Validation de la maquette HYCOM Manche-Gascogne a partir des observations

Rui Duarte, Stéphanie Louazel et Flavien Gouillon

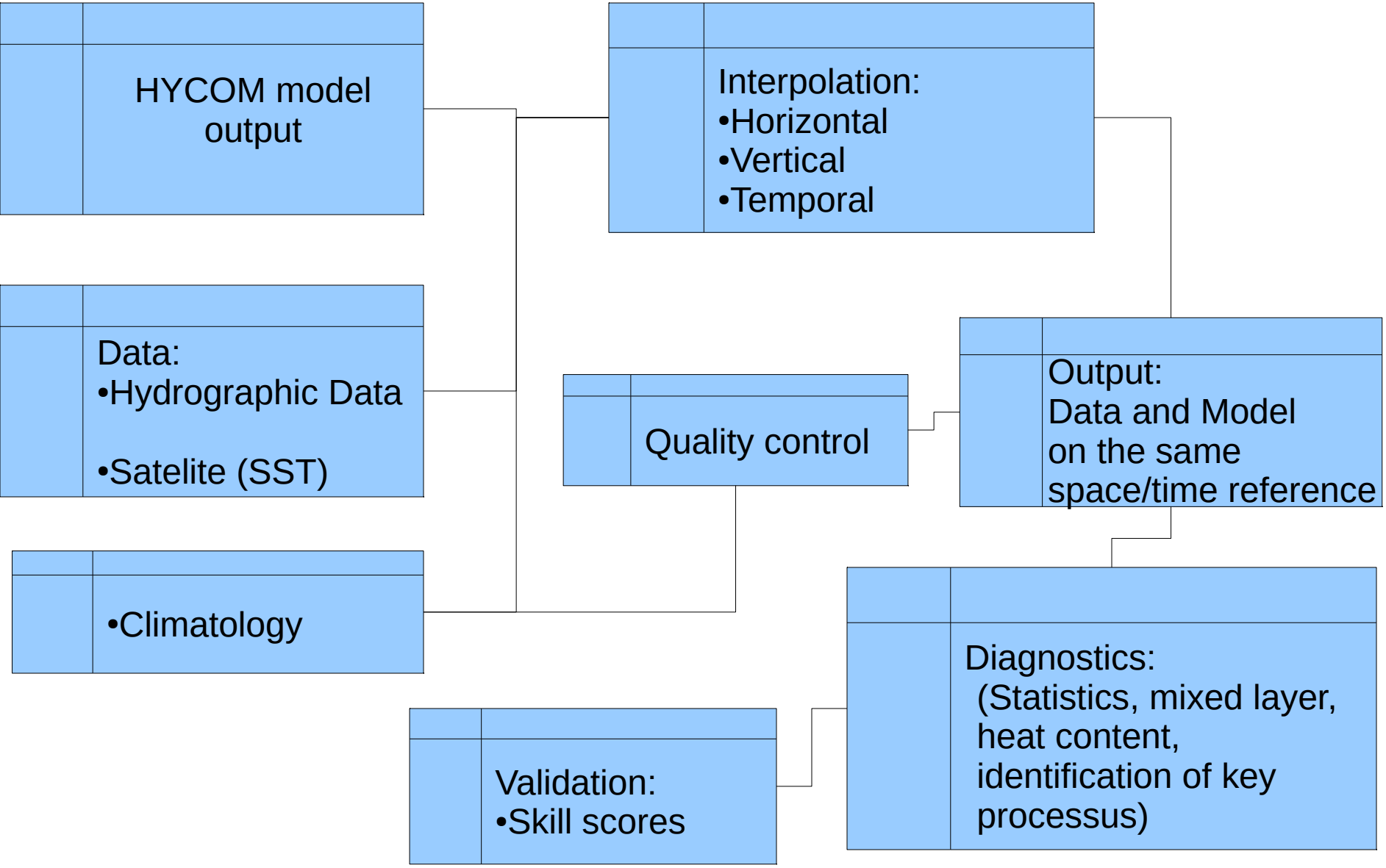
Motivation

- Rapid validation of a HYCOM model configuration from available data.
- The process should be transparent to the user without the need to know or change the code.
- Managed by a config.ini file with paths to the model output and observational data, time period (tmin, tmax) and area (longitude, latitude) interval.

Method

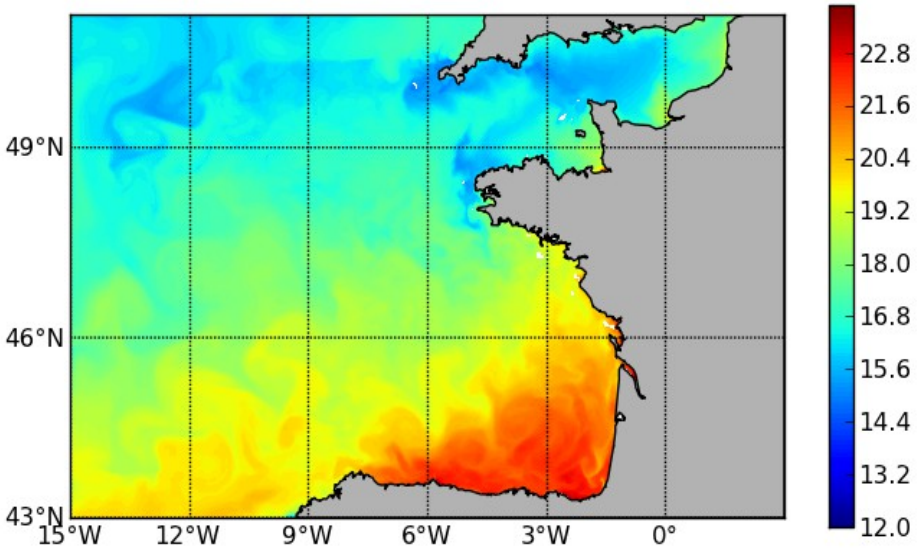
- Validation modules written in the Python language.
- Usage of generic visualization and computational libraries (matplotlib, numpy, vacumm)
- possibility of interface with existing Fortran libraries

Validation Strategy



Study region

Maquette HYCOM
Manche-Gascogne



Currently we have the possibility to compare the model with:

-Hydrografic data (Pyvalid -campagnes)

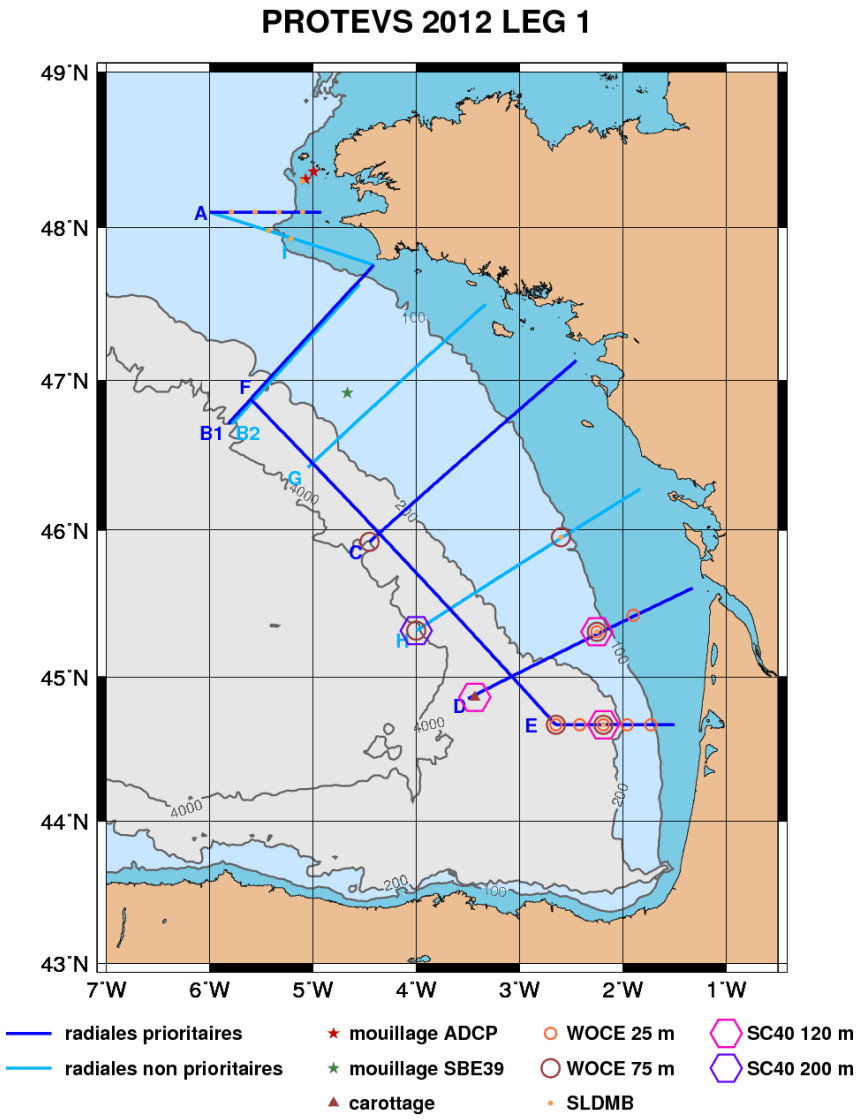
-Satelite SST (Pyvalid - SST)

Campagne PROTEVS 2012

Campagne realisé a bord du BHO Beautemps-Beaupré

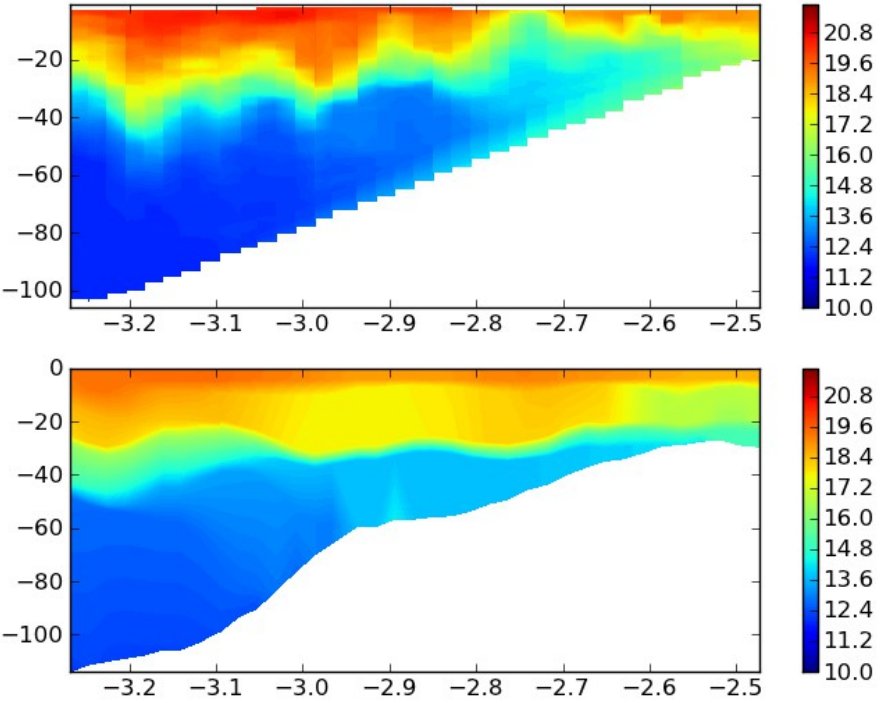
en Août – Septembre 2012

- SeaSoar
- Bathysonde CTD – LADCP – capteurs biochimiques
- VM-ADCP
- Prélèvements d'eau de mer
- Mouillages et flotteurs

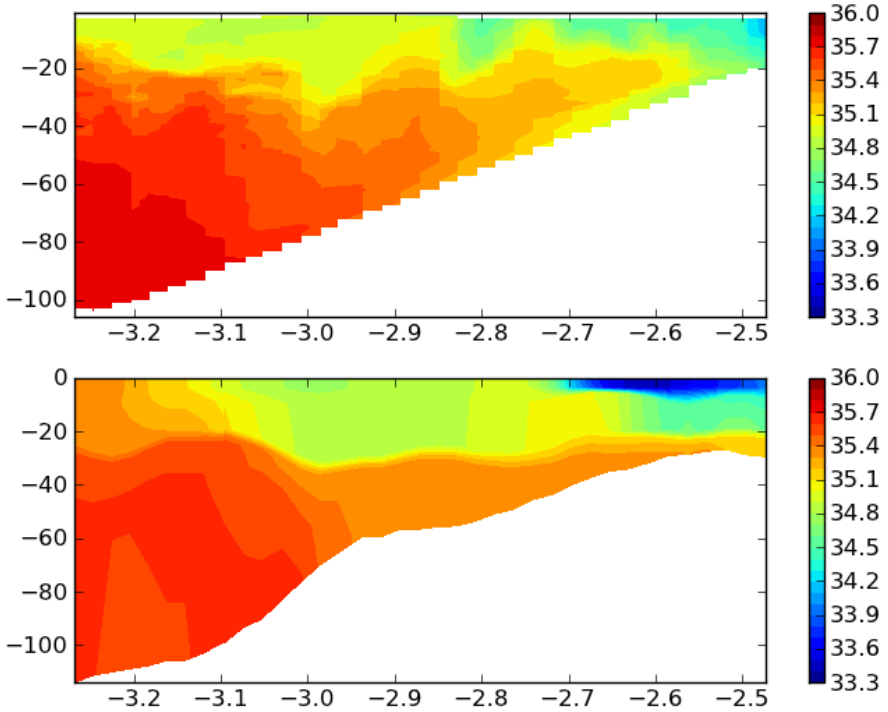


Comparaison modèle – Radiale C

Temperature

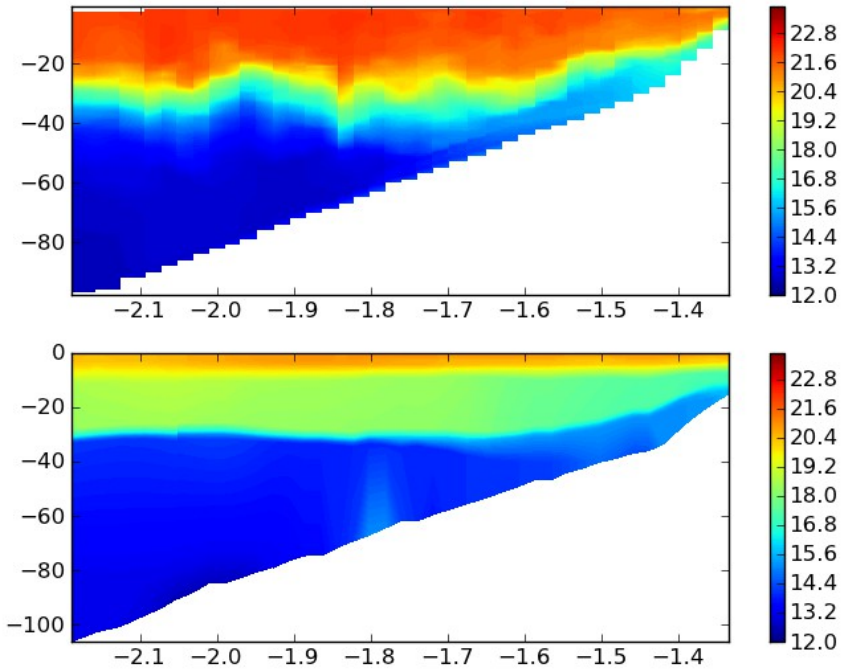


Salinite

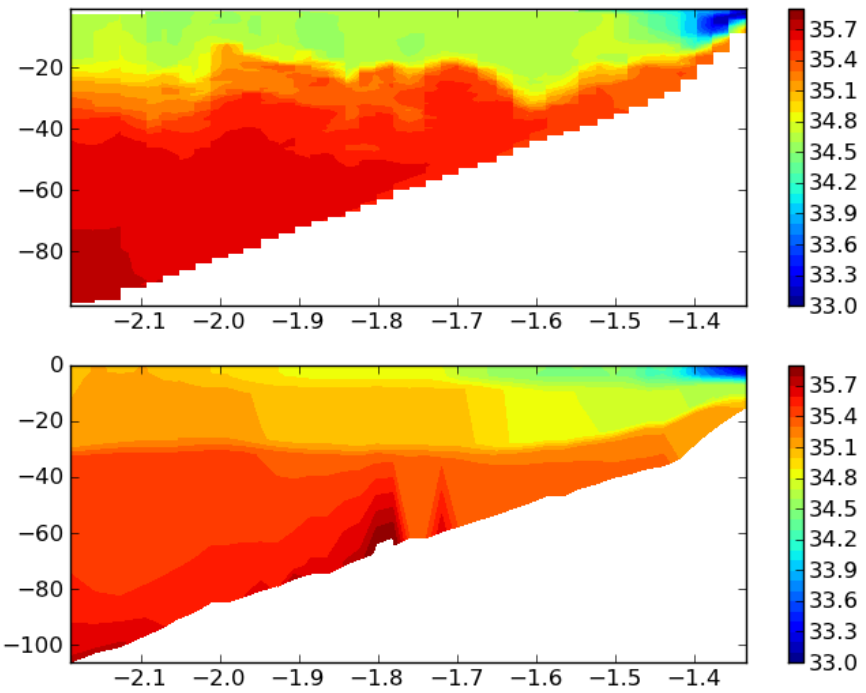


Comparaison modèle – Radiale D

Temperature

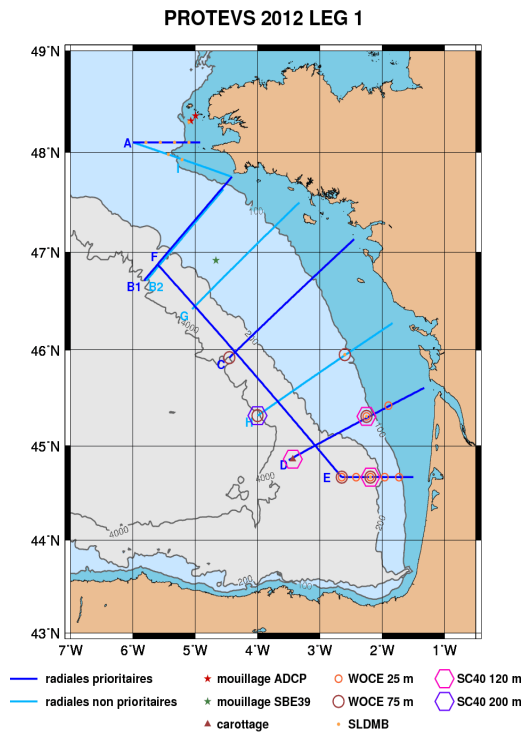


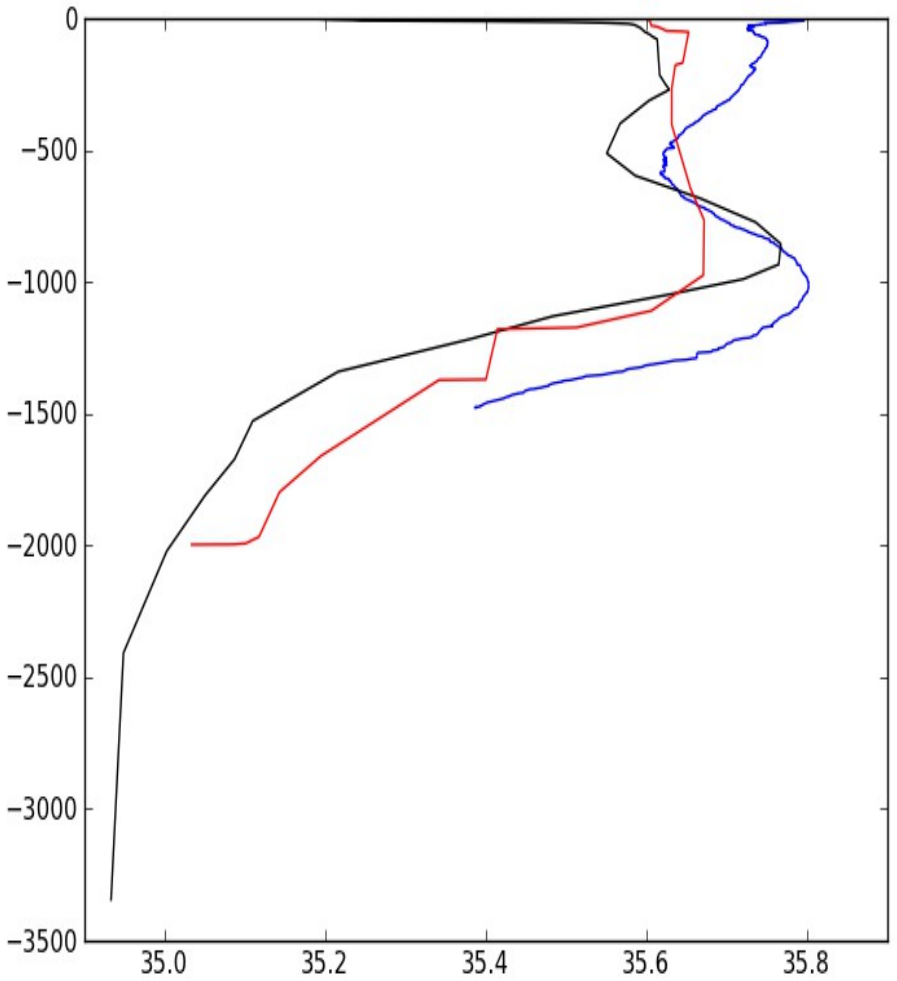
Salinite



Deep CTD survey

Detection of the Mediterrean water in the Salinity field

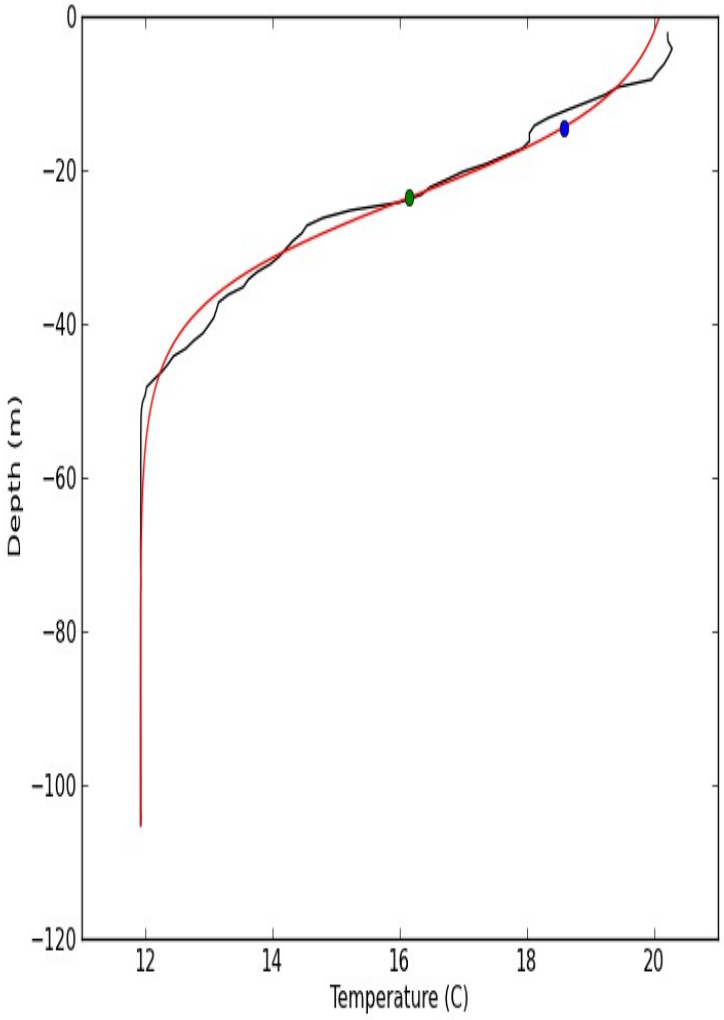




Mixed layer

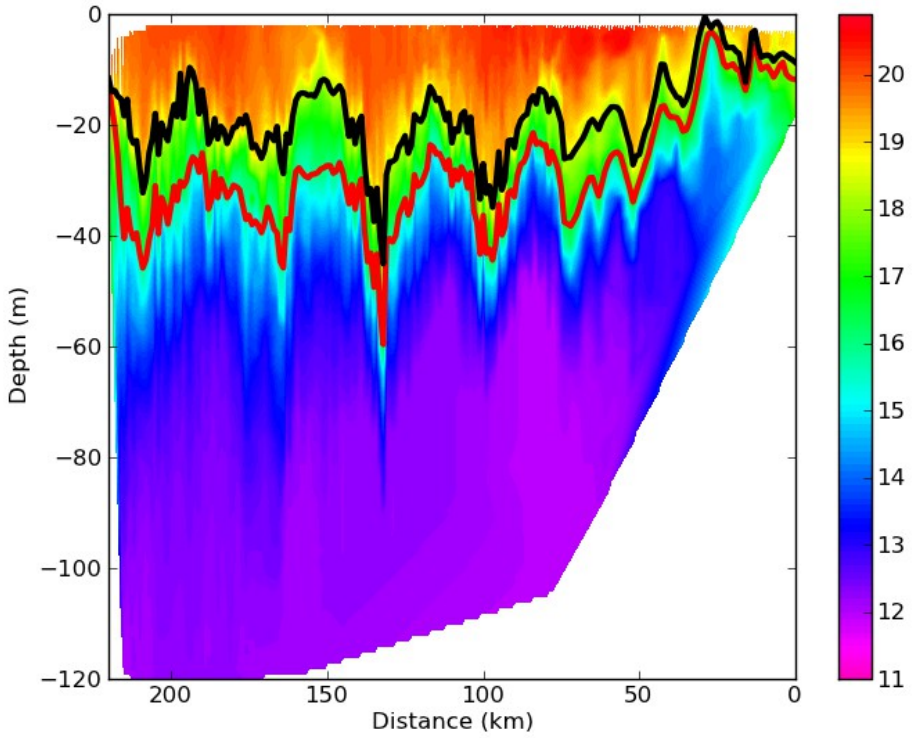
The thermocline and mixed layer depth is computed by fitting a sigmoid curve to the vertical temperature profile using the method described in Alvera-Azcárte et al (2011)

$$S(z) = T_u + \frac{T_b - T_u}{1 + e^{((z-D)/2W)}}$$

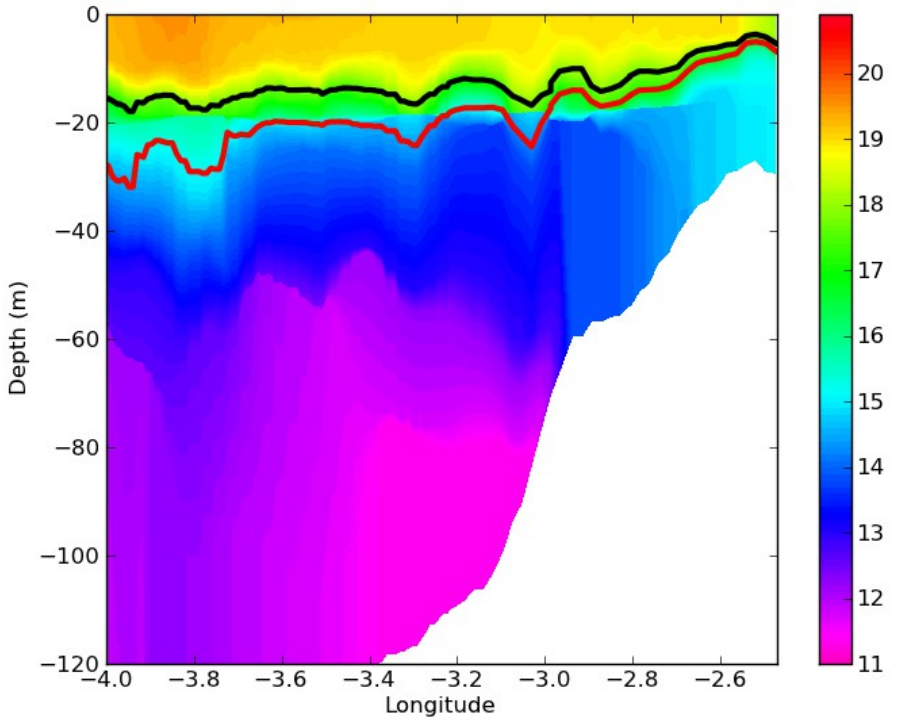


Mixed layer – Radiale C

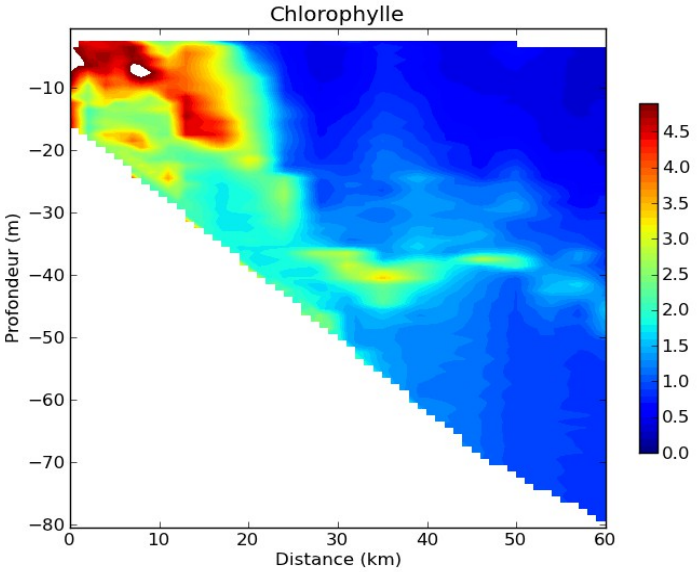
CTD + Seasoar

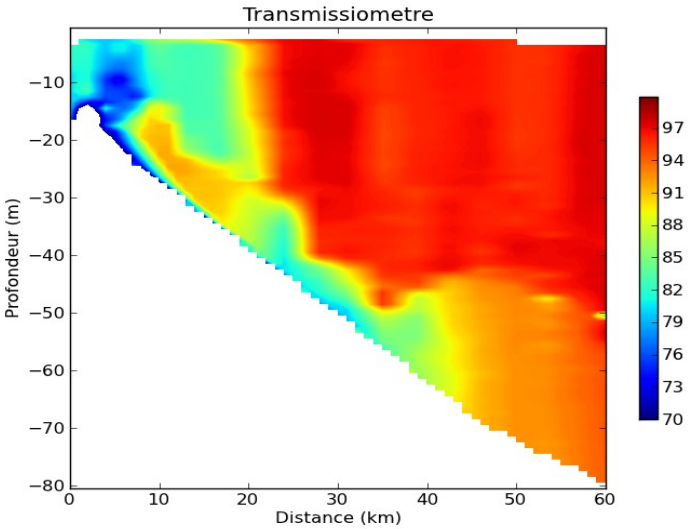


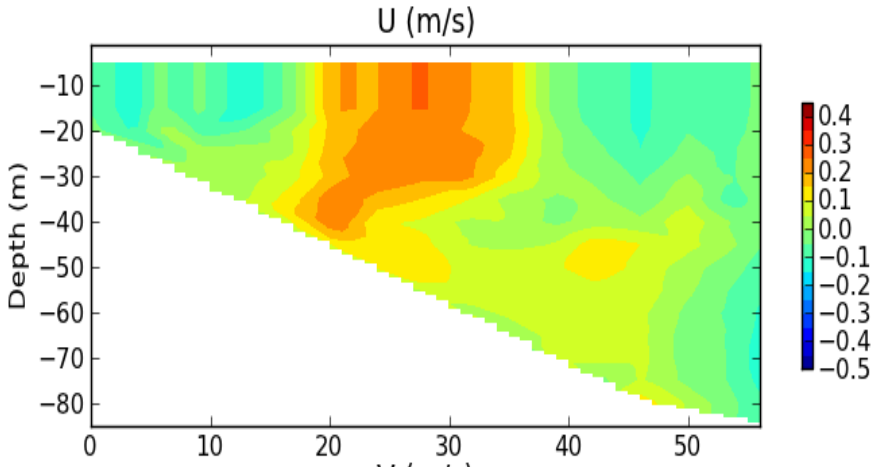
Model

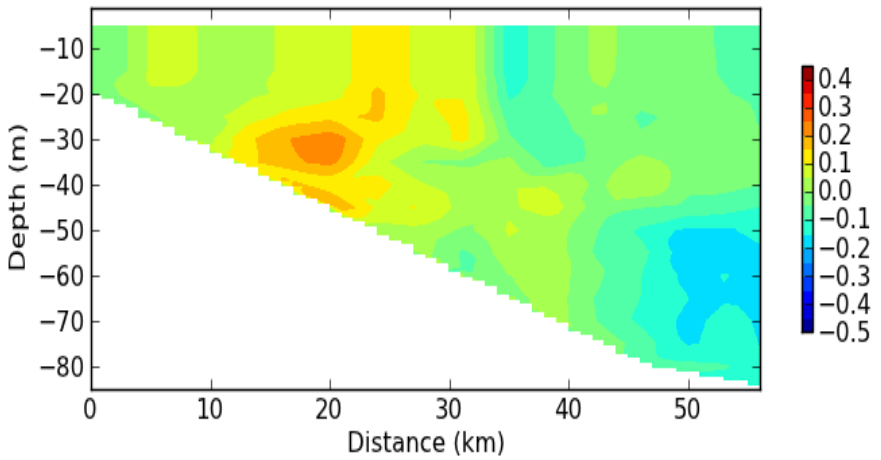


Other outputs





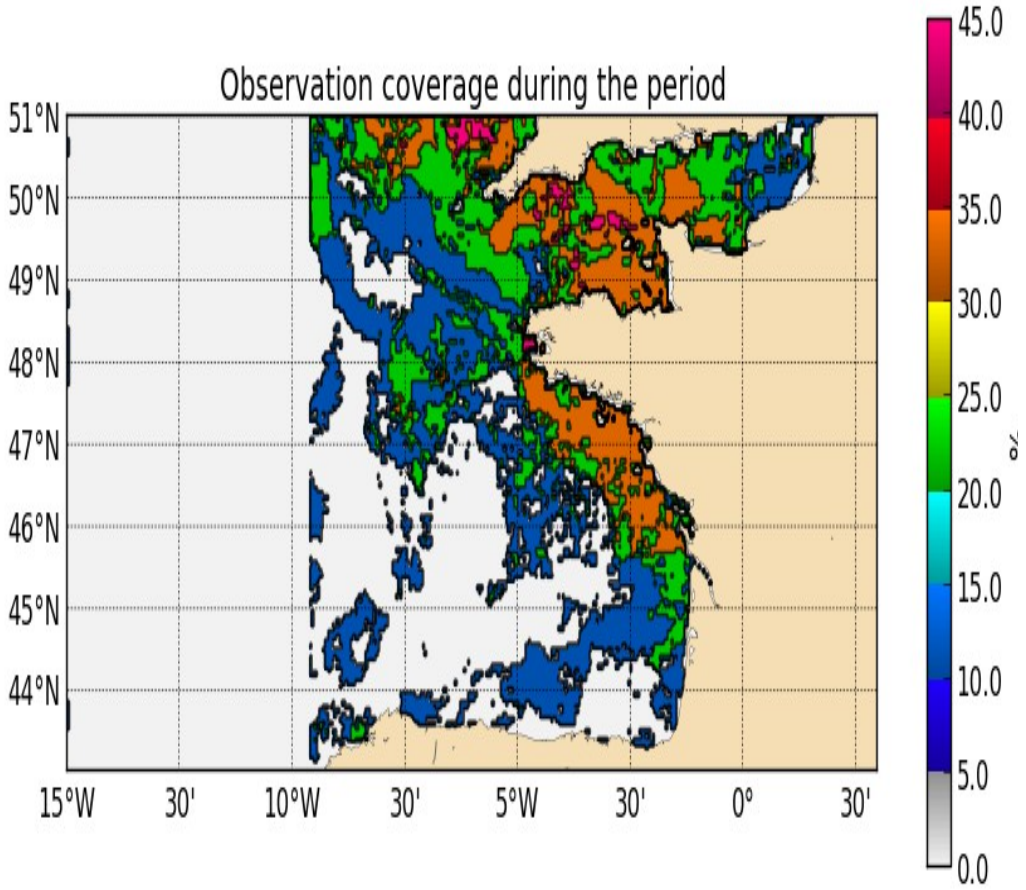


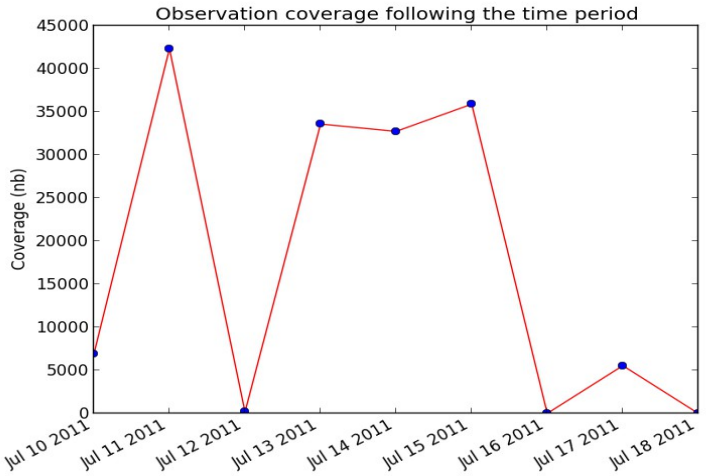


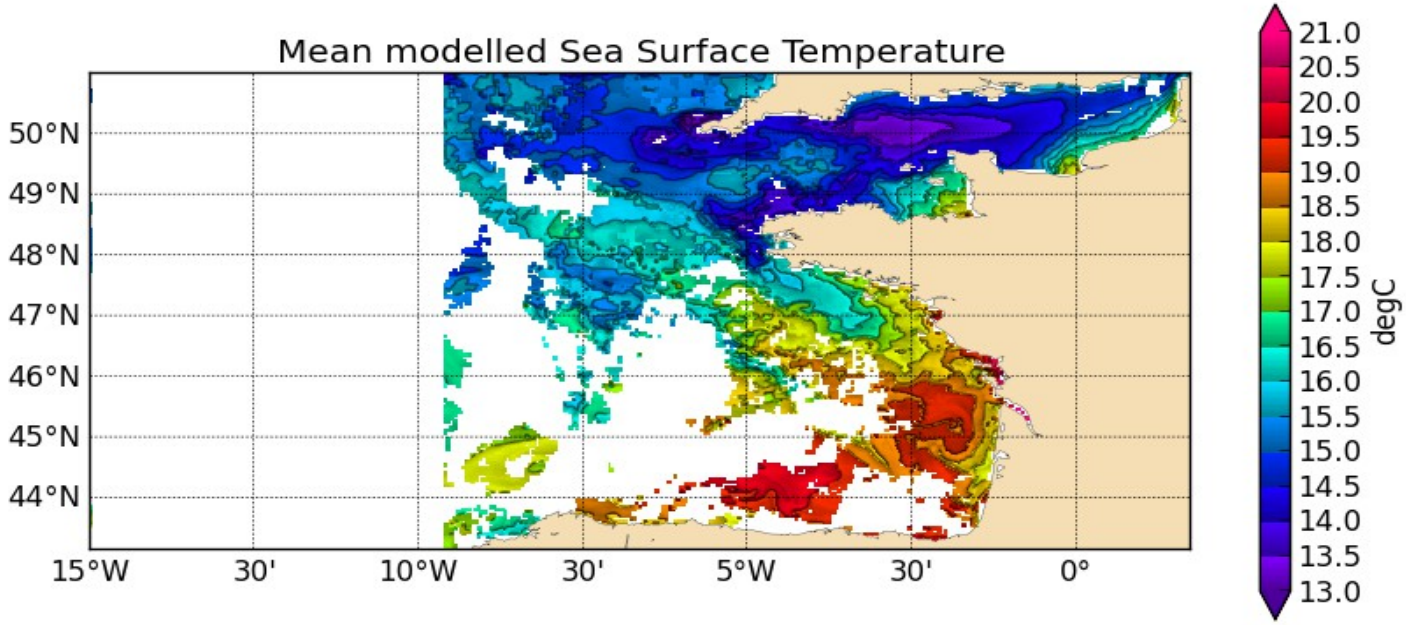
Pyvalid - sst

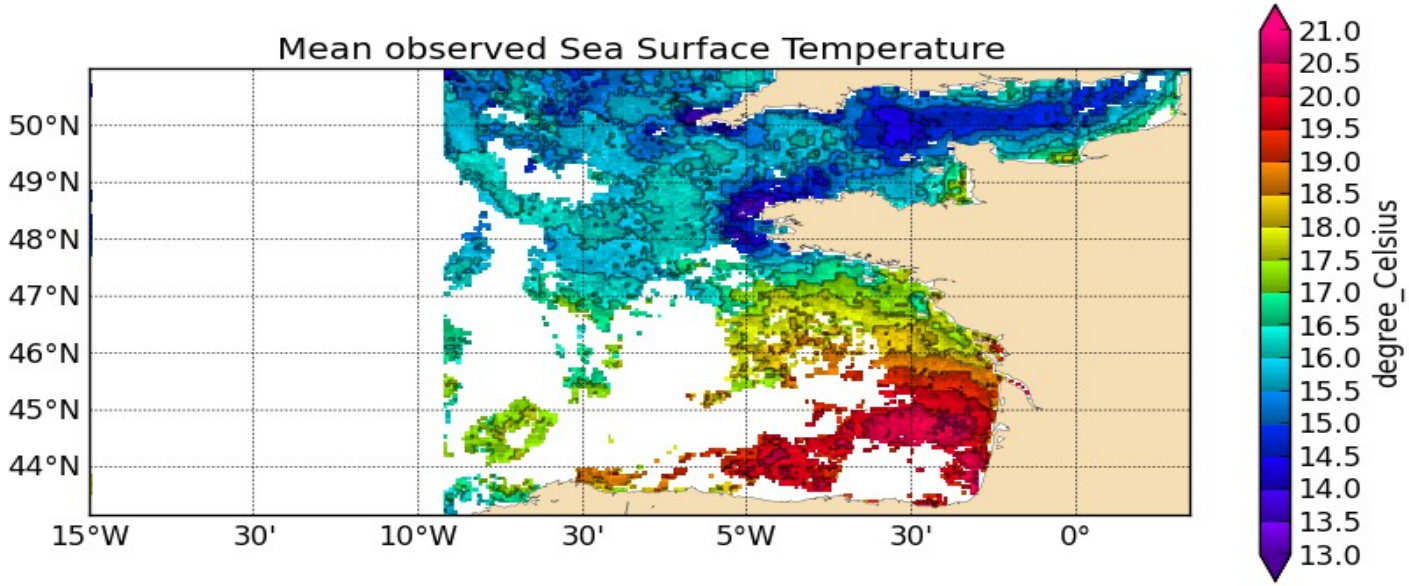
- Based on the Pyvalid program and VACUMM library developed at DYNECO – Ifremer
- Comparison with SEVERI satelite SST data available for the required period

Example during the Summer period

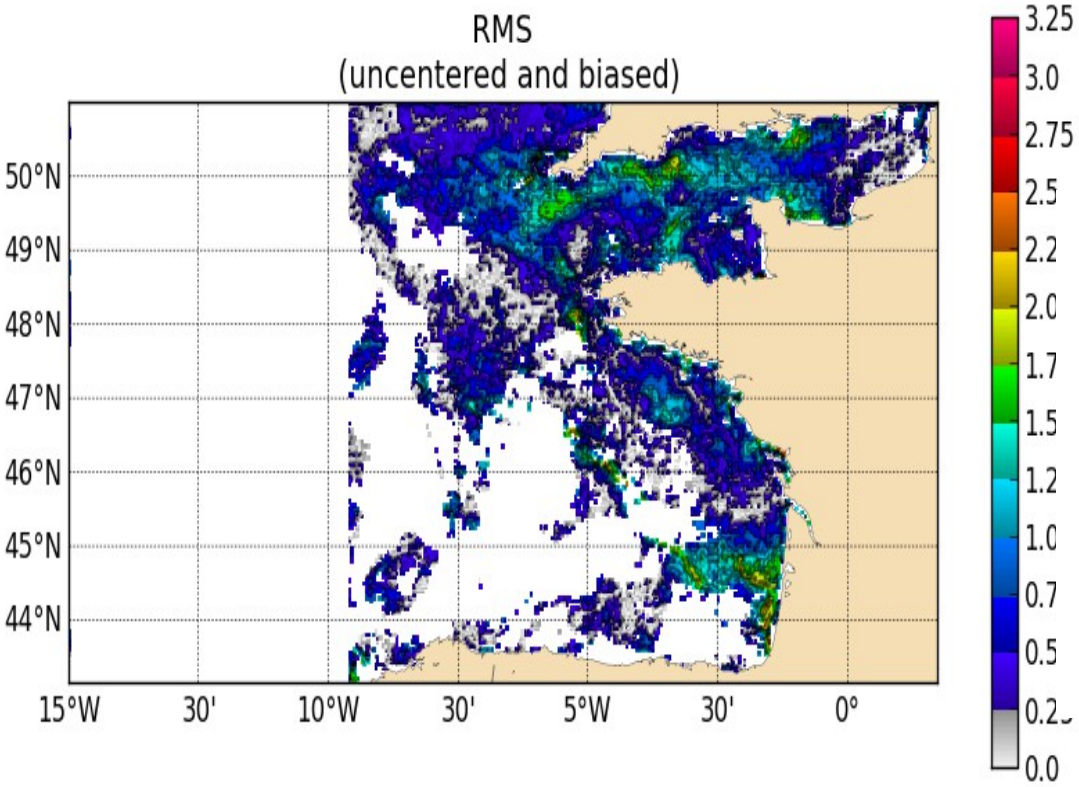


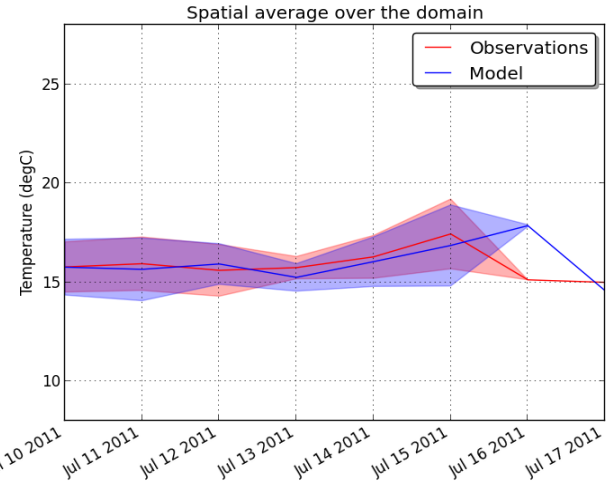



Mean modelled Sea Surface Temperature
50°N
49°N
48°N
47°N
46°N
45°N
44°N
15°W
30'
10°W
30'
5°W
30'
0°
21.0
20.5
20.0
19.5
19.0
18.5
18.0
17.5
17.0
16.5
16.0
15.5
15.0
14.5
14.0
13.5
13.0
degC


Mean observed Sea Surface Temperature
50°N
49°N
48°N
47°N
46°N
45°N
44°N
15°W
30'
10°W
30'
5°W
30'
0°
21.0
20.5
20.0
19.5
19.0
18.5
18.0
17.5
17.0
16.5
16.0
15.5
15.0
14.5
14.0
13.5
13.0
degree_Celsius

Model – Obs differences





Perspectives

- Some code cleanup and better integration of the different modules
- The user should only be required to edit the config.ini file and choose which diagnostics are performed
- Users guide
- For easier navigation, the results will be presented in a simple html page with clickable links.

Merci!