

A comparison between modelled ocean surface currents and HF radars measurements

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Framework

Real time modeling of the bay of Biscay

Purpose

**to have an operational system that provides data
for both civil and military uses**

Outline

1- System description

2- Current comparison

1- System description

Bay of Biscay HYCOM model

Area : 15°W to 3°E, 43°N to 51°N

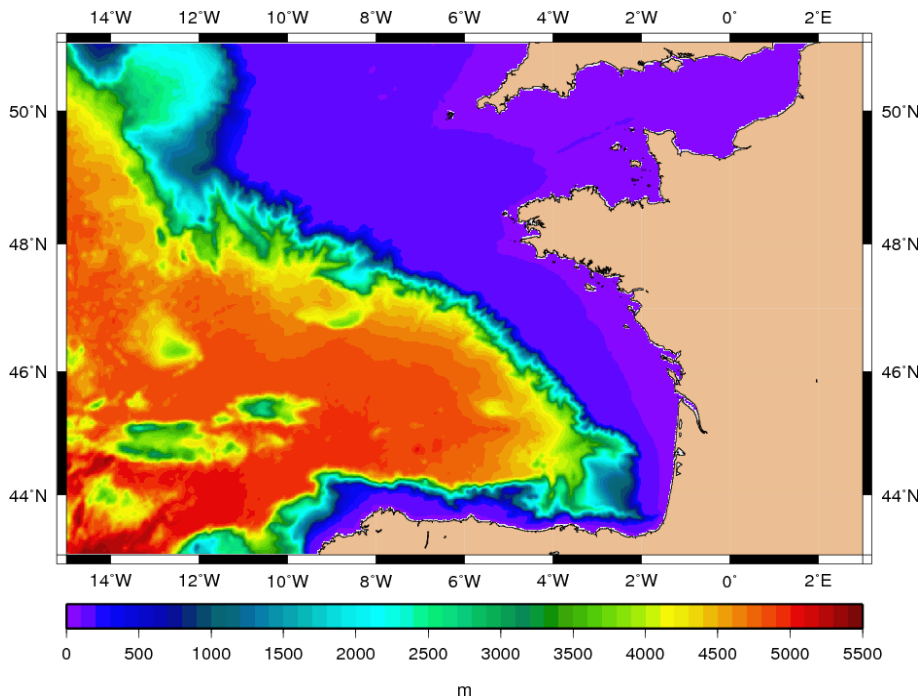
Resolution : 1' (720x471), 32 layers

Configuration :

- ✓ no assimilation
- ✓ meteorological forcing : Météo-France (0.5°)
- ✓ tide : MOG2D (Legos lab)
- ✓ boundary conditions : Mercator outputs
- ✓ rivers outflows

A few characteristics

- ✓ KPP mixing
- ✓ non-linear barotropic equations
- ✓ monthly target densities



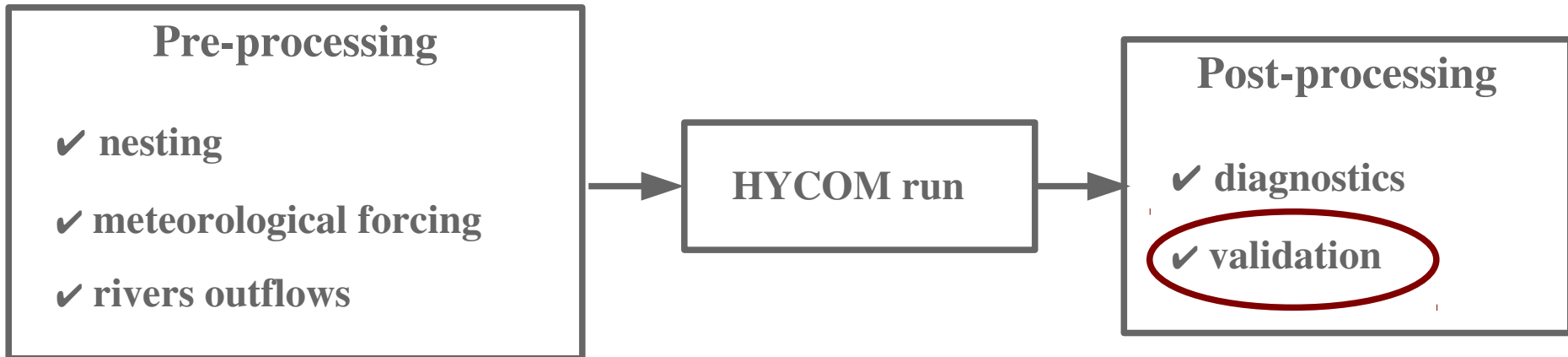
Bathymetry

1- System description

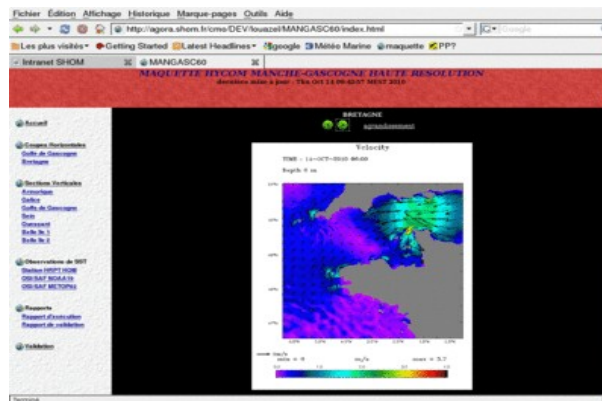
Scenario

✓ the system is run daily from D-2 to D+5,

✓ 3 steps



✓ intranet website daily updated



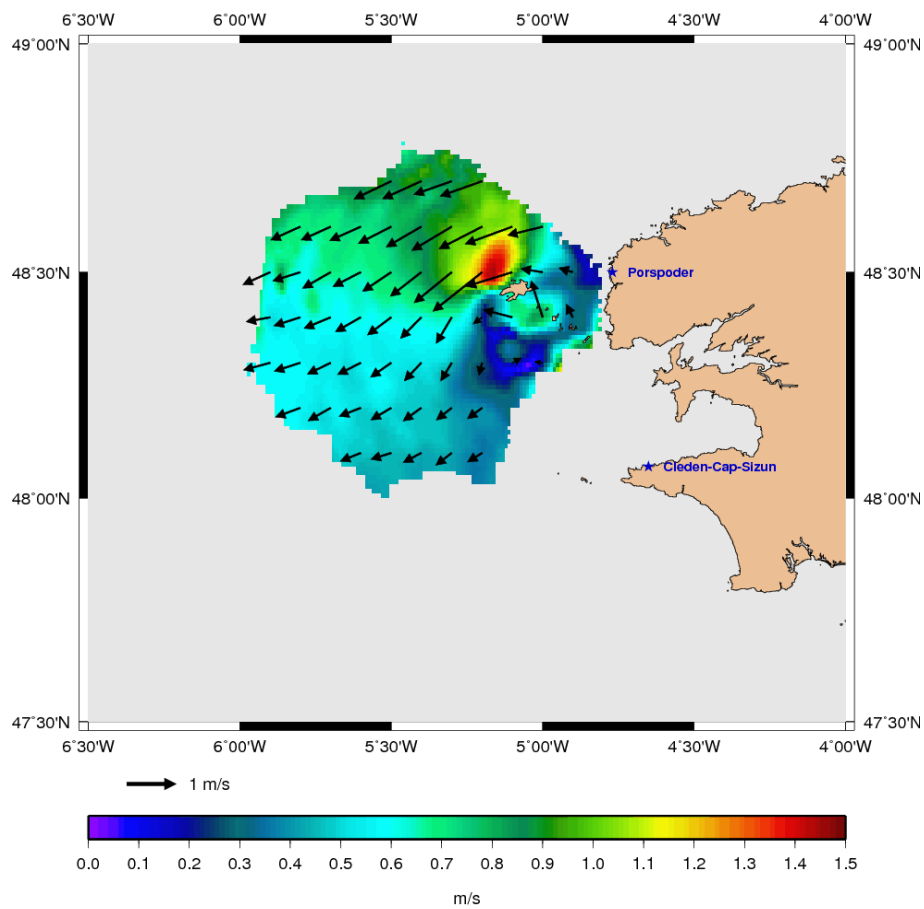
Validation

- ✓ **SSH: comparison with tidal gauges**
- ✓ **Temperature and salinity: comparison with in situ profiles**
- ✓ **SST: comparison with permanent mooring data**
- ✓ **SST: comparison with satellite data**
- ✓ **Surface currents: comparison with HF radars data**

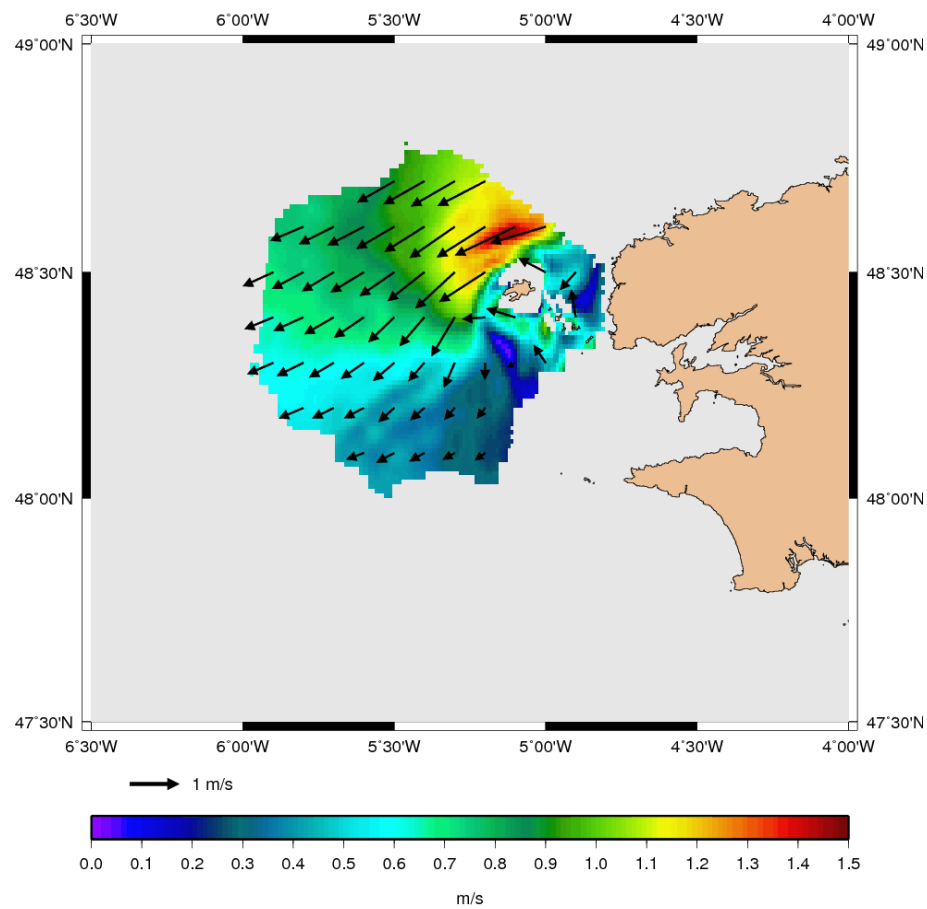
2- Current comparison

Total current 12/25/2010 01.00 PM

HF radars



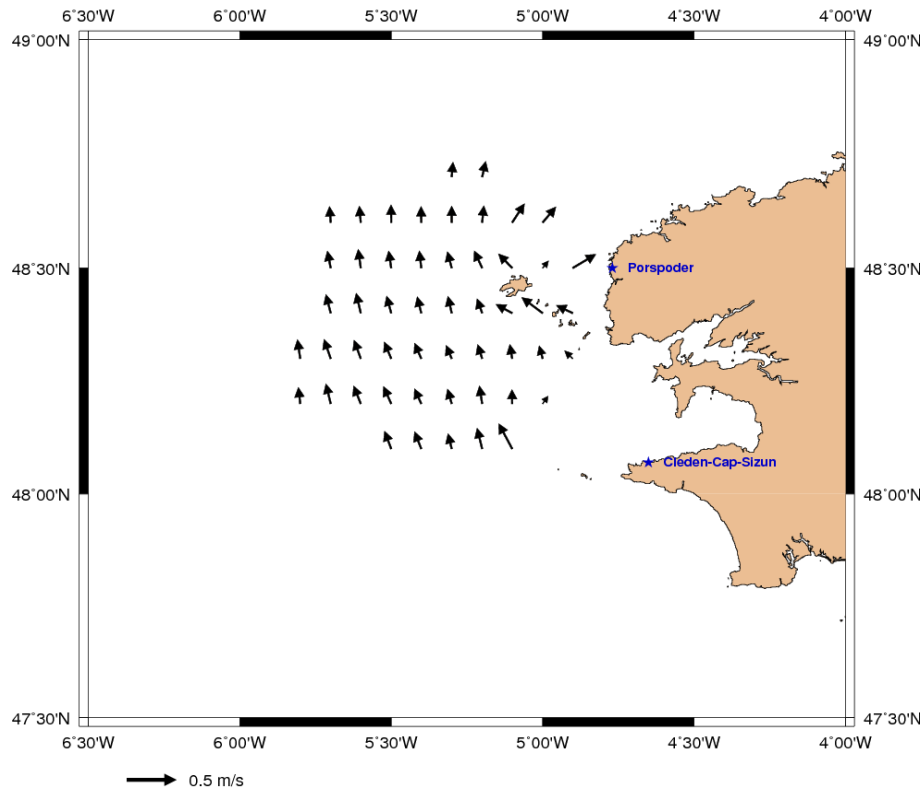
Model



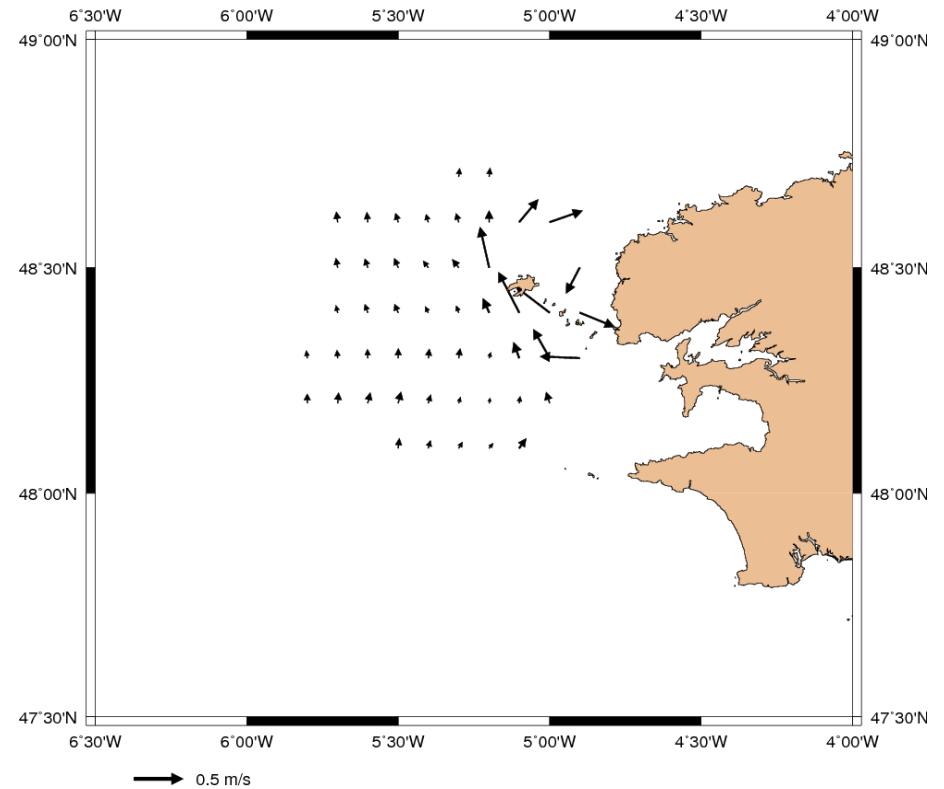
2- Current comparison

Residual current 12/26/2010 12.00

HF radars



Model



What can explain these differences ?

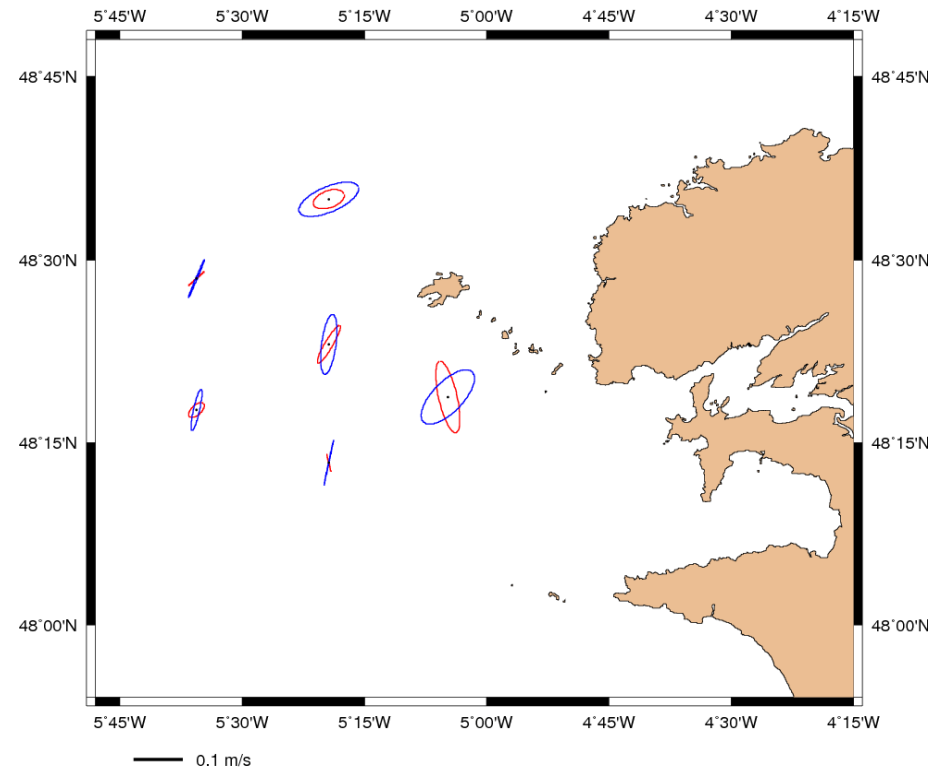
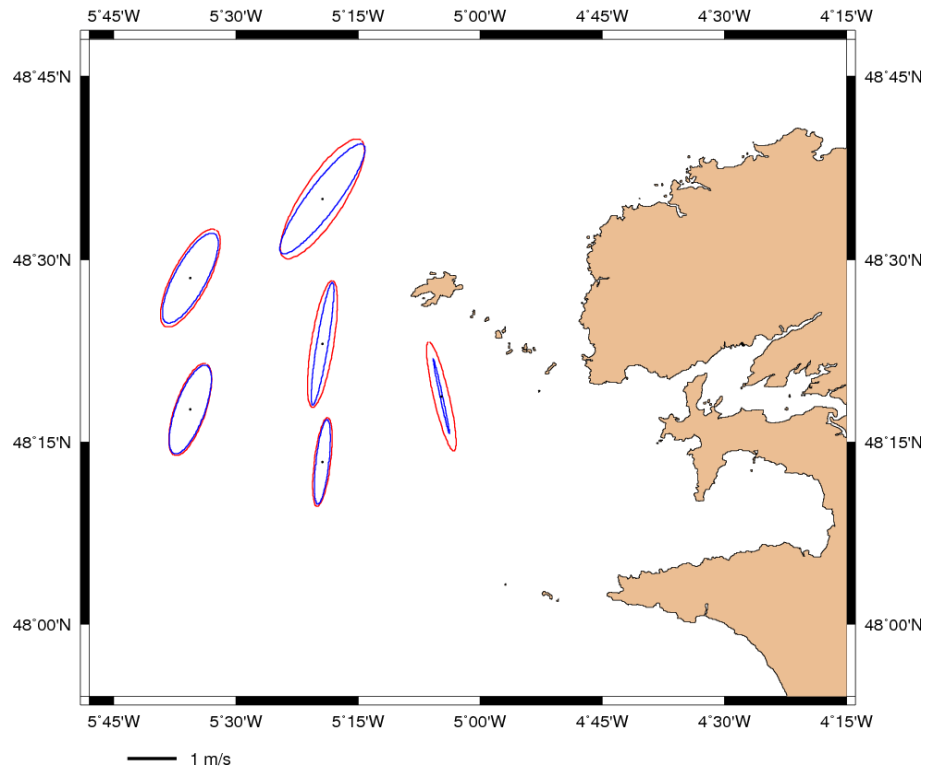
- small signal compared to the total current
- Stokes drift absent in the model
- smoothed HF radars data
- signal very sensitive to the rough bathymetry

2- Current comparison

Tidal current ellipses

M2 constituent

M4 constituent



Model



HF radars

Problems : bottom friction, bathymetry ?

Conclusion

How to improve the comparison ?

—————▶ **Framework**

✓ **to work in a research framework rather than in a pre-operational framework**

—————▶ **Model**

✓ **higher resolution to better describe the bathymetry**
✓ **to improve the bottom friction**

—————▶ **Data**

✓ **to test other data treatment in order to have more realistic currents (less smoothed data)**