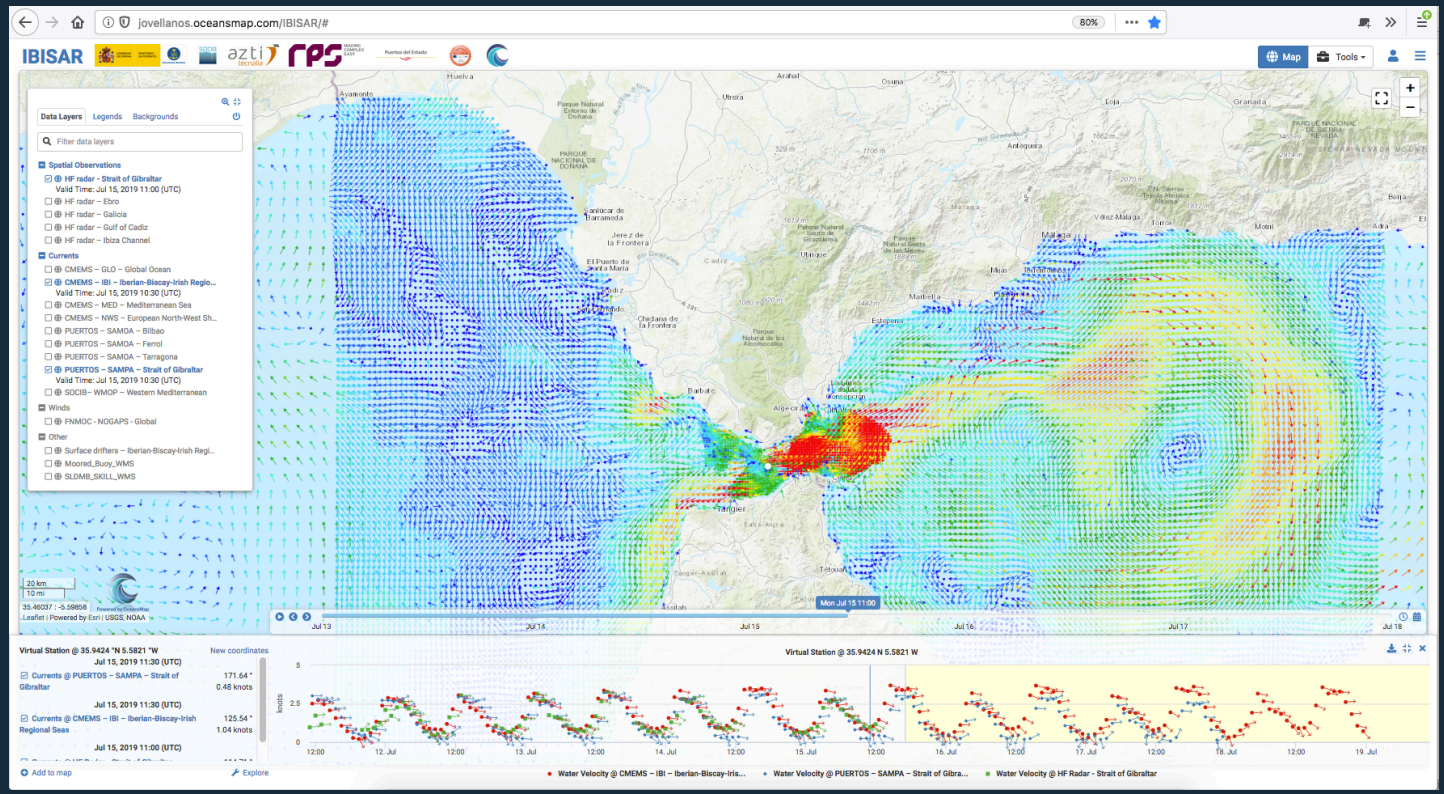
SOCIB Balearic Islands Coastal Observing and Forecasting System

CMEMS DEMONSTRATION COASTAL – IBI
IBISAR
Contract 67-DEM4-L7
Until 31 March 2021

IBISAR downstream service: Unlocking HF radar data potential for maritime safety and environmental applications



Emma Reyes *(on behalf of the IBISAR team)*

ereyes@socib.es

EUROGOOS HFR TASK TEAM WORKSHOP
13-14.NOVEMBER. 2019, SAN SEBASTIAN

www.socib.es

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OUTLINE

02 IBISAR SERVICE OVERVIEW

How can we improve emergency response at sea?

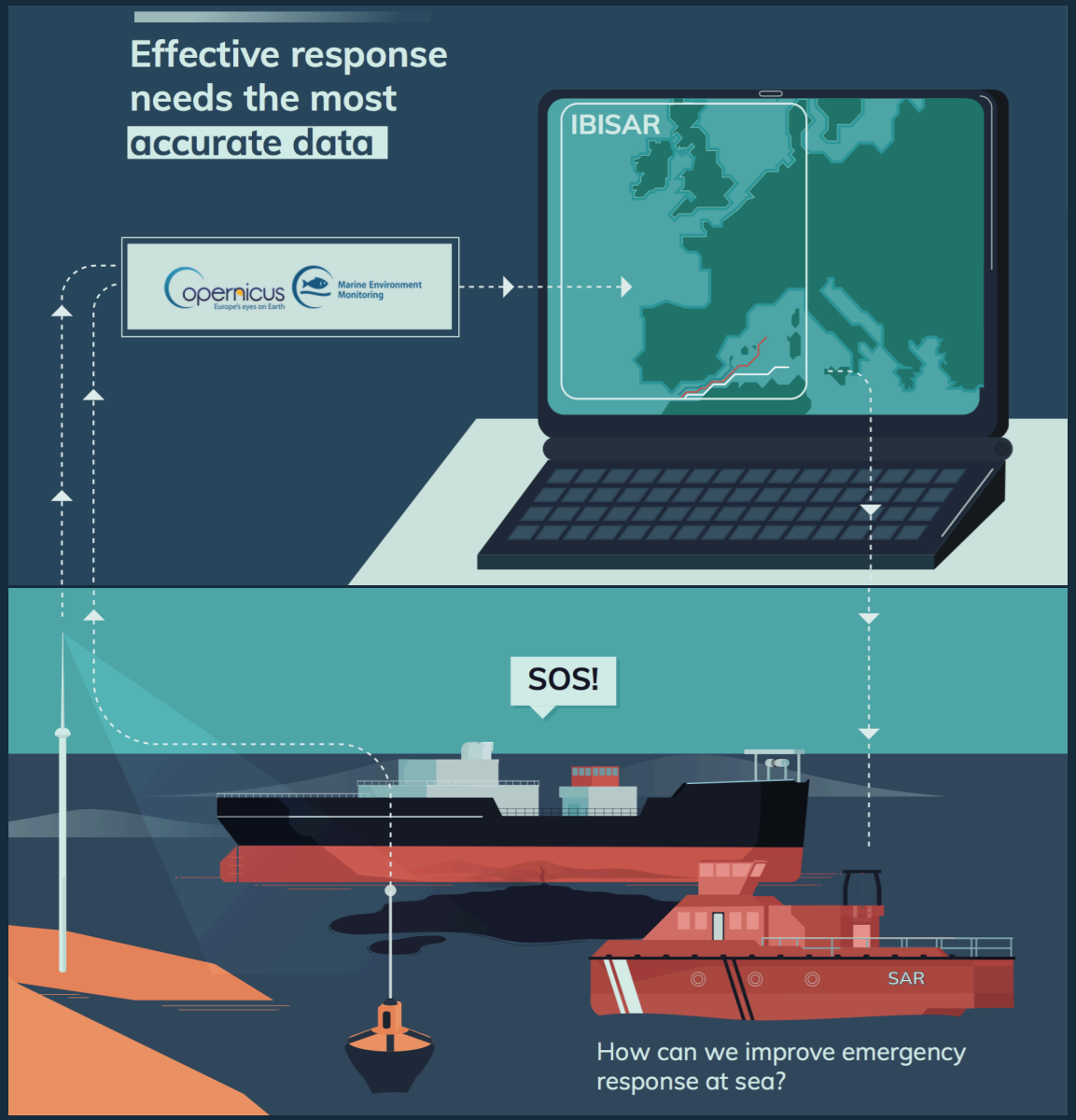
End-users needs

Reliable current observations and forecasting are essential

Easily interpretable **metrics**

User-friendly automated skill **assessment**

02 IBISAR SERVICE OVERVIEW



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

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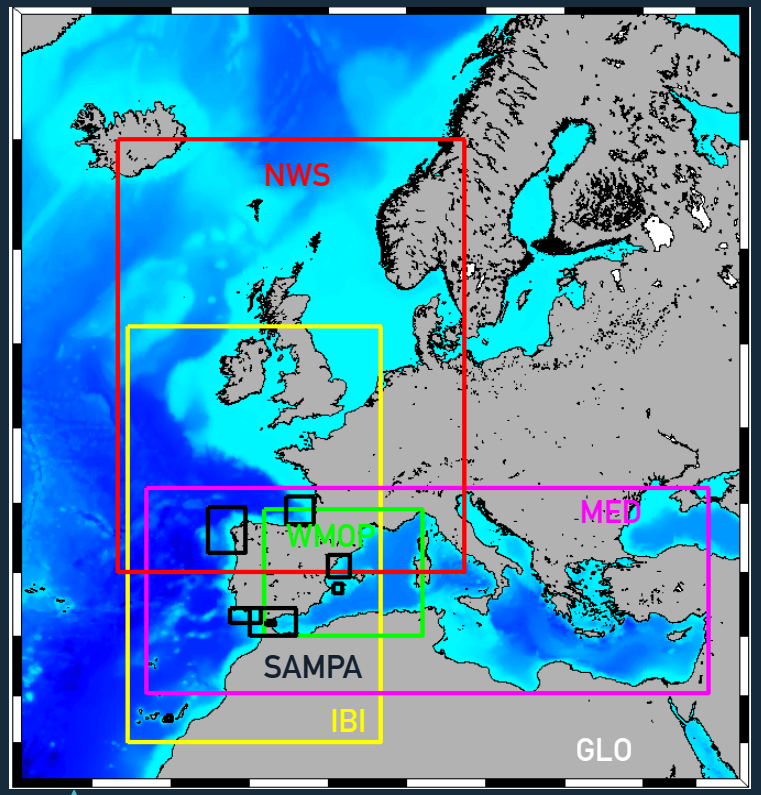
04 IBISAR: DATA USED

Ocean models

What? Current forecast

How? Target sources

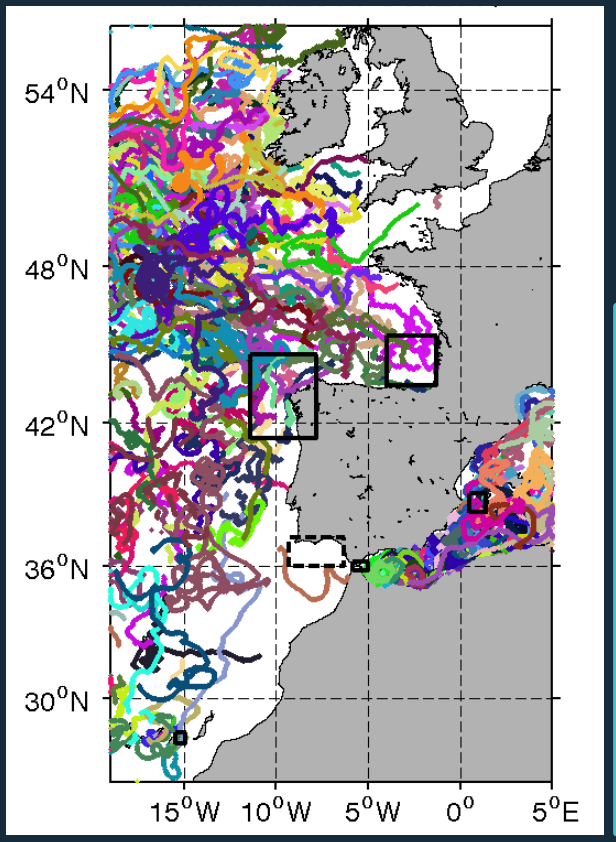


Ocean current forecast

In-Situ Data

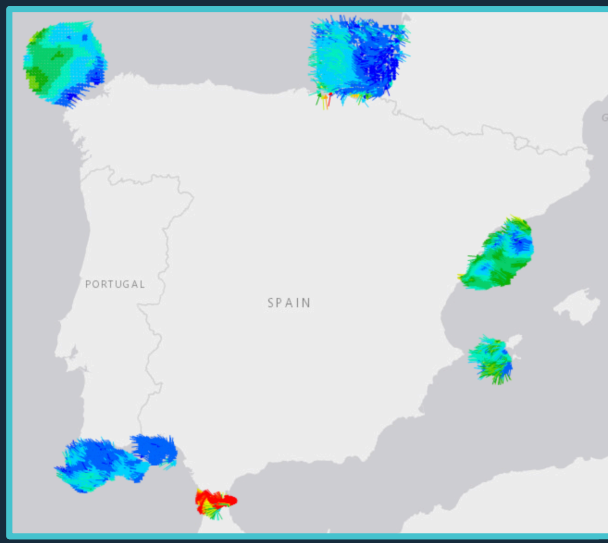
What? Current surface observations

How? Reference source



Drifter trajectories

HFR surface currents



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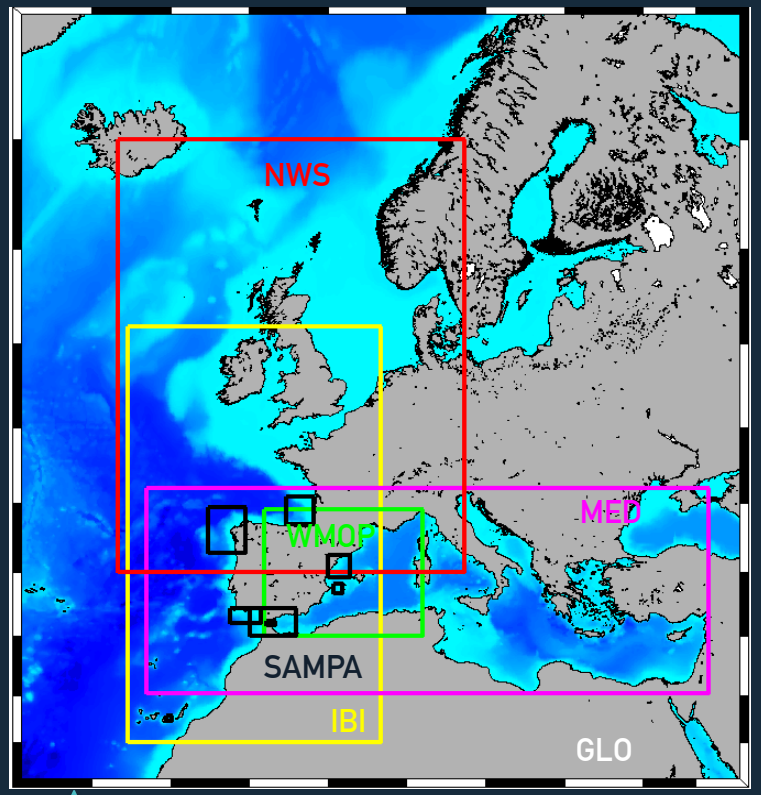

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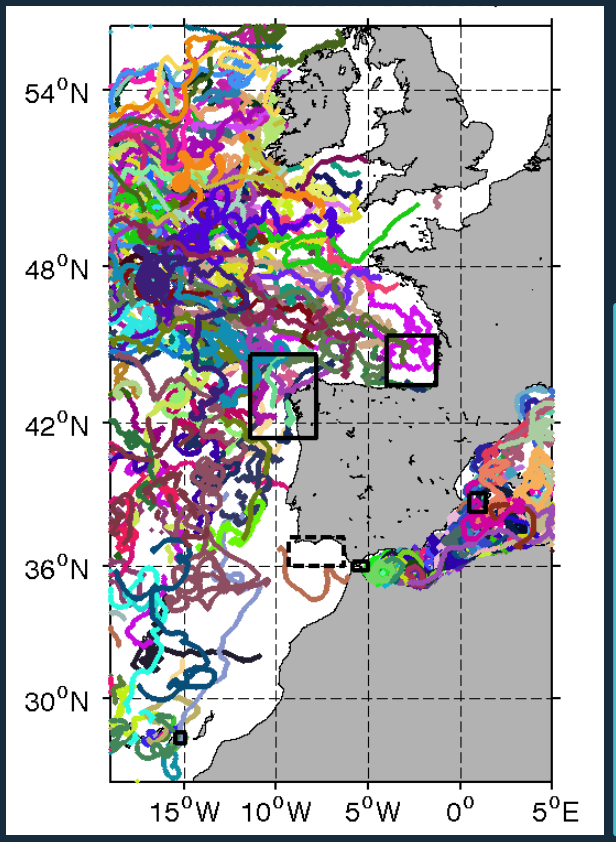

Drifter trajectories

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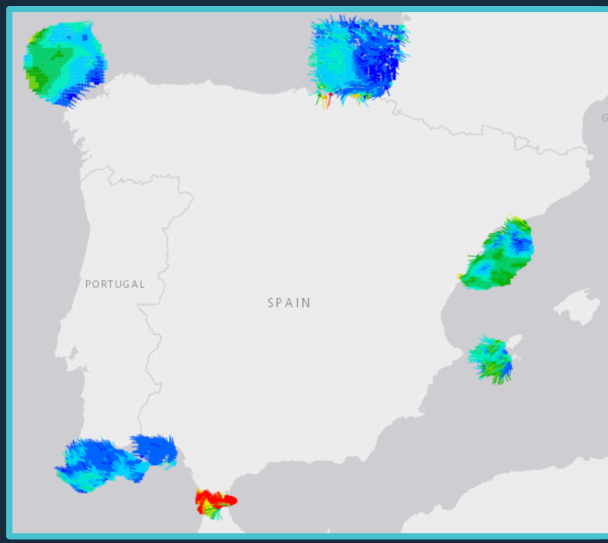


Which model should I select?

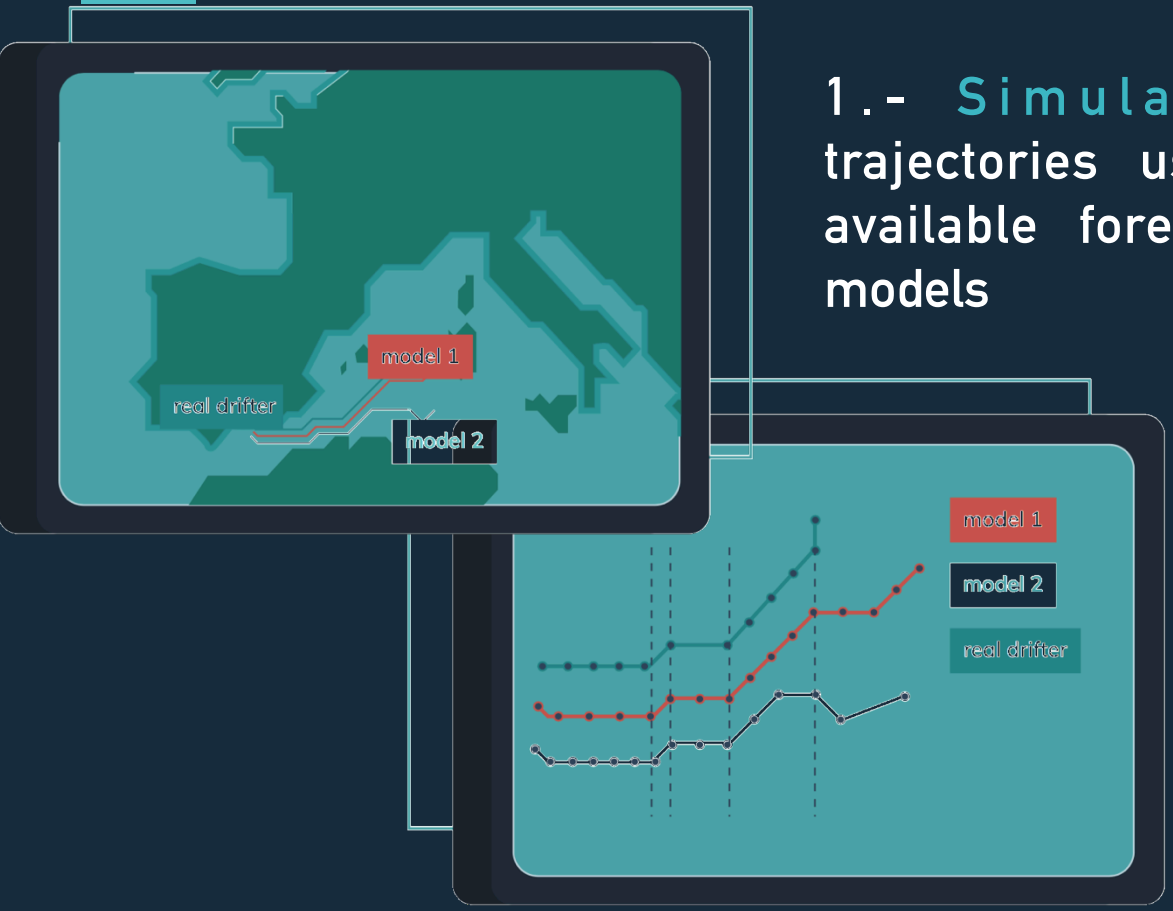
Lack in coastal areas

50% SAR cases: 4 km offshore

03 IBISAR: HOW IT WORKS?

1.- Simulates trajectories using available forecast models

03 IBISAR: HOW IT WORKS?



1.- Simulates trajectories using available forecast models

2.- Compares simulated trajectories vs. real drifters

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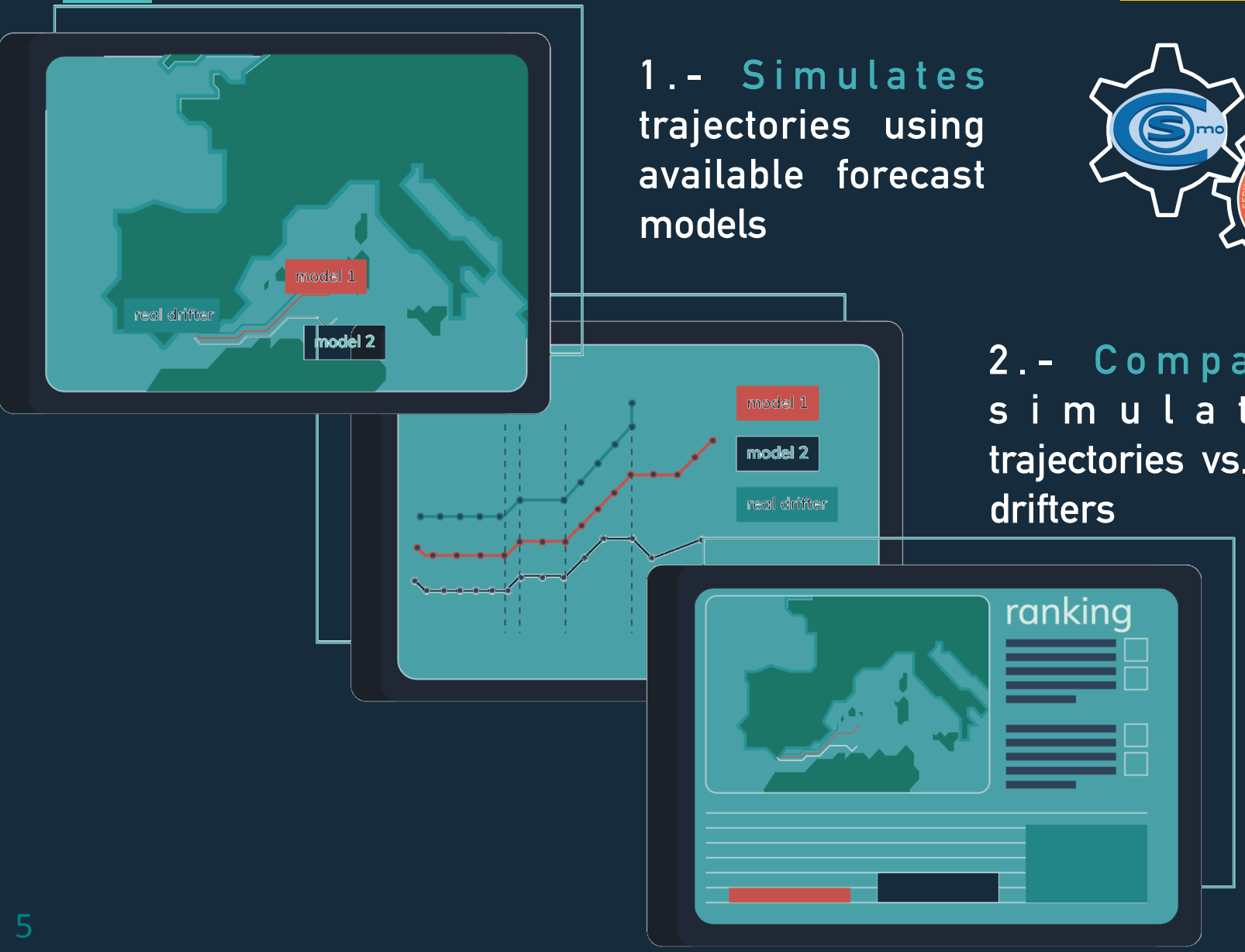

1.- Simulates trajectories using available forecast models

2.- Compares simulated trajectories vs. real drifters

3.- Ranks models based on their performance

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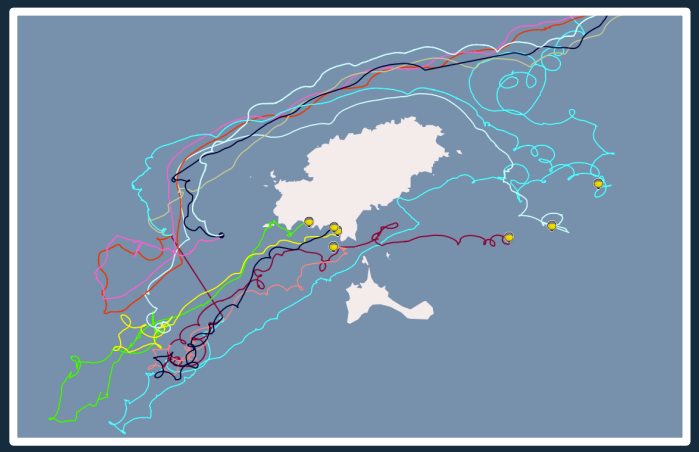
04 RESULTS: IBIZA CHANNEL

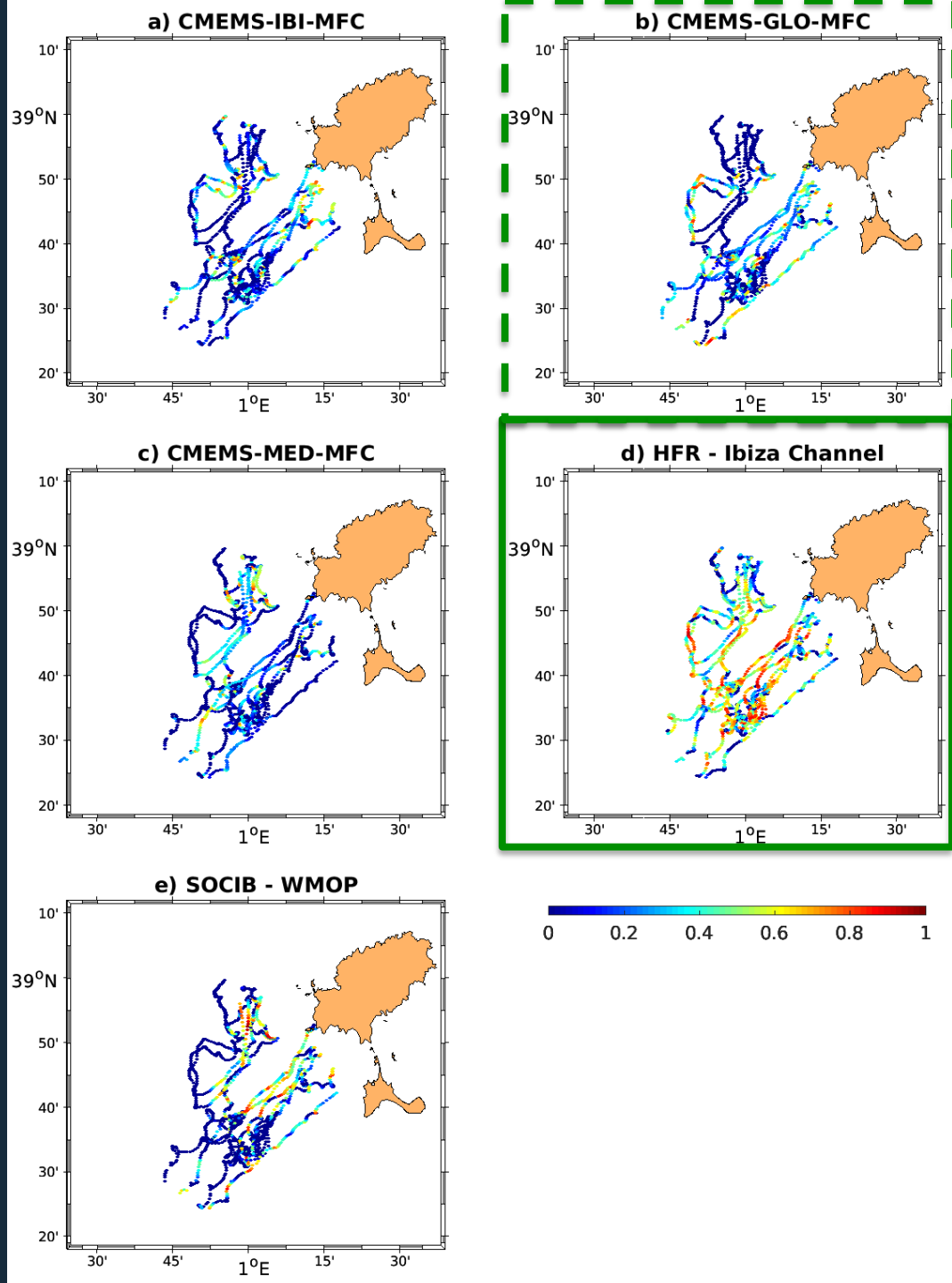
30 Sep-10 Oct 2014

- 13 drifter buoys
- 4 Ocean models:
  - 3 CMEMS models (IBI, MED, GLOBAL)
  - 1 regional model (WMOP)
- HFR Ibiza Channel



Lana et al. (2016)

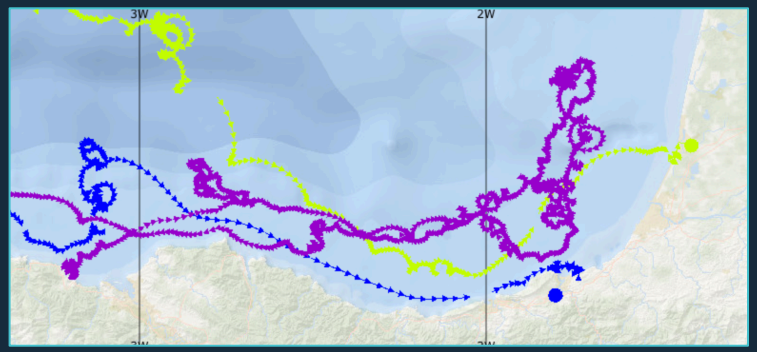
Spatial distribution of Skill Scores of models and HFR in the Ibiza Channel



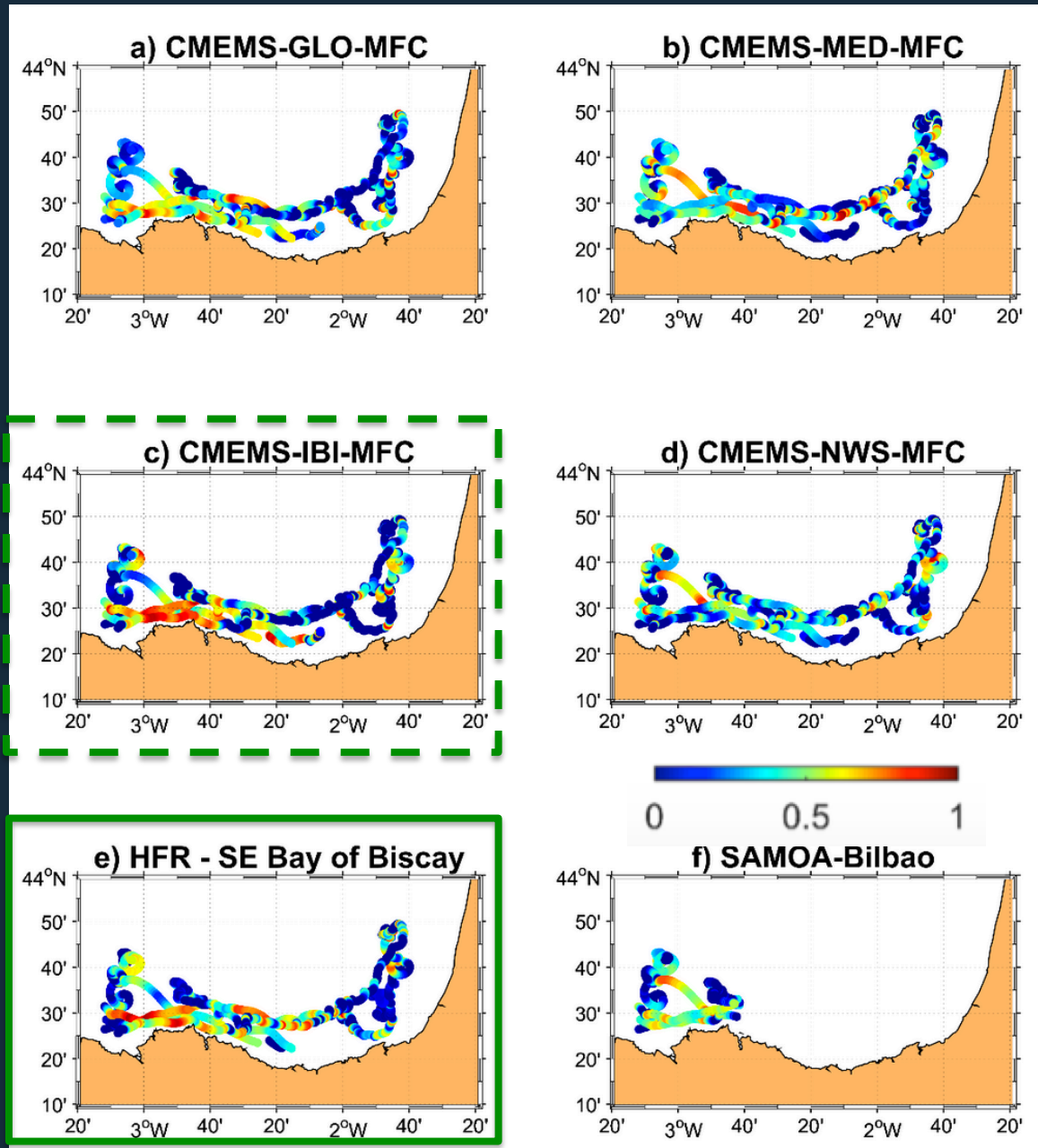
04 RESULTS: BAY OF BISCAY

17-19 Sep 2018
12-14 Feb 2019

- 5 drifter buoys: CMEMS & SASEMAR
- 5 Ocean models:
  - 4 CMEMS models (IBI, MED, GLOBAL, NWS)
  - 1 regional model (SAMOA-BIL)
- HFR Bay of Biscay (BoB)



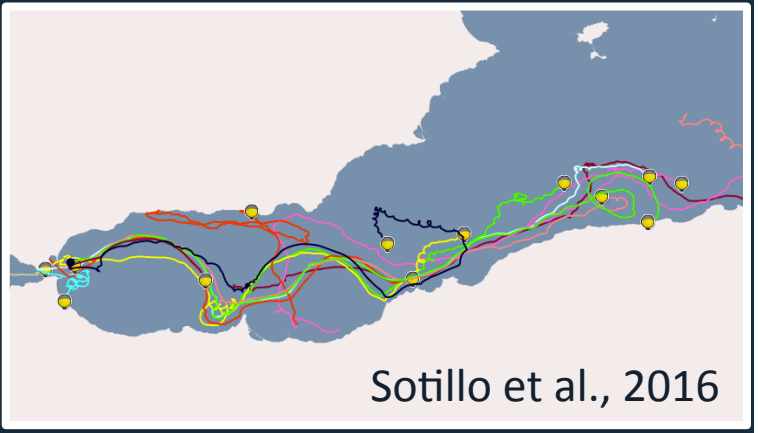
Spatial distribution of Skill Scores of models and HFR in the BoB



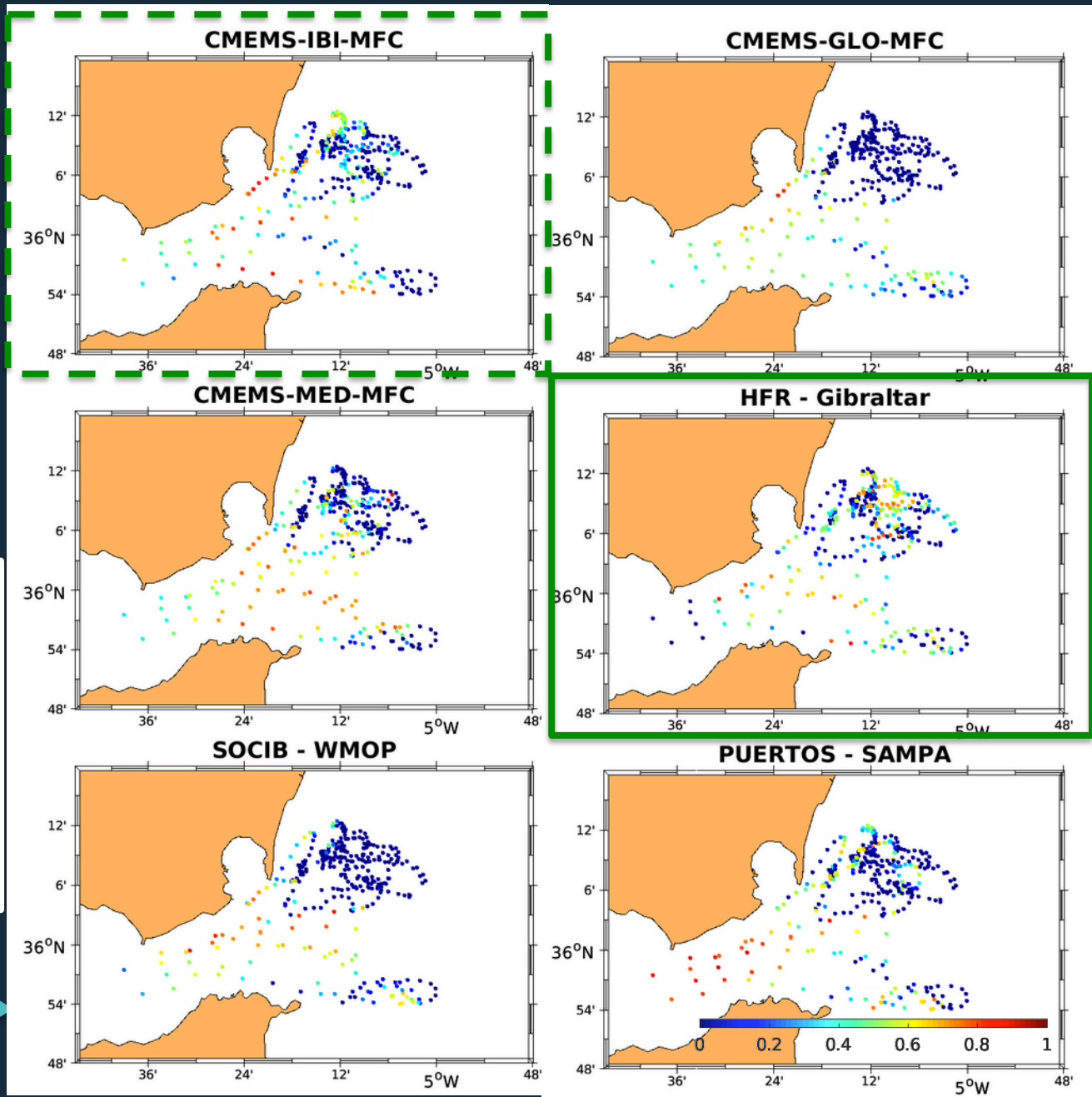
04 RESULTS: GALICIA

9-13 Sep 2014

- 20 drifter buoys: MEDESS-GIB
- 5 Ocean models:
  - 3 CMEMS models (IBI, MED, GLOBAL)
  - 2 regional models (SOCIB-WMOP, PUERTOS-SAMPA)
- HFR Strait of Gibraltar (SoG)



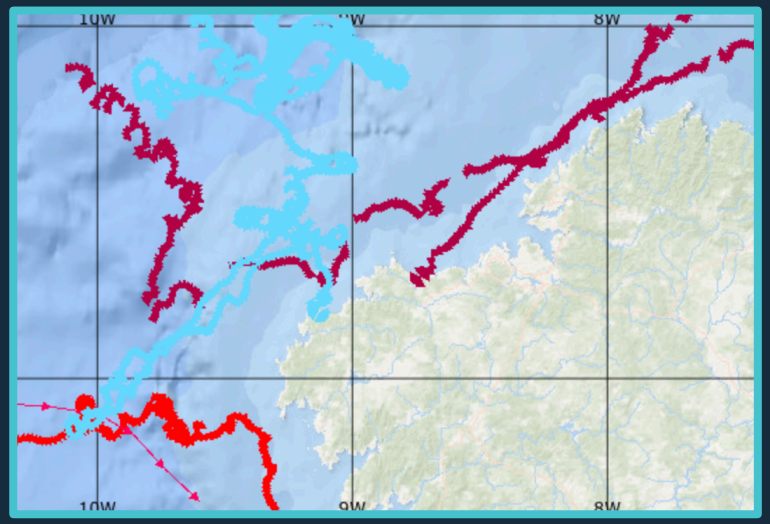
Spatial distribution of Skill Scores of models and HFR in the SoG



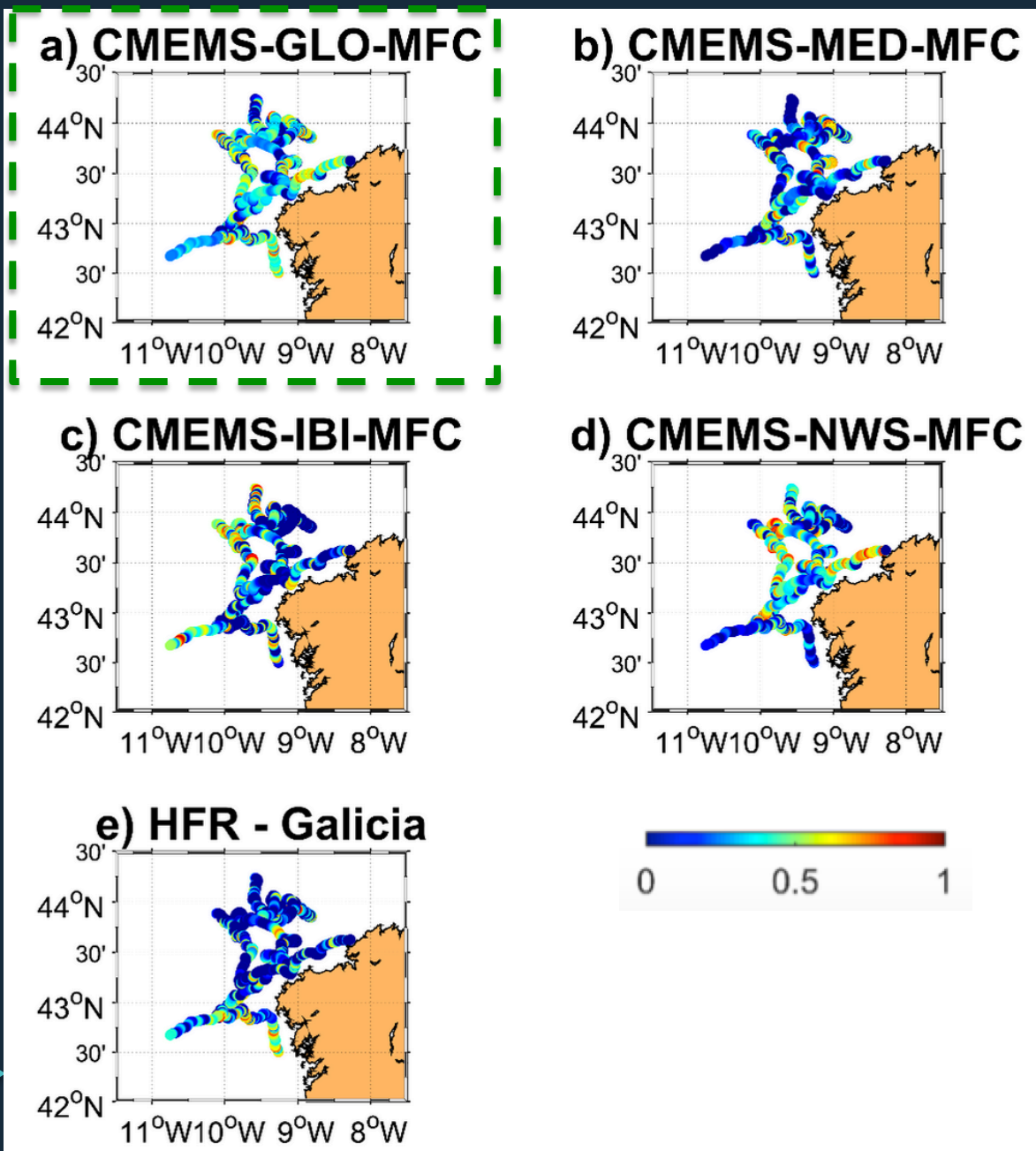
04 RESULTS: GALICIA

2018 and 2019

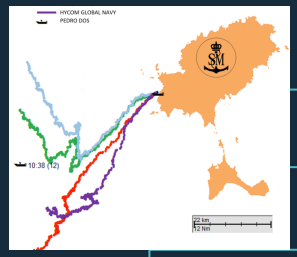
- 3 drifter buoys: CMEMS
- 5 Ocean models:
  - 4 CMEMS models (IBI, MED, GLOBAL, NWS)
- HFR Galicia



Spatial distribution of Skill Scores of models and HFR in Galicia

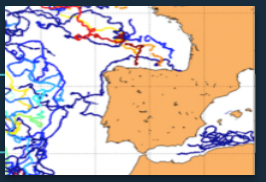


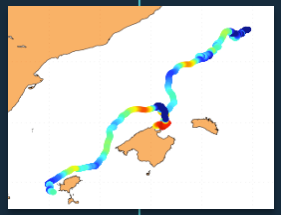
05 CONCLUSIONS



SAR Operators needs data confidence

Lack of drifters in coastal prone-risk areas





SA results in the pilot areas

- GLO model is able to reproduce the intense mesoscale activity
- Downscaling in needed to reproduce submesoscale patterns
- Skill Score is strongly region-dependant and scenario-specific
- HFR offers the highest performance in most scenarios
- HFR performance decreases in the baseline and domain outer-edges

HFR simulated trajectories for backtracking and forecast

- operational gap-filled HFR currents needed
- short-term predictions needed

IBISAR complements the decision-support tools

* User-friendly service
* Improve SAR and pollution control operations

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ACKNOWLEDGEMENTS

Puertos del Estado

Spanish Port System

GOBIERNO DE ESPAÑA | MINISTERIO DE FOMENTO | Salvamento Marítimo

Spanish Maritime Safety and Rescue Agency

COSMO Project (CSIC-ICM)

INCREASE (Copernicus Marine Service – Service Evolution)

IBISAR (Copernicus Marine Service – User Uptake)

Copernicus Marine Service – INSTAC –phase2

The principal authors of HFR_Progs_2_1_2: David Kaplan (UCSC), Mike Cook (NPS) and Dan Atwater (UCSC/NPS).

THANKS FOR YOUR ATTENTION

SOCIB Balearic Islands Coastal Observing and Forecasting System