



MyOcean V1 stream2 (June 2011)  
coordinated validation in IBI

**IBI-ROOS Meeting 16-17 February 2011, Exeter**



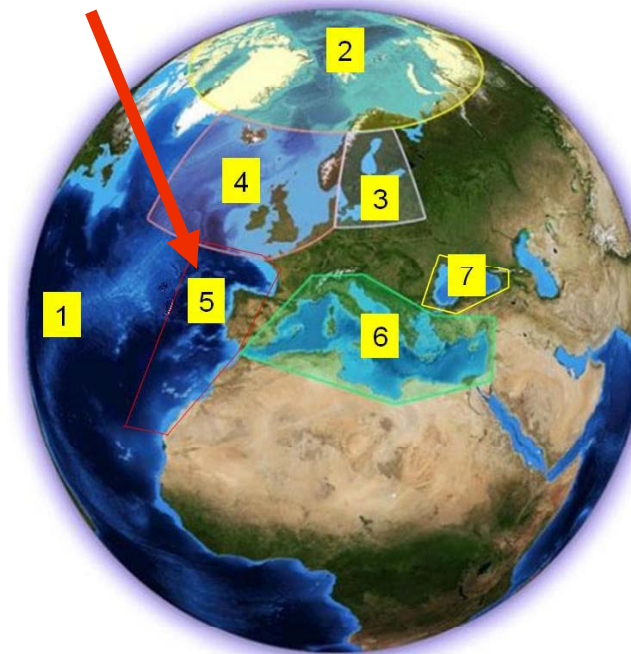


## Objectives

To organize the validation of MyOcean V1 stream2 (June 2011) in a coordinated way in IBI area with *Intermediate Users* perspectives

Based on:

- Available Observing Systems
- The main known processes along the IBI *shelf/slope*
- An integrated point of view (instead of studying the processes locally)

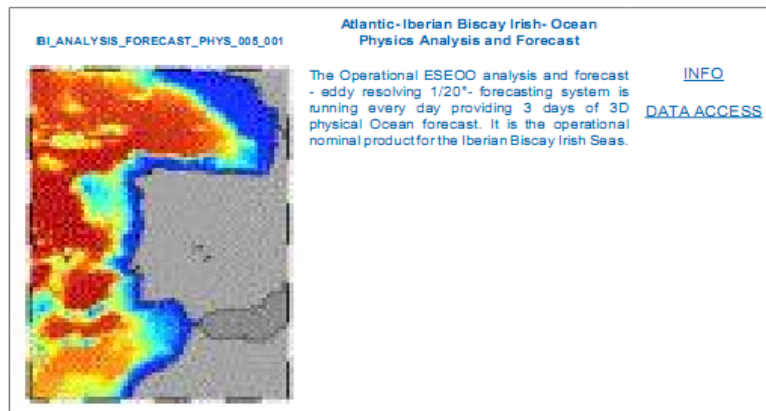


- 1. Global
- 2. Arctic
- 3. Baltic
- 4. NWS
- 5. IBI
- 6. Med Sea
- 7. Black Sea



# Previous work

## Atlantic- Iberian Biscay Irish- Ocean



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Mercator Ocean Quarterly Newsletter

#39 – October 2010 – Page 5

The new regional generation of Mercator Ocean system in the Iberian Biscay Irish (IBI) area

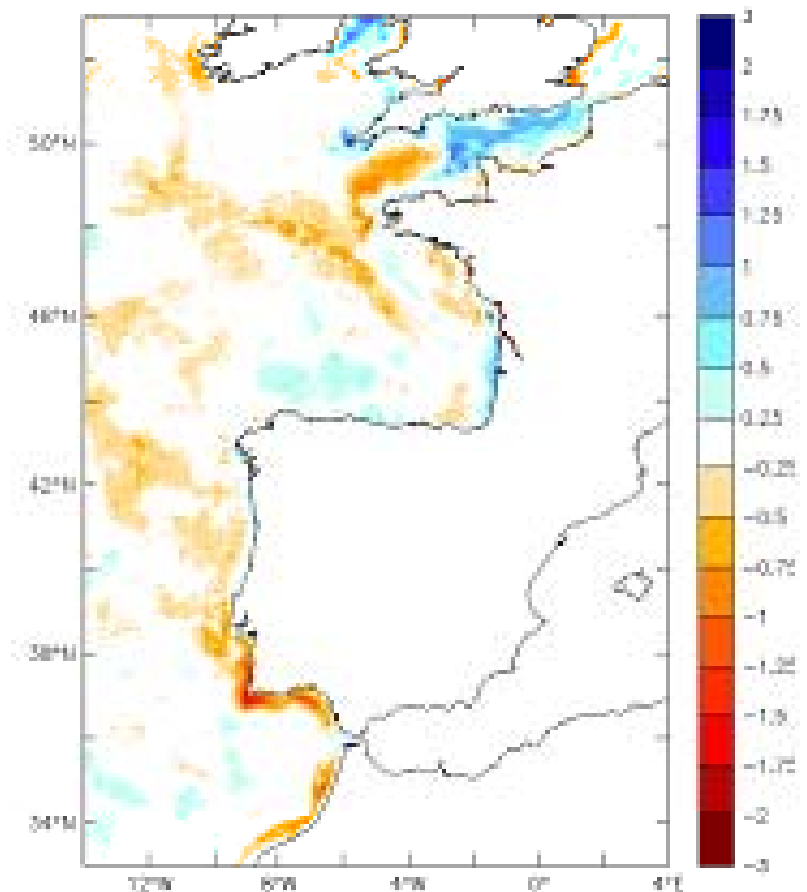
## The new regional generation of Mercator Ocean system in the Iberian Biscay Irish (IBI) area

By Sylvain Cailleau<sup>1</sup>, Jérôme Chanut<sup>1</sup>, Bruno Levier<sup>1</sup>, Claire Maraldi<sup>2</sup>, Guillaume Refray<sup>1</sup>

<sup>1</sup> Mercator Ocean, Toulouse, France

<sup>2</sup> LEGOS, Toulouse, France

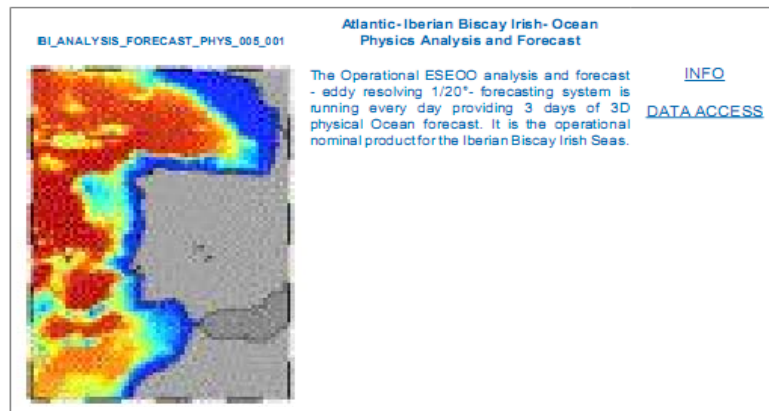
## RMS (obs-model) SST difference (°C) May-June 2009. IBI simulation





# Previous work

## Atlantic- Iberian Biscay Irish- Ocean



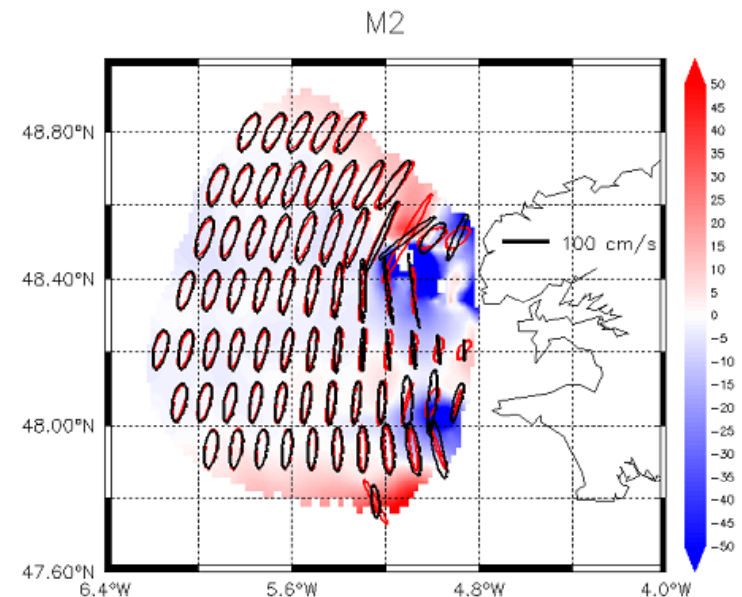
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**RMS OBS-MODEL (cm/s) zonal/meridional currents at 3 m. May-June 2009.**

	IBI
Cabo Penas	7/7
Cabo Silleiro	5/9
Estaca bares	9/5
Villano Sisargas	11/9

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**Modeled (black) observed (red ellipses) M2 tidal ellipses**







# Process- oriented validation

Answer state-of-the-art questions from an integrated point of view:

- ✓ Spatial and temporal variability of shelf/slope surface currents and wind-current interactions (scientific and operational interests)
- ✓ Contribution of the IPC to the surface transport, spatial and temporal variability
- ✓ Contribution of processes as tides and vertical motions and other (local forcings/processes) to the shelf/slope circulation

## Main Processes:

Wind induced current

Slope current

Tides, internal waves, upwelling

## Other (local) processes

River plumes dynamics, ...



# Observing Systems



HF radars (operational/  
soon operational)

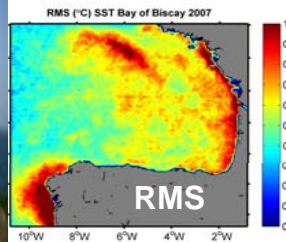


Offshore buoys (currents  
and local winds).

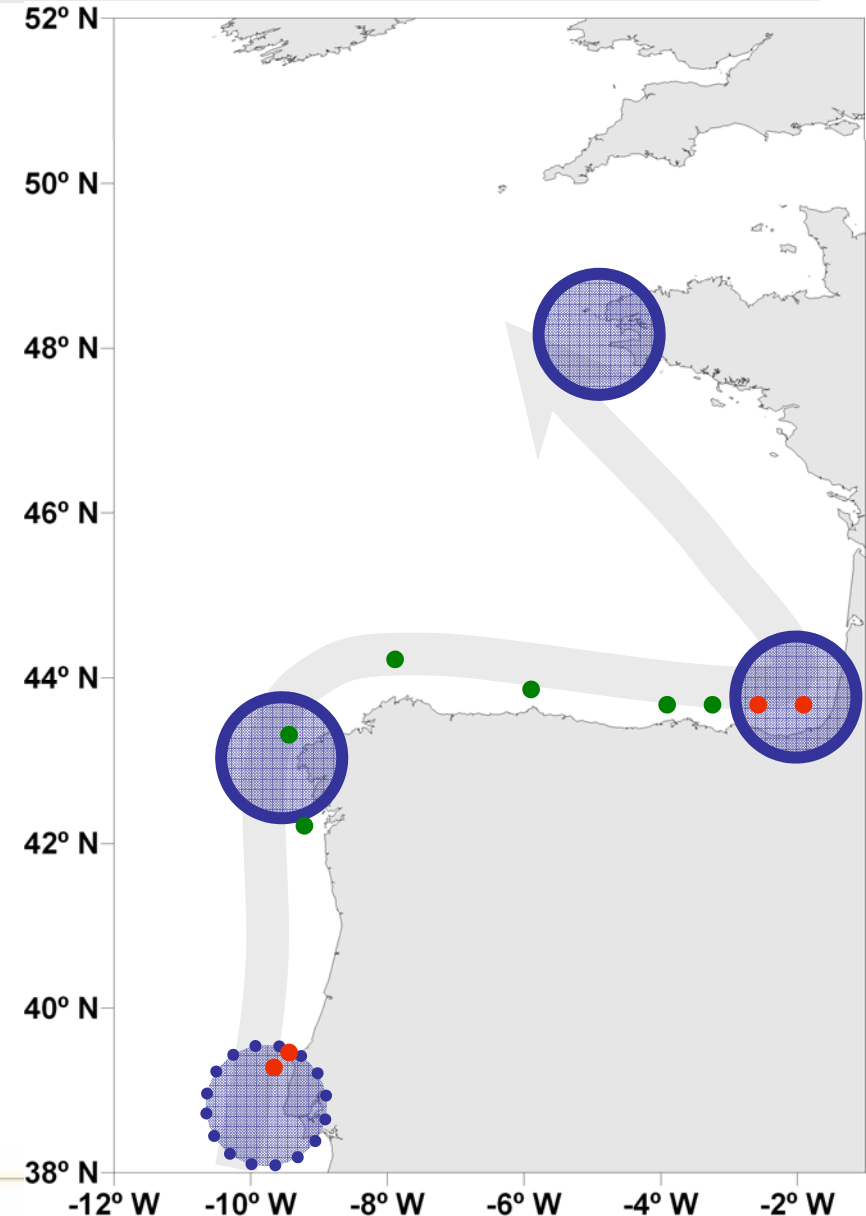


Offshore buoys (currents and  
local winds) + vertical  
information

And also: Repeat CTD transects,  
SST, ocean color, wind data from  
reanalysis...



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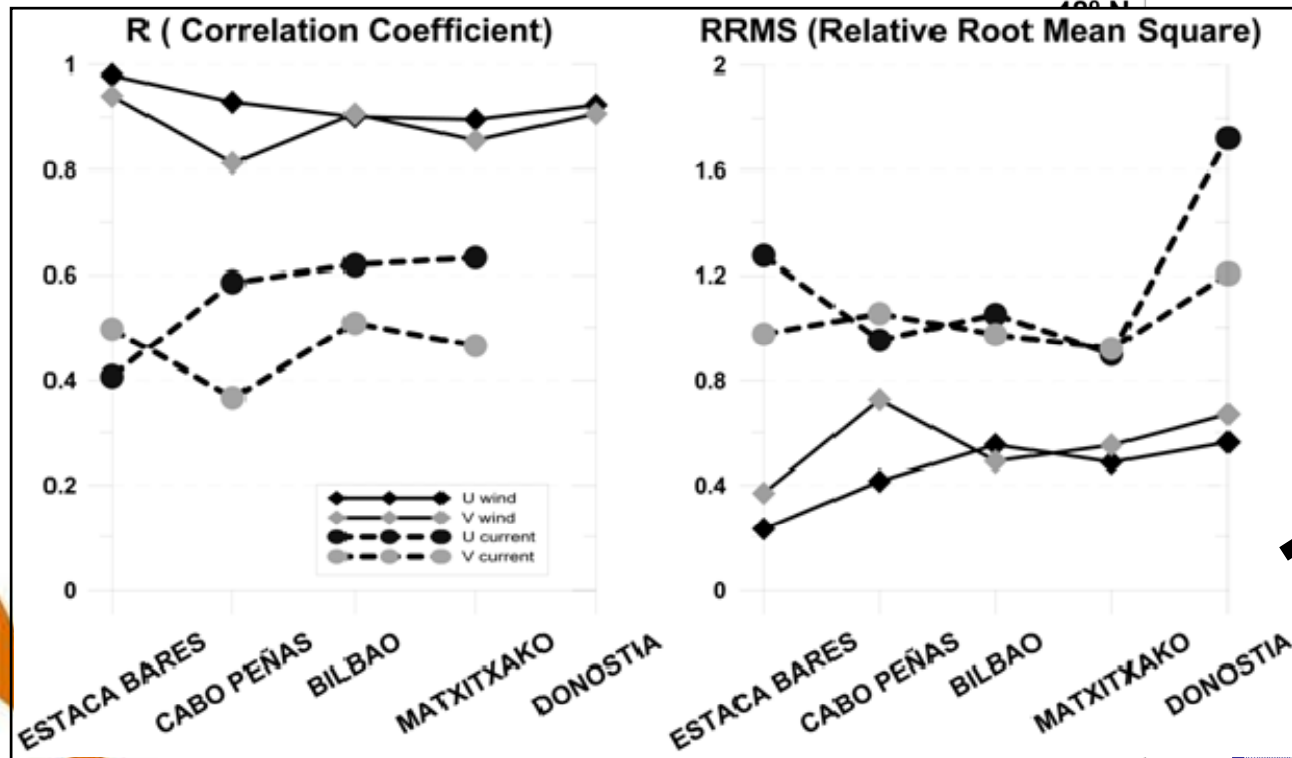




# Surface currents and wind-current interactions

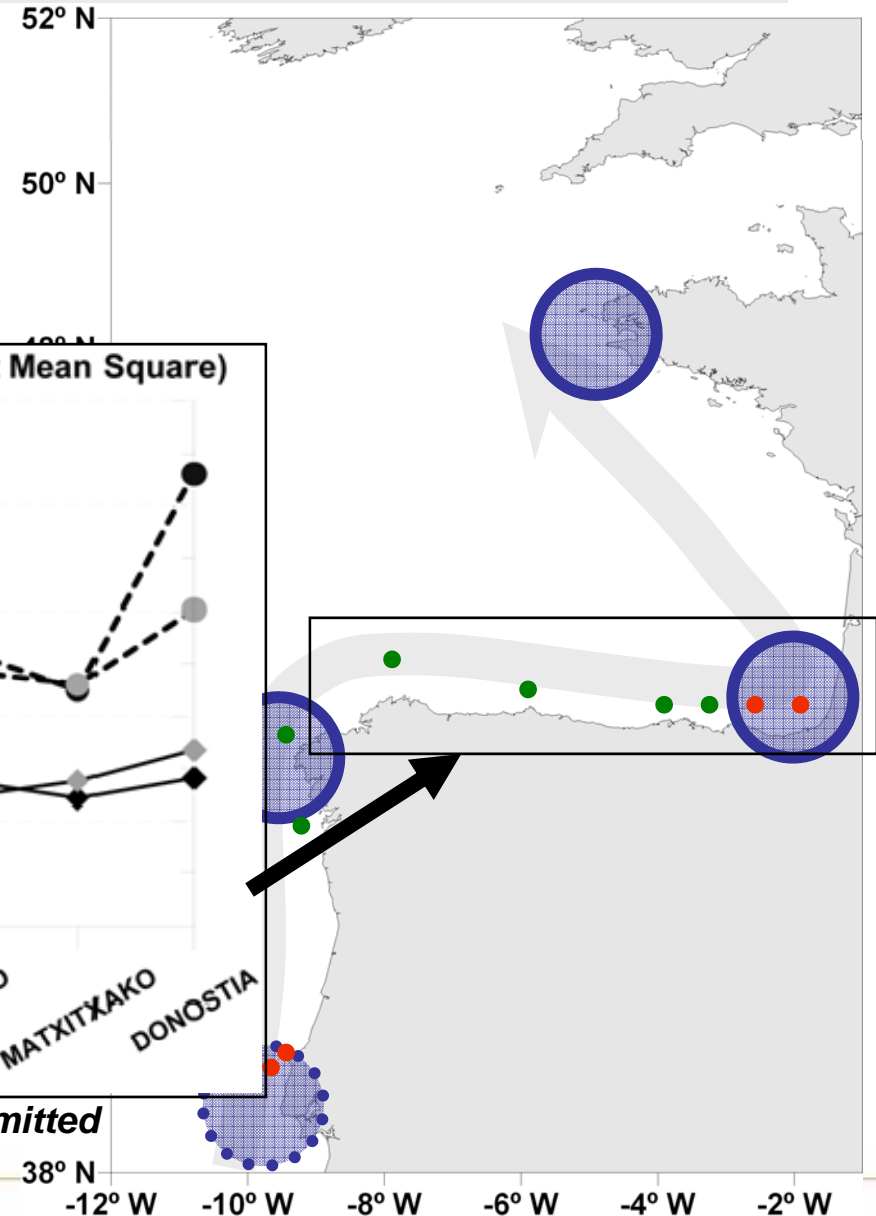
Main questions:

## ➤ Winds and surface currents



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Alzorriz et al. 2011 submitted



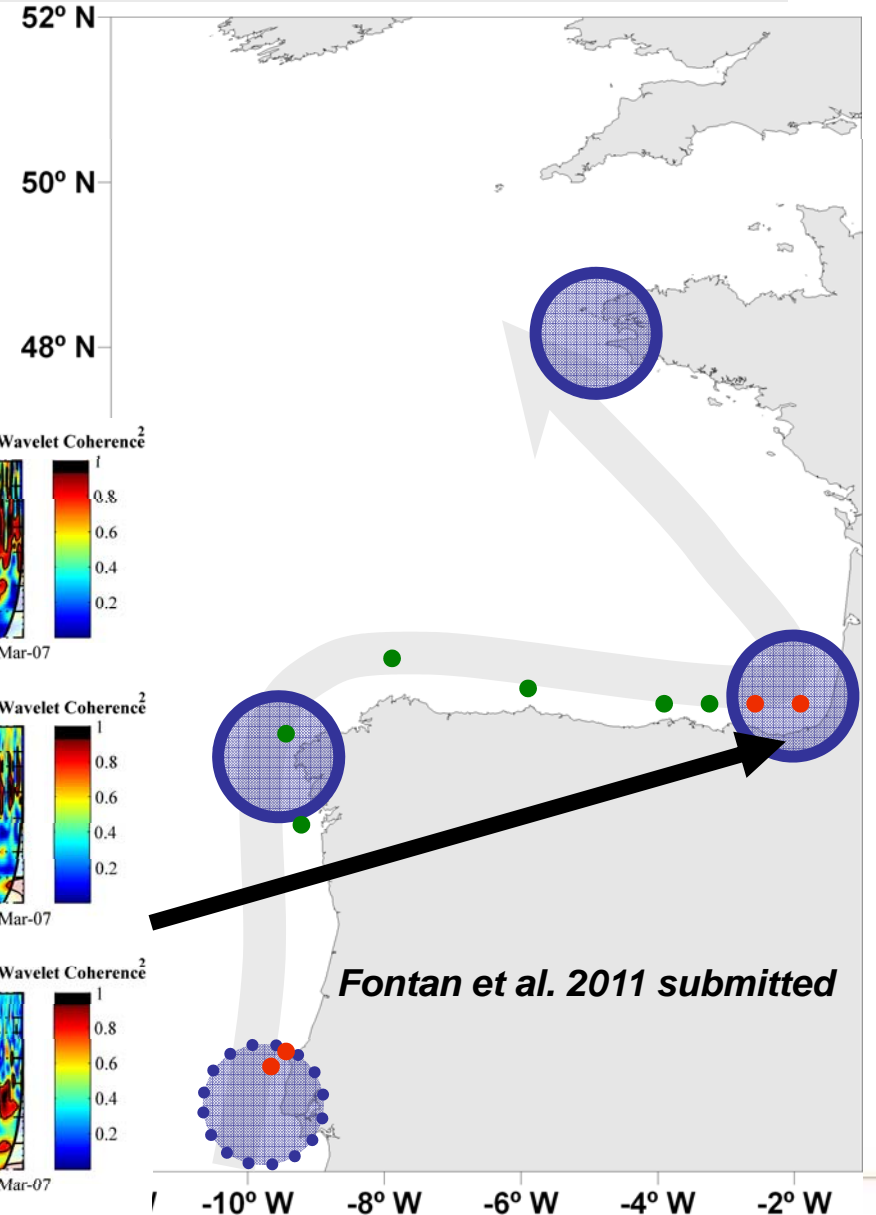
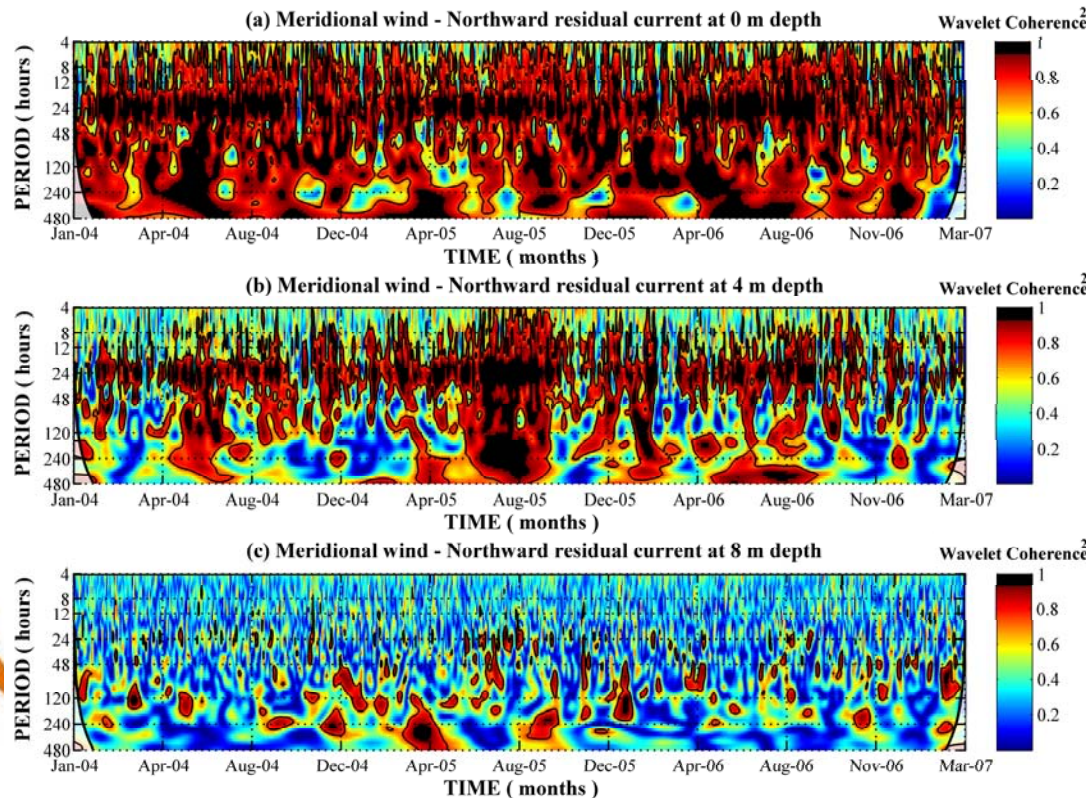




# Surface currents and wind-current interactions

Main questions:

- Winds and surface currents
- **Wind-current interactions at different scales (and depths)**







# Surface currents and wind-current interactions

Main questions:

- Winds and surface currents
- Wind-current interactions at different scales (and depths)

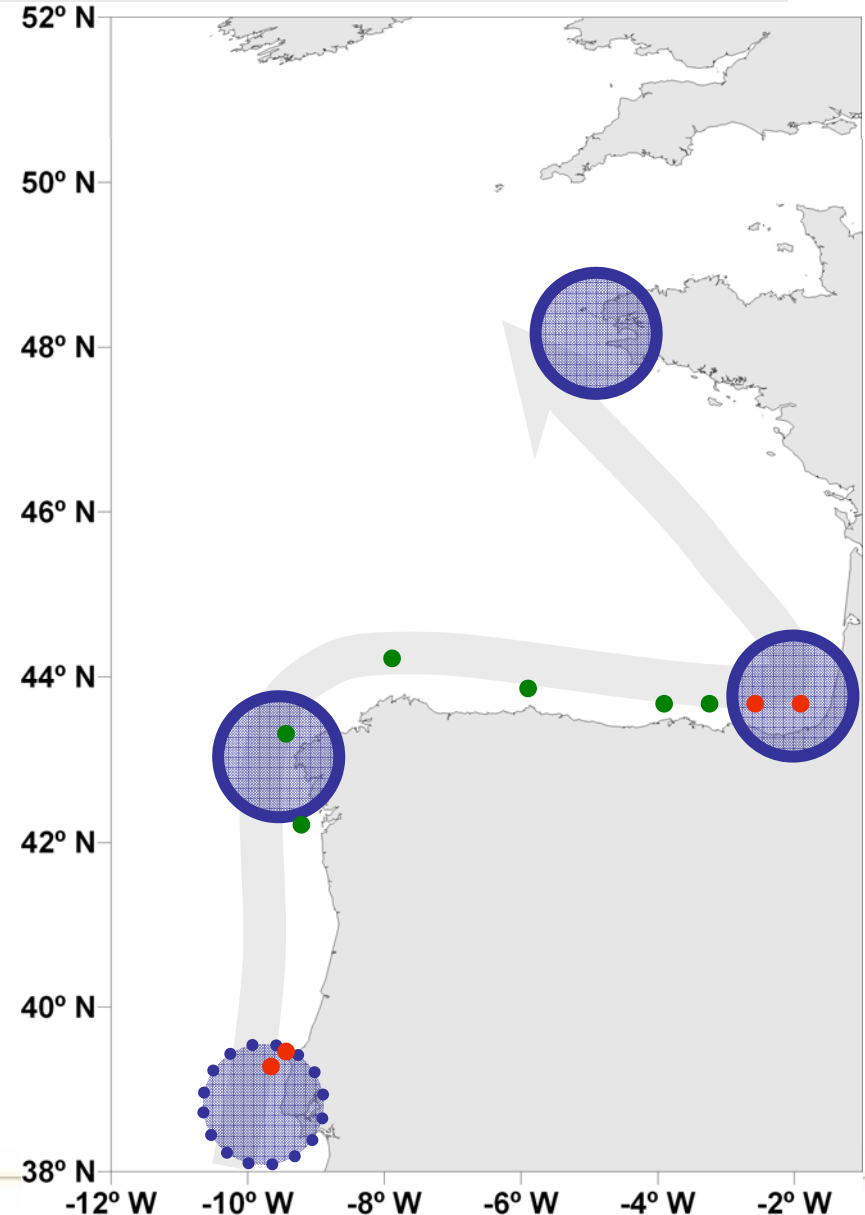
**What is the spatial variability of these processes along the IBI coast?**

**Does the IBI model reproduce them properly? At a local scale? At a regional scale?**

## **METHODOLOGY**

- *Wind and current point to point comparisons, analytical models of wind-current interactions*
- *Spectra and coherence spectra (or wavelets or CCA or others)*

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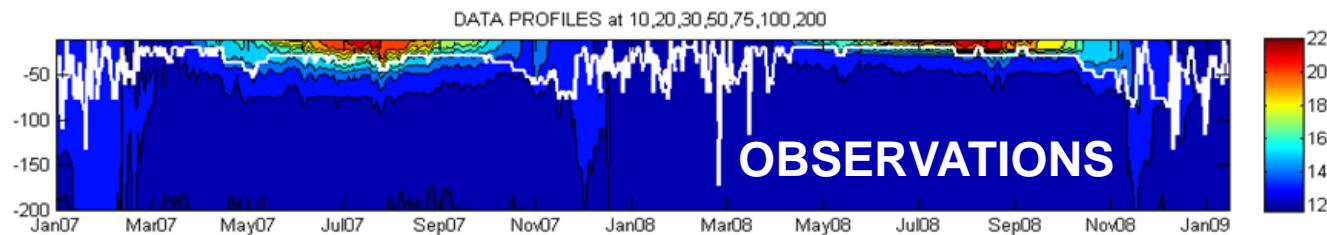
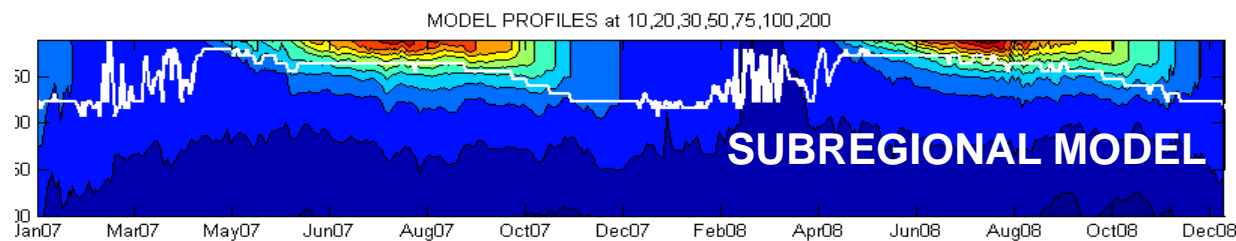




# Slope current and surface transport

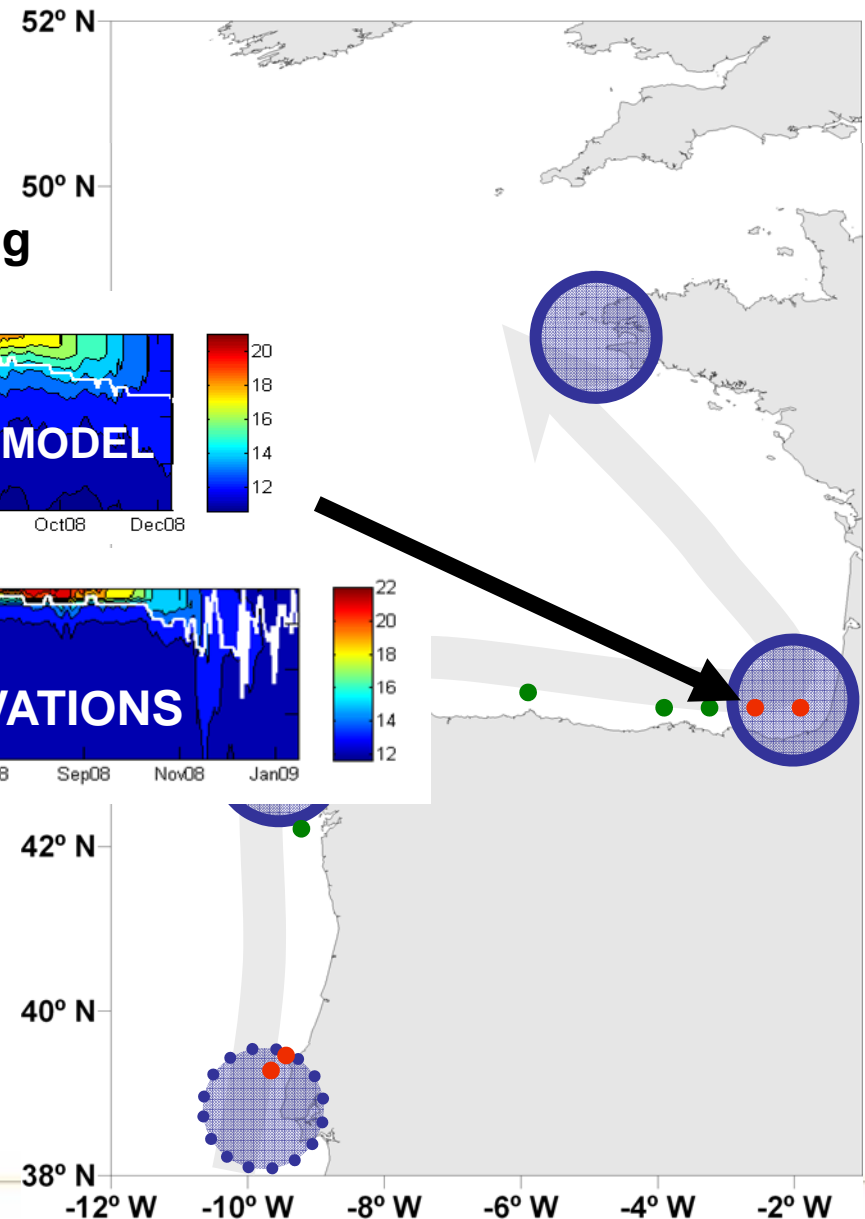
Main questions:

➤ **Stratification conditions, vertical mixing**



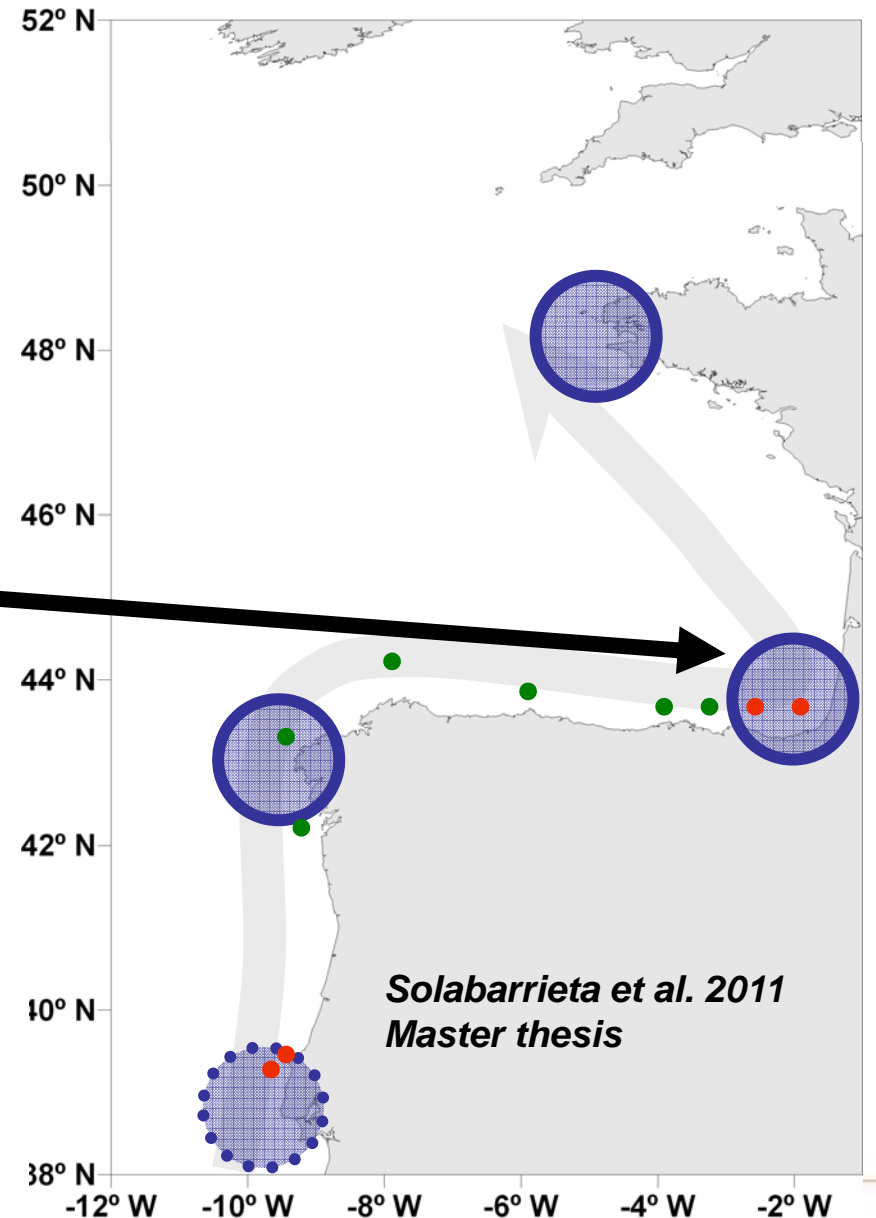
*Rubio et al. 2010*

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- Stratification conditions, vertical mixing
- **Surface signal of the slope current (time and space variability)**







- Stratification conditions, vertical mixing
- Surface signal of the slope current (time and space variability)
- **Vertical structure of the slope current**





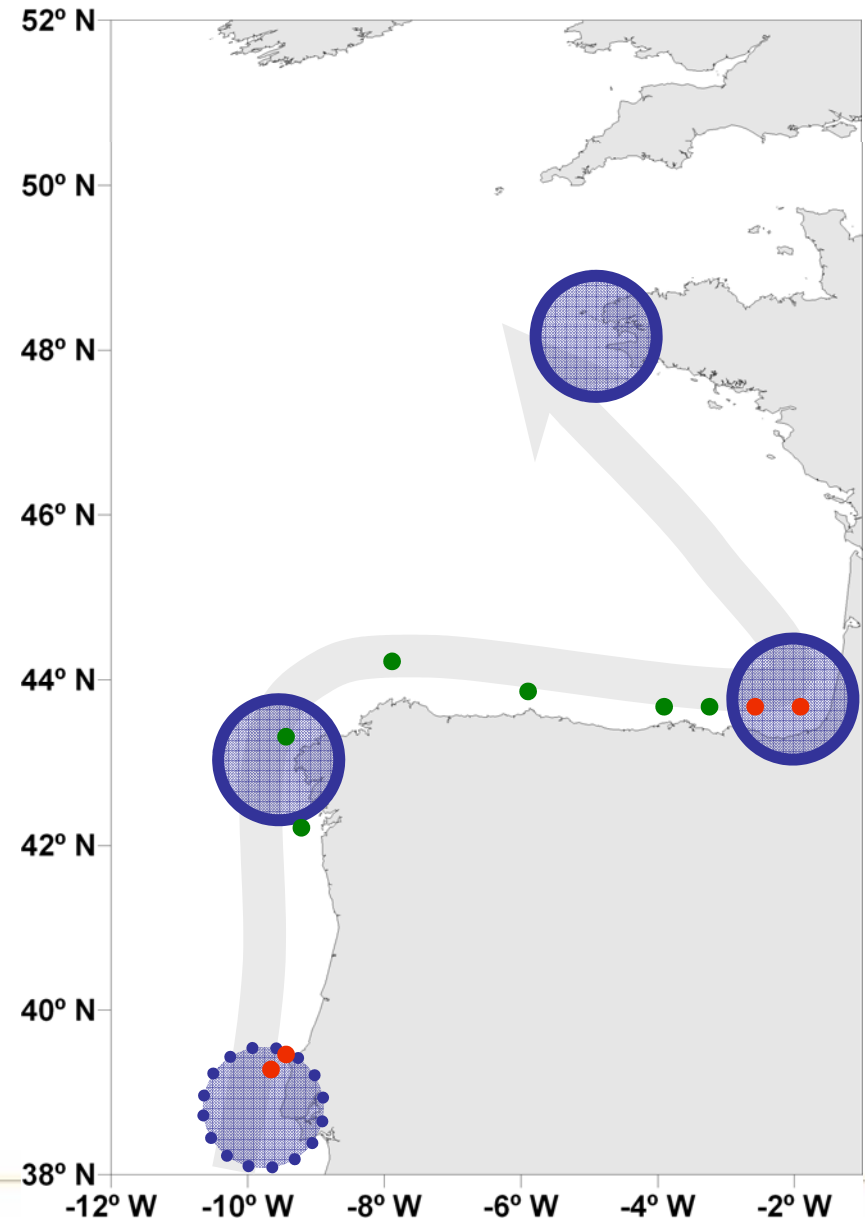
# Slope current and surface transport

Main questions:

- Stratification conditions, vertical mixing
- Surface signal of the slope current (time and space variability)
- Vertical structure of the slope current
- **What is the spatial variability of these processes along the IBI coast?**
- **Does the IBI model reproduce them properly? At a local scale? At a regional scale?**

## **METHODOLOGY**

- *Current point to point comparisons focusing at different time scales*
- *Joint analysis of in-situ + satellite information*





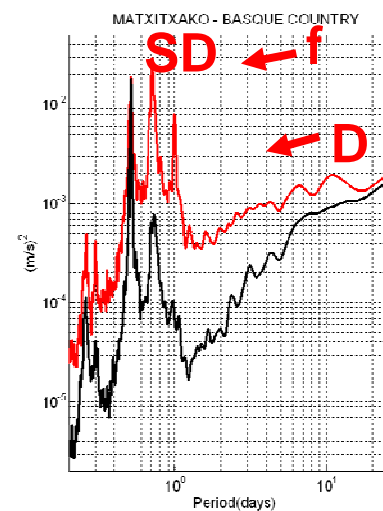
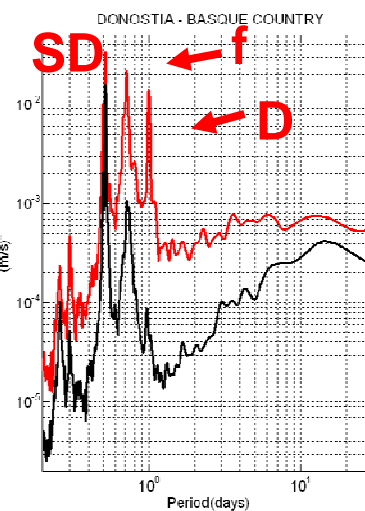
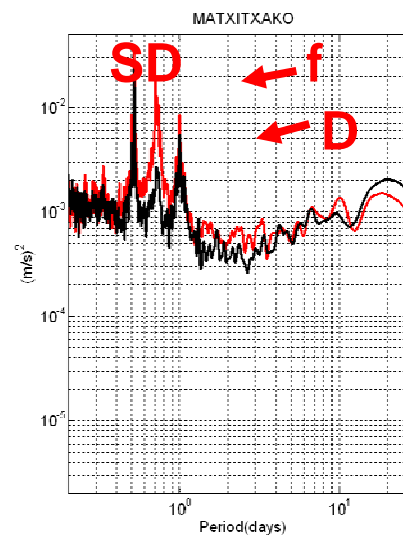
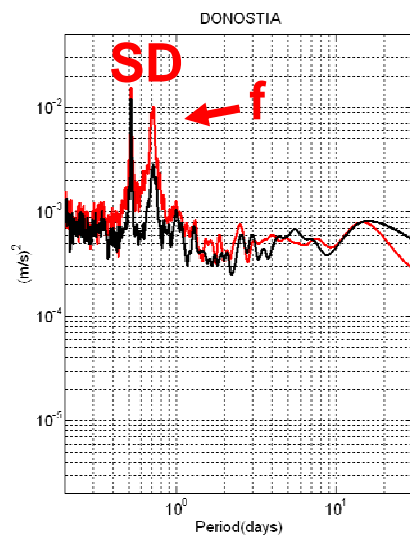
# Contribution of other processes to the surface circulation

Main questions:

➤ Tides, inertial waves

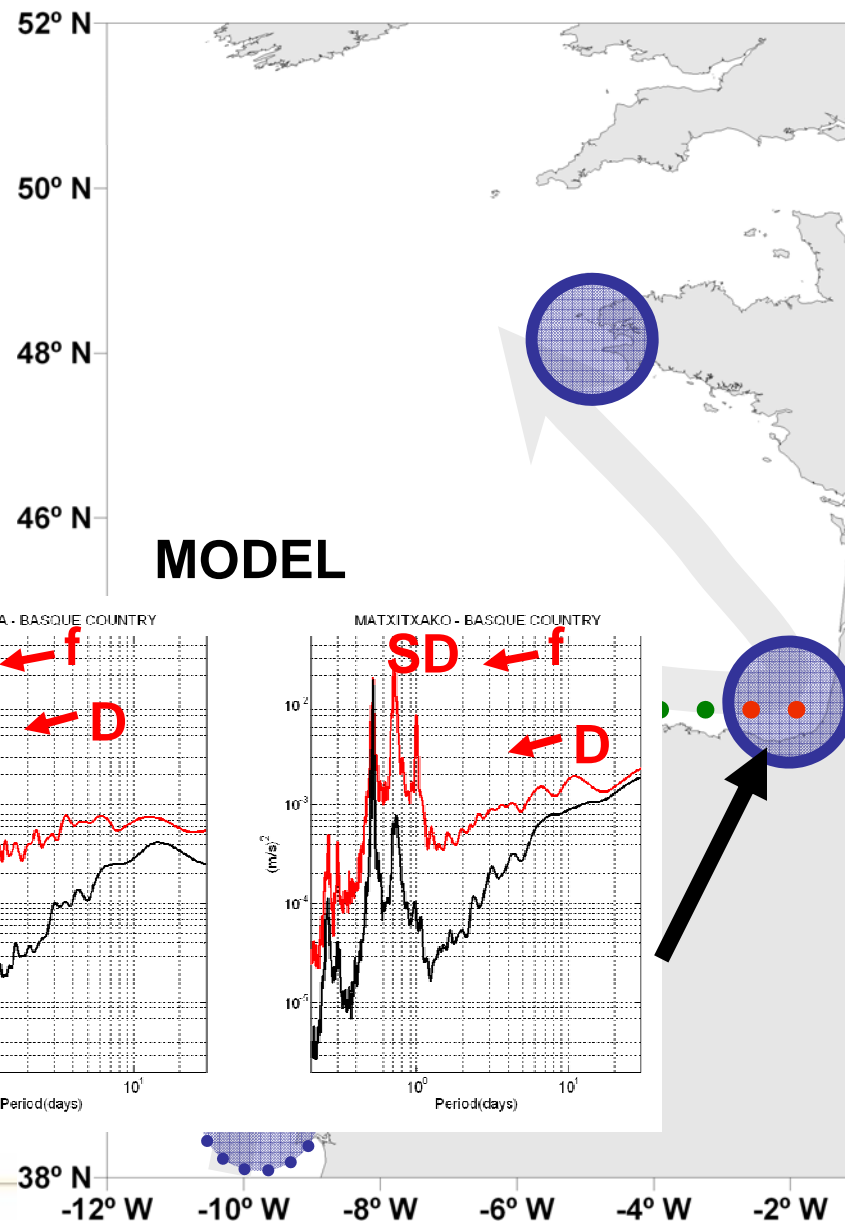
— 10-40 m  
— 100-140 m

## OBSERVATIONS



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## MODEL



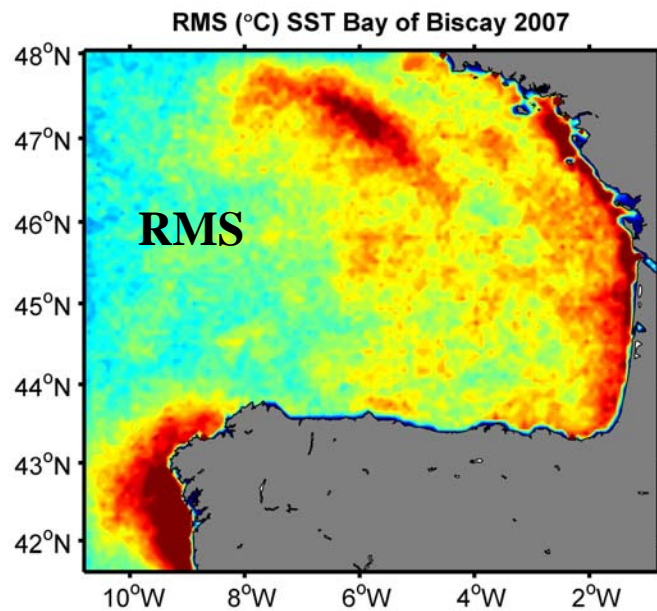




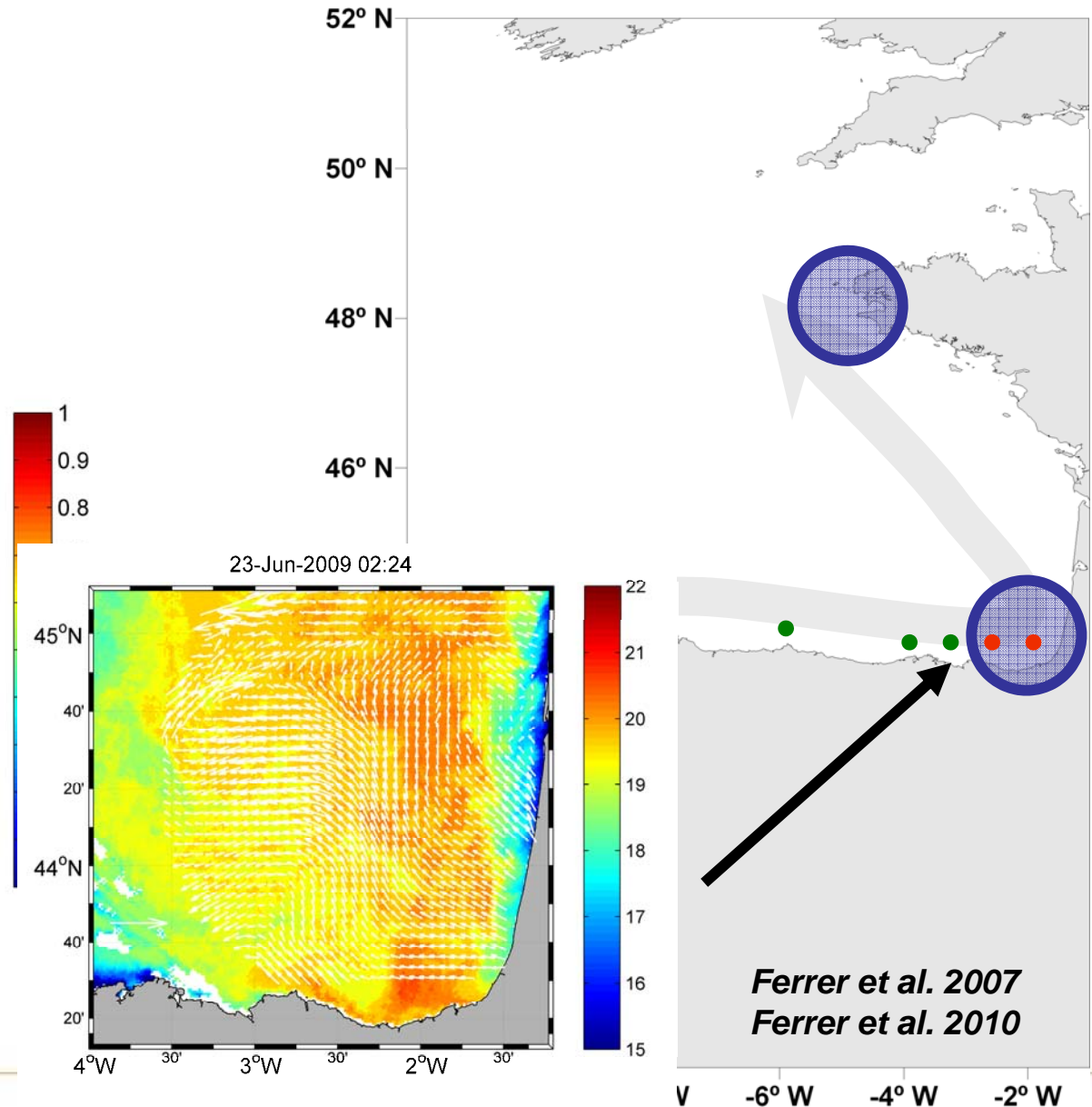
# Contribution of other processes to the surface circulation

Main questions:

- Tides, inertial waves
- Upwelling processes
- ....



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# Contribution of other processes to the surface circulation

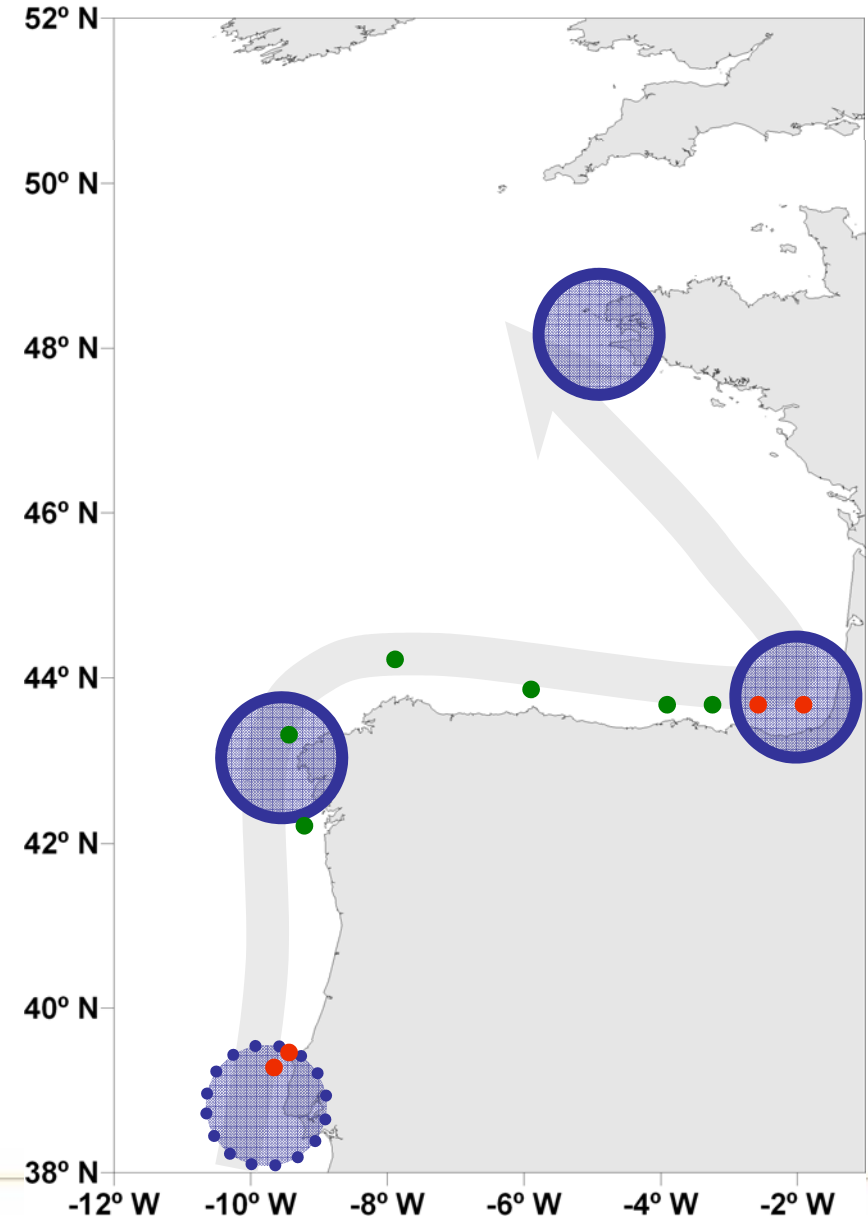
Main questions:

- Tides, inertial waves
  - Upwelling processes
  - ....
- 
- What is the spatial variability of these processes along the IBI coast?
  - Does the IBI model reproduce them properly? At a local scale? At a regional scale?

## **METHODOLOGY**

- Point to point comparisons
- focusinf at different time scales
- Joint analysis of in-situ + satellite information

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## Summary / next steps

### Main ideas

- Process oriented validation
- Focus on surface circulation
- IBI area integrated approach

### Potential benefits

- Scientific <-> Operational
- Feedback for observing systems developments

### Next steps

- Define key actors / systems
- Framework for progress

