

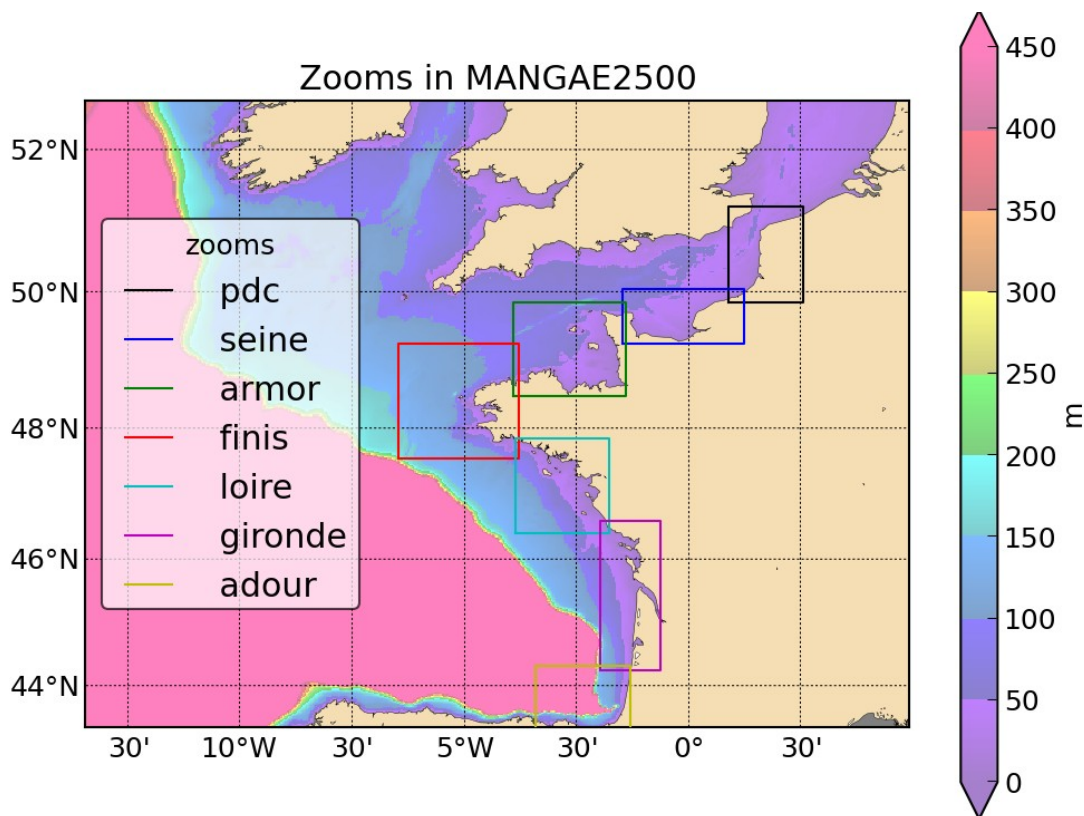
Inter annual hindcast along the French Atlantic coast

Seabed habitats maps are build from statistics models which need some data that describe the physical environment of the different species. Theses environmental factors are the salinity, temperature and shear stress (from waves and current) on the sea floor. Statistics are based on realistic and inter-annual simulations from 3D ocean models.

Models output are currently available at a uniform resolution of 2.5 km along the whole French coast, as a part of the PREVIMER project (<http://www.previmer.org>)

To increase the horizontal resolution of the model to 500m grid spacing, an on-line grid refinement technique has been carried out with the AGRIF library. (<http://www-ljk.imag.fr/MOISE/AGRIF/>)

Seven zooms (with 500m resolution) have been implemented in the 2.5 km MANGAE configuration.



From this configuration, an hindcast of six years has been simulated. The 2.5 km configuration and the seven zooms are computed simultaneously. During the simulation, the big grid (called *mother* grid) provide informations to the seven zooms (also called *child* grids) boundaries. The child grids also give informations back to the mother grid on their common area.

1. Main characteristics of the grids

- *Horizontal resolution* : 500m
- *Vertical resolution* : 40 sigma levels
- *Temporal resolution* : 1 Hour
- *Available variables* :
 - 2D : Sea surface height and barotropic velocities (U and V components)
 - 3D : Temperature, Salinity and baroclinic velocities

2. Features of the simulations

- *Bathymetry* : compilation of data from IFREMER. (100m and 500m gridded data)
- *Boundary forcing* :
 - For the mother grid :T,S from an global ocean model (MERCATOR) + Tide from a 4 km tide model
 - For the child grids boundary conditions come from the mother grid
- *Surface forcing* : Hourly wind and solar flux from ARPEGE model (10km) and AROME (3KM). Both models come from the French meteorological institute (METEOFRACTANCE).
- *Run off* : daily outflows from 84 rivers along the coast
- *Output* : The output format is the NETCDF4 (including HDF5)
 - One directory per zoom (*PDC, SEINE, ARMOR, FINIS, LOIRE, GIRONDE, ADOUR*)
 - In each directory there is another directory per year (2010-2015)
 - One file per hour with the name of the file containing the name of the zoom and the date :
PREVIMER_F1-MARS3D-FINIS_20100501T1200Z.nc
 - There are 2 years recorded on each disk

3. Computing environment of the simulations

All the simulations have been launched on the Ifremer's supercomputer *CAPARMOR* :

- The configuration include the 2.5 km model + the 7 zooms
- Calculations are made on a 15 days cycle : A set of python scripts manage launch and restart of the model every 15 days
- Jobs are launched on 48 nodes using MPI parallelization
- It takes 22 hours to compute 15 days for the entire configurations
- There is 10 minutes of post-processing to format the output files (one file per date and netcdf compression)
- Output size : **1.7 TO** for an entire year