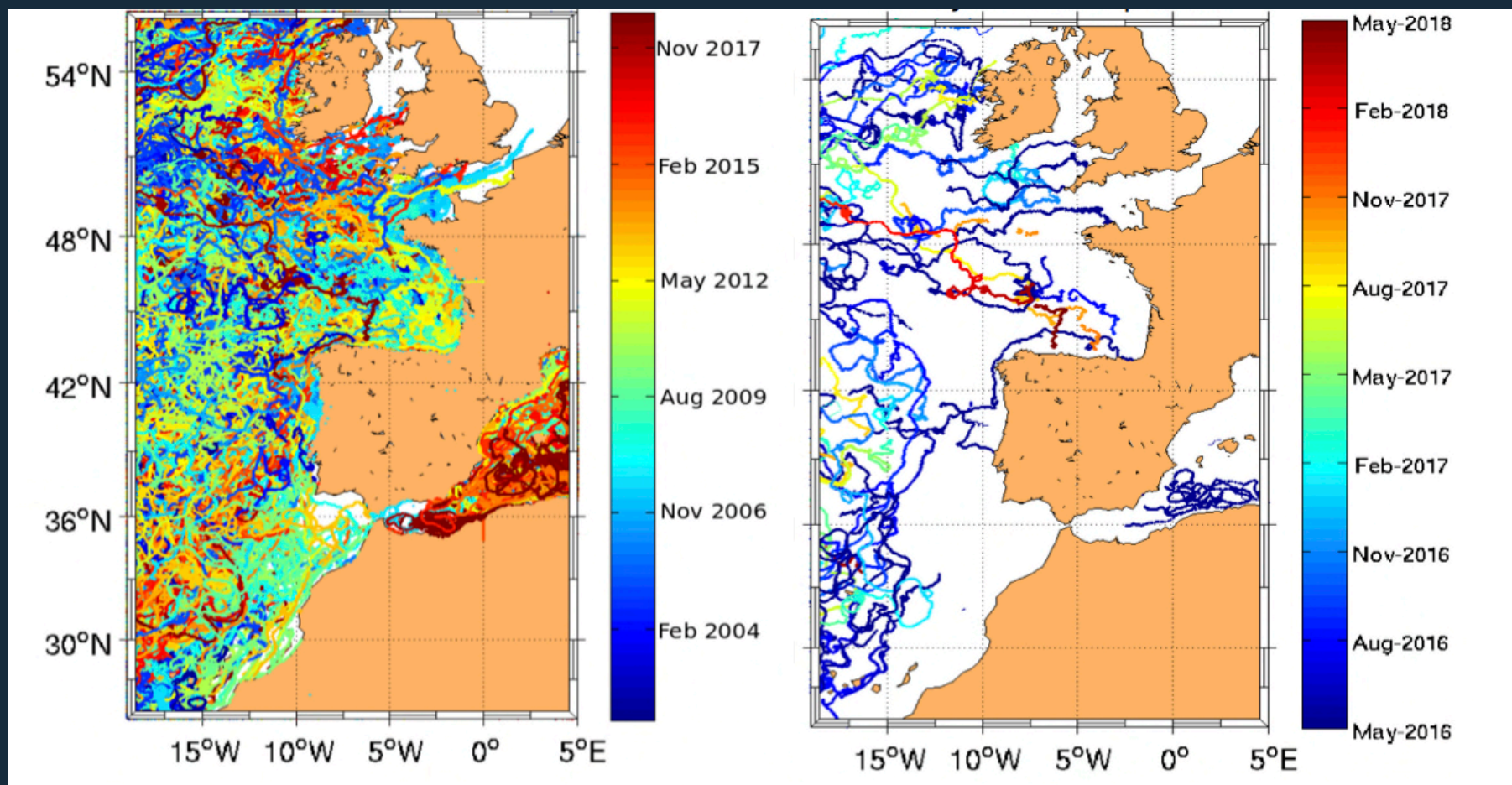
◀ Drifter
trajectories

HFR surface
currents ▶



04 COPERNICUS MARINE SERVICE PRODUCTS USED

Drifter trajectories in the IBI region

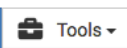


1999 - present

2016 – May 2018

<http://jovellanos.oceansmap.com/IBISAR/#>

IBISAR



Data Layers Legends Backgrounds

Filter data layers

Spatial Observations

- ☐ HF radar - Strait of Gibraltar

Currents

- ☐ CMEMS - GLO - Global Ocean
- ☒ CMEMS - IBI - Iberian-Biscay-Irish Regio...
Valid Time: Mar 26, 2019 15:30 (GMT +01:00)
- ☐ CMEMS - MED - Mediterranean Sea
- ☐ CMEMS - NWS - European North-West Sh...
- ☐ PUERTOS - SAMPA - Strait of Gibraltar
- ☐ SOCIB - WMOP - Western Mediterranean

Winds

- ☐ FNMOC - NOGAPS - Global

Other

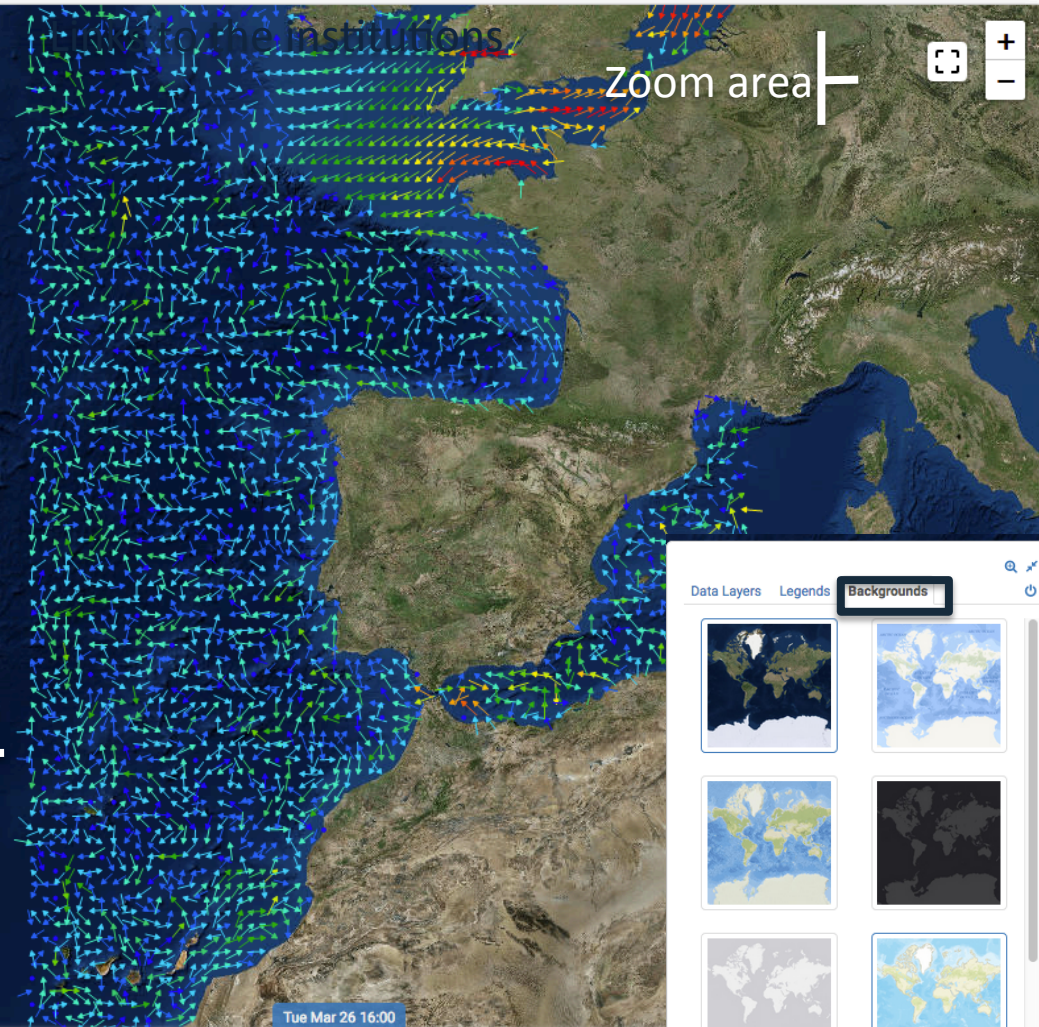
- ☐ Surface drifters - Iberian-Biscay-Irisheland...
- ☐ Moored_Buoy_WMS
- ☐ SLDMB_SKILL_WMS

Backgrounds
Search box

Layers with
info

Current forecast/
observation

Time Slider



Data Layers Legends Backgrounds

Backgrounds

300 km
200 mi

51.89005 -1.75781

Leaflet | Powered by Esri | USGS, NOAA, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, G... Mar 24 ... Mar 25 ... User Community

Mar 26

Mar 27

Data Layers Legends Backgrounds

Q SAMPA

Currents

☑️ PUERTOS - SAMPA ...

Valid Time: Mar 25, 2019 22:30 (GMT +01:00)

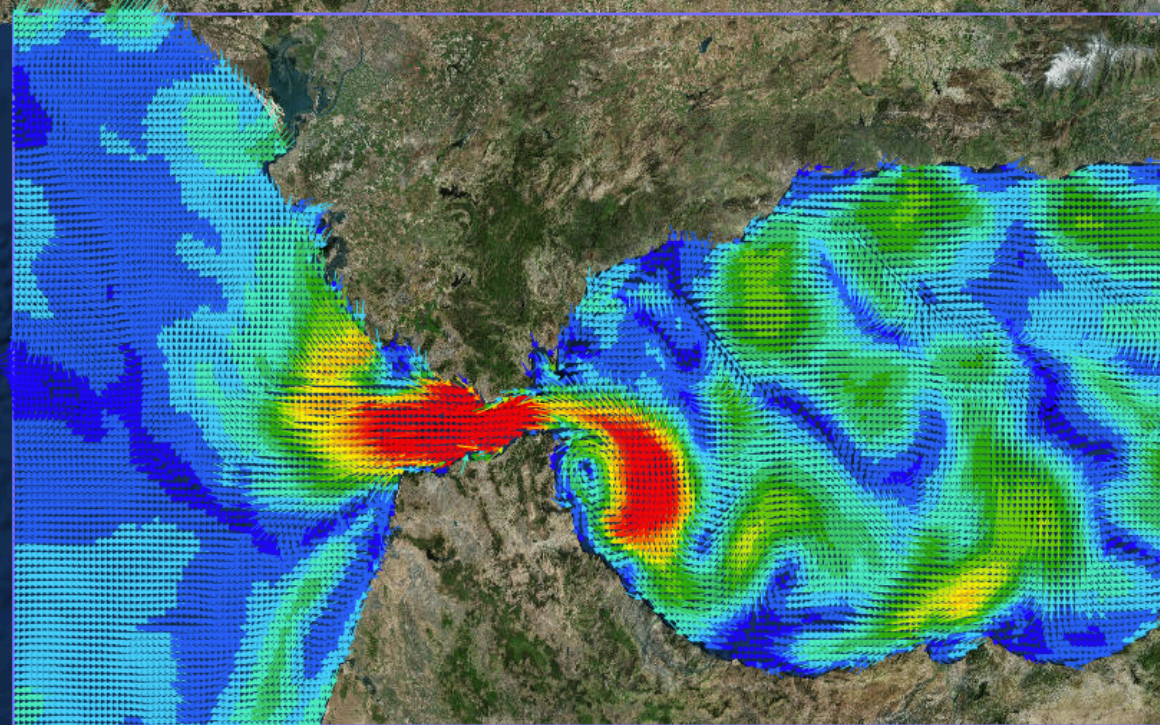
Search
model



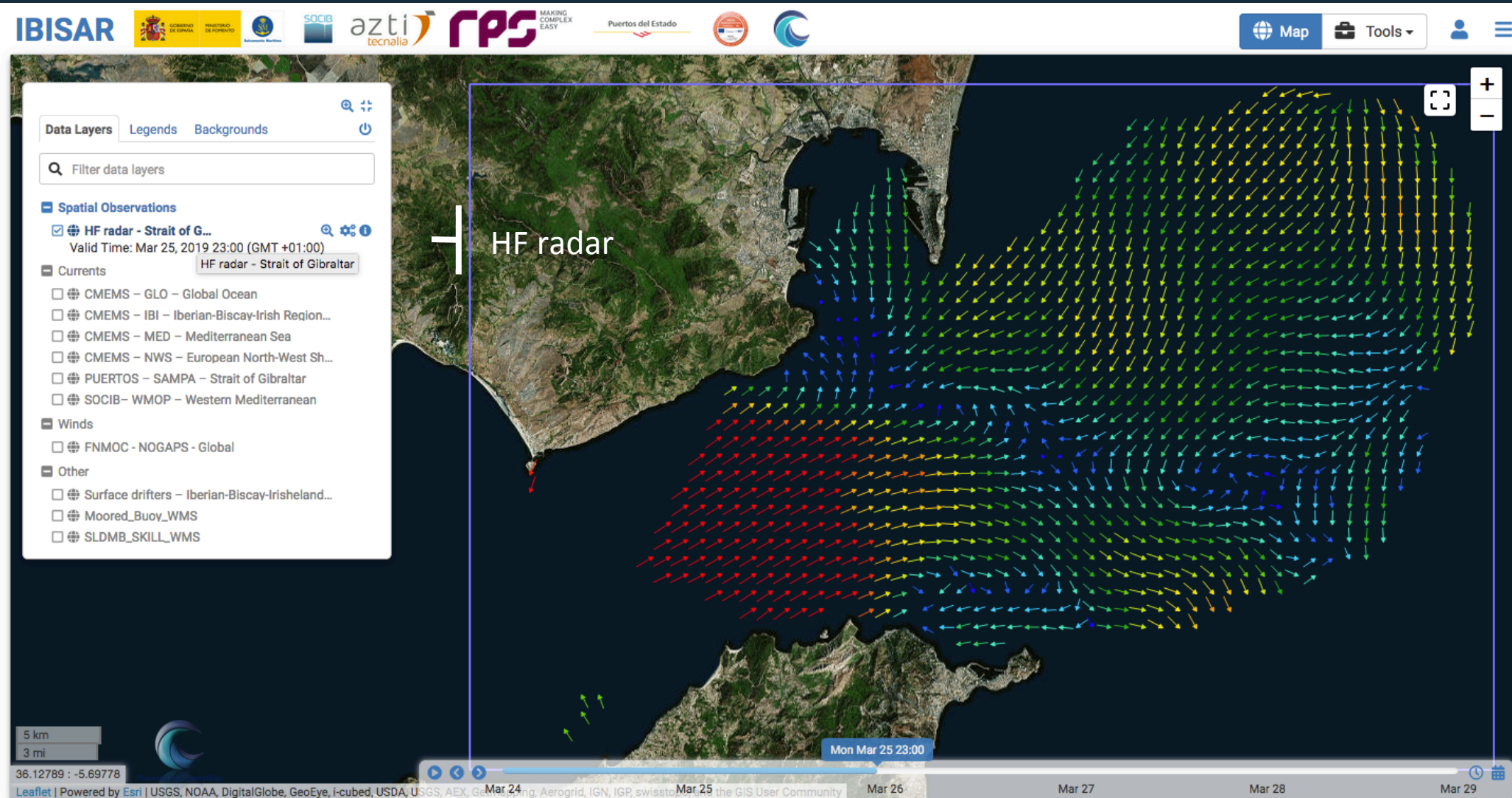
More info

Customize
appearance

Find on map



<http://jovellanos.oceansmap.com/IBISAR/#>



<http://jovellanos.oceansmap.com/IBISAR/#>

IBISAR



Data Layers Legends Backgrounds

Filter data layers

Spatial Observations

☒ HF radar - Strait of Gibraltar
Valid Time: Mar 25, 2019 23:00 (GMT +01:00)

Currents

- ☐ CMEMS - GLO - Global Ocean
- ☐ CMEMS - IBI - Iberian-Biscay-Irish Region...
- ☐ CMEMS - MED - Mediterranean Sea
- ☐ CMEMS - NWS - European North-West Sh...
- ☒ PUERTOS - SAMPA - Strait of Gibraltar
Valid Time: Mar 25, 2019 22:30 (GMT +01:00)
- ☐ SOCIB - WMOP - Western Mediterranean

Winds

- ☐ FNMOC - NOGAPS - Global

Other

HFR and
model
selected

Model
Intercomparison

Select a
point

Save the figure

Data Download and Export

- ☐ CSV Data
- ☐ PNG Image
- ☐ JPEG Image
- ☐ SVG Image
- ☐ PDF Image

Virtual Station @ 35.9658 °N 5.4444 °W
Mar 25, 2019 23:30 (GMT +01:00)

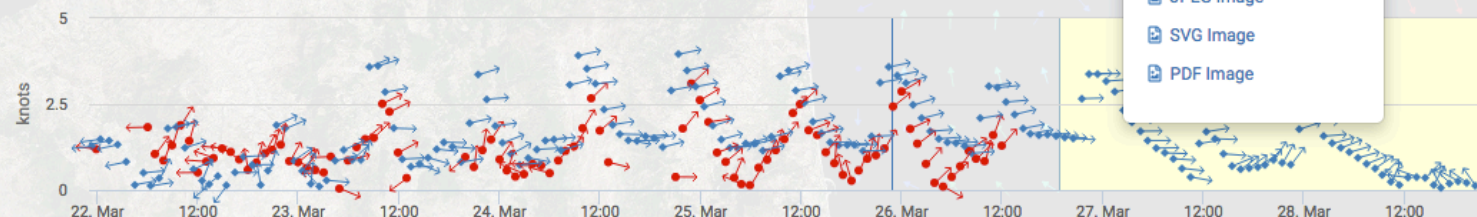
☒ Currents @ PUERTOS - SAMPA - Strait of Gibraltar

Mar 26, 2019 00:00 (GMT +01:00)

☒ Currents @ HF Radar - Strait of Gibraltar

78 °
3.33 knots
59.56 °
2.87 knots

Virtual Station @ 35.9658 N 5.4444 W



• Water Velocity @ HF Radar - Strait of Gibraltar • Water Velocity @ PUERTOS - SAMPA - Strait of Gibraltar

Available Layers



Inputs

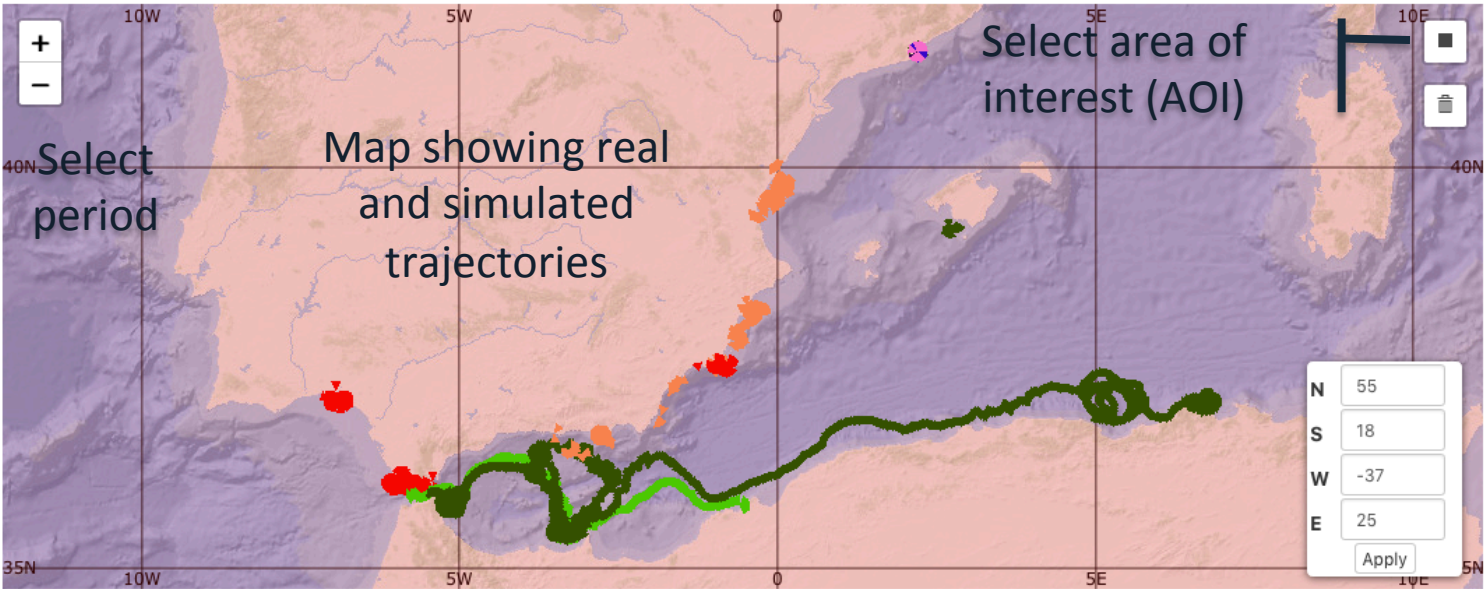


Select Date Range: (2014-09-01 / 2014-11-30)

Fetch Skill Scores: AOI: (18,000, -37,000) to (55,000, 25,000)

Display/Update Skill Scores

Legends



Average

Moored Buoys

SLDMBs

Reference sources

Target sources

Export to CSV

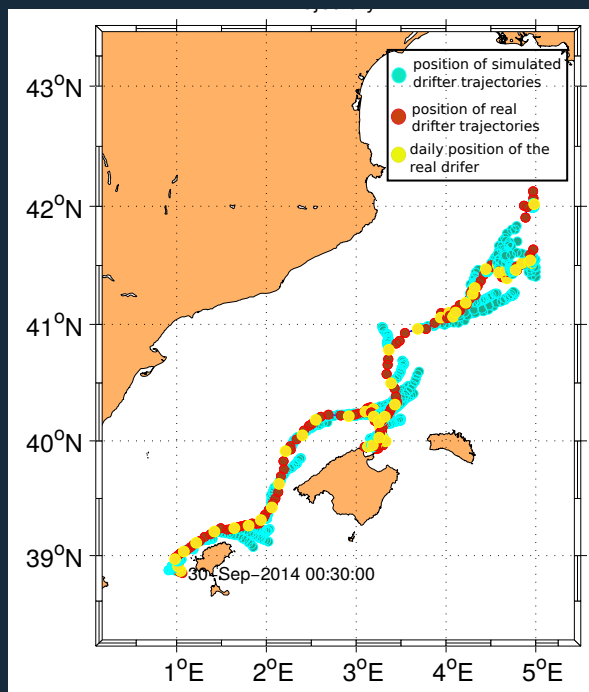
Download skill data

Display Skill Scores

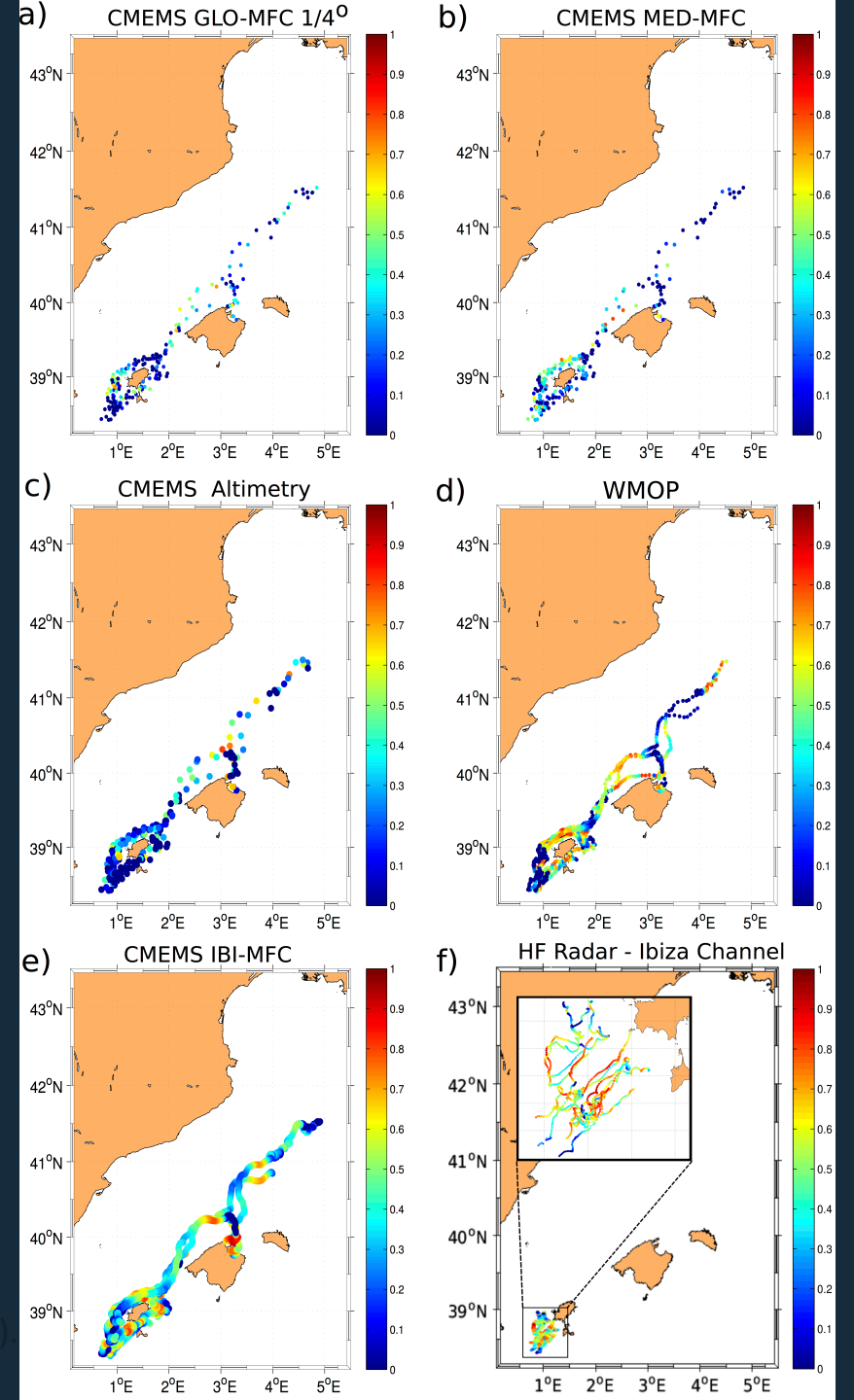
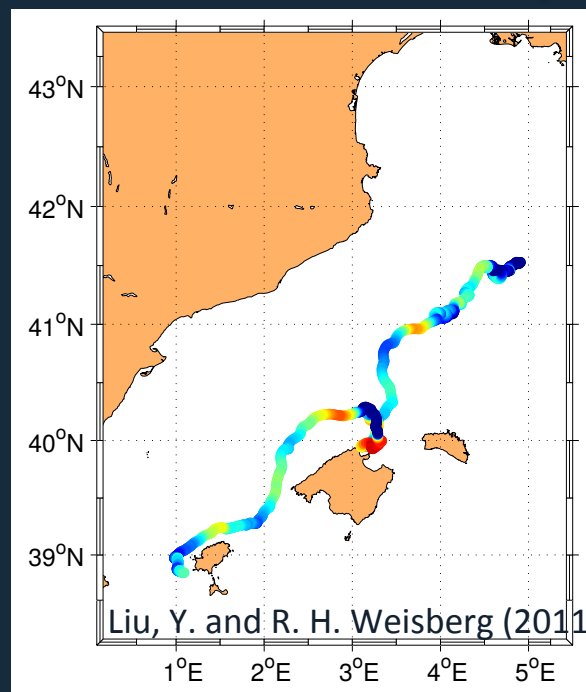
| Model | 6 Month | | | | | | Case | | | | | |
|--------------------|-------------|--------------|---------|-------------|--------------|---------|-------------|--------------|---------|-------------|--------------|---------|
| | SLDMB | | | Moored | | | SLDMB | | | Moored | | |
| | Skill Score | Num Buoys... | Num Obs | Skill Score | Num Buoys... | Num Obs | Skill Score | Num Buoys... | Num Obs | Skill Score | Num Buoys... | Num Obs |
| WMOP | 0.1586 | 5 | 6 | 0.344 | 2 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| MEDITERRAN_EAN_SEA | 0.0632 | 6 | 9 | 0.3057 | 2 | 34 | 0 | 0 | 0 | 0 | 0 | 0 |
| HYCOM_GLOBAL_NAVY | 0.1854 | 72 | 553 | 0.2826 | 4 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| HFRADAR_EB | 0 | 0 | 0 | 0.2064 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |

Spatial distribution of Skill Scores in WSMED (IBI sub-region)

CMEMS IBI MFC simulated vs. CODE drifter trajectories



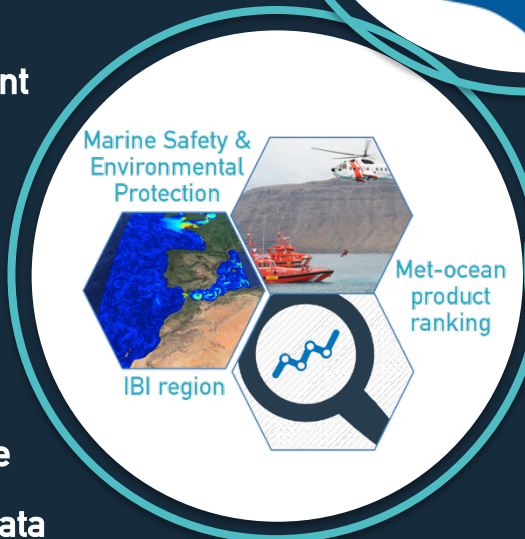
CMEMS IBI-MFC Skill Score (72 hours)



06 MUTUAL BENEFITS



- Closer contact with researchers & data providers
 - Improve SAR and pollution control operations
 - Minimize response time
 - Optimize search area planning
 - Allocate resources effectively



- Single access point
- Regularly updated database
- Easily interpretable metrics of accuracy
- Maximize data potential
- Improve data knowledge
 - NRT reliable data



- Reinforce user's loyalty
- Attract new communities
- More validation
- HFR data promotion
- New added-value products
- Respond to user's needs
- Intermediate user's feedback

ACKNOWLEDGEMENTS

Puertos del Estado



Spanish Port System



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DE ESPAÑA

MINISTERIO
DE FOMENTO



Salvamento Marítimo

Spanish Maritime Safety and Rescue Agency

euskoos



Operational Oceanography System of the Basque Country



COSMO Project (CSIC-ICM)



INCREASE (Copernicus Marine Service – Service Evolution)



IBISAR (Copernicus Marine Service – User Uptake)



Copernicus Marine Service – INSTAC –phase2



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Salvamento Marítimo

Puertos del Estado

SOCIB

Balearic Islands
Coastal Observing
and Forecasting
System

THANKS FOR YOUR ATTENTION



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