Operational Modelling and Forecasting of the Iberian Shelves Ecosystem

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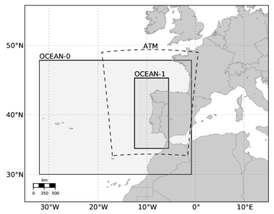
- → **BGC forecast system for the Portuguese and Galician regions**
- → **Nutrients-Phytoplankton-Zooplankton-Detritus**
- → **Results compared with radar currents and satellite SST and chlorophyll**
- → **Skill assessment during a summer upwelling period.**
- → **Free online OPenDAP distribution of model input and output**
- → **Online comparisons of model results with satellite imagery**

Modelling setup

Ocean model

- ROMS
- Two domains
- 1/10º and 3 km horizontal resolution
- 30 and 60 vertical s-levels
- Surface fluxes
- Climatological boundaries and rivers
- Gibraltar inflow/outflow parametrisation

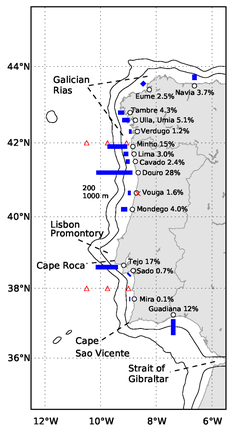


Atmospheric model

- WRF
- 25 km horizontal resolution

BGC model

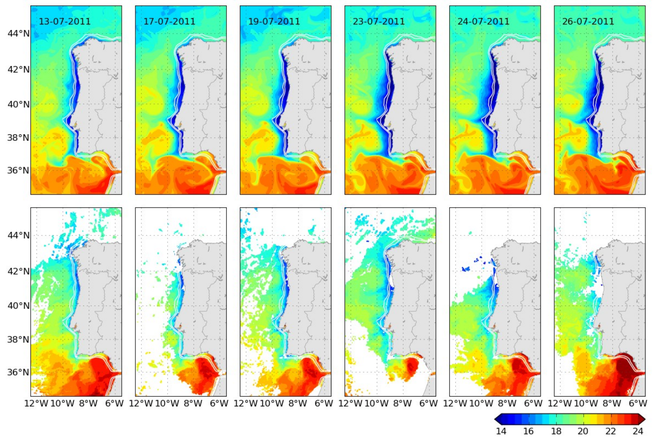
- 4-component nitrogen based ecosystem NPZD model
- Nitrate and chlorophyll for the initial and seasonal boundary conditions from WOA-05 and SeaWiFS
- Riverine inputs of nitrate and chlorophyll constant along the year



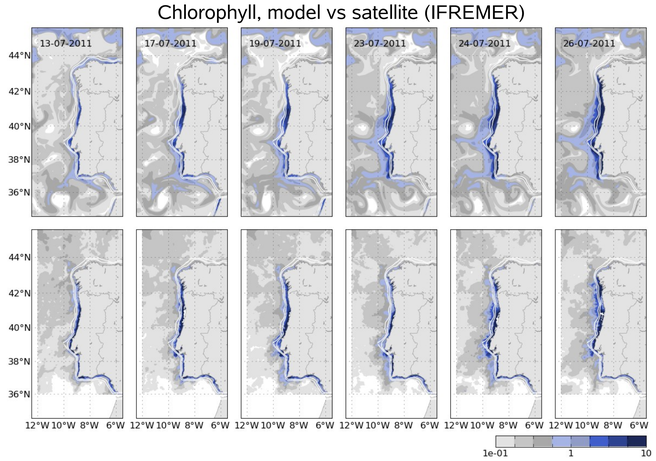
Operational system

- OOFε - Operational Ocean Forecast Python Engine
- Creates and operates the model input/output
- Executes daily analysis and 3-7 days forecast
- robust and fully automatic
- Visualisation module
- Comparison with observational data sets
- http://neptuno.fis.ua.pt/oof

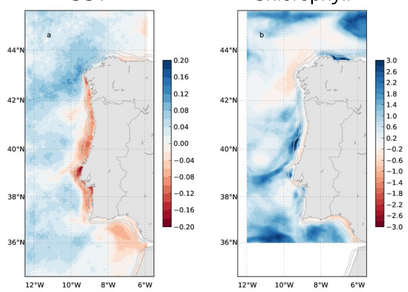
SST, model vs satellite (OSISAF)

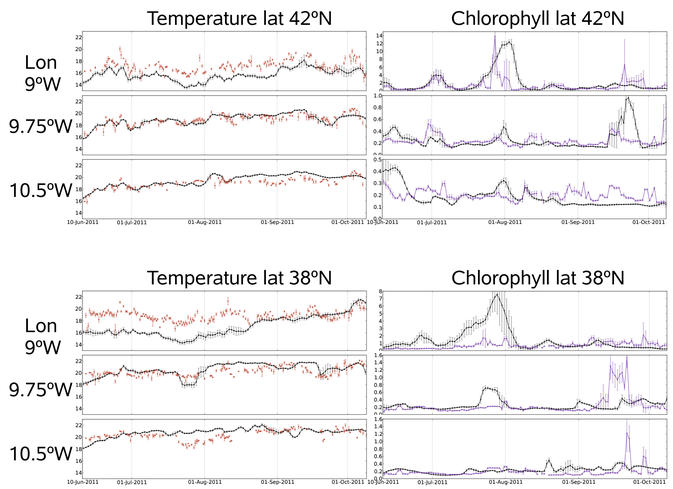


Chlorophyll, model vs satellite (IFREMER)



Model bias $(M_i-O_i)/O_i$
10-Jun, 10-Oct 2011





Summary

- Model represents the shelf features of the upwelling summer season: circulation, temporal and spatial trends of temperature and chlorophyll
- Model simulated the main summer blooms in the northern shelf
- Summer blooms overestimated by model in the southern shelf
- NPZD Model reproduces base concentration and variability of surface chlorophyll
- In situ measurements and longer periods of observation required for further validation
- Need for a better representation of the wind field, river flow and nutrients concentration
- More complex BGC modules may improve model results
- The regional model should be nested in the nowcasts and forecasts of operational assimilated eddy-resolving global models

References

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