

# WP5 Model MITgcm-Darwin Partner ENEA

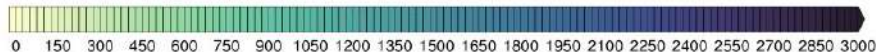
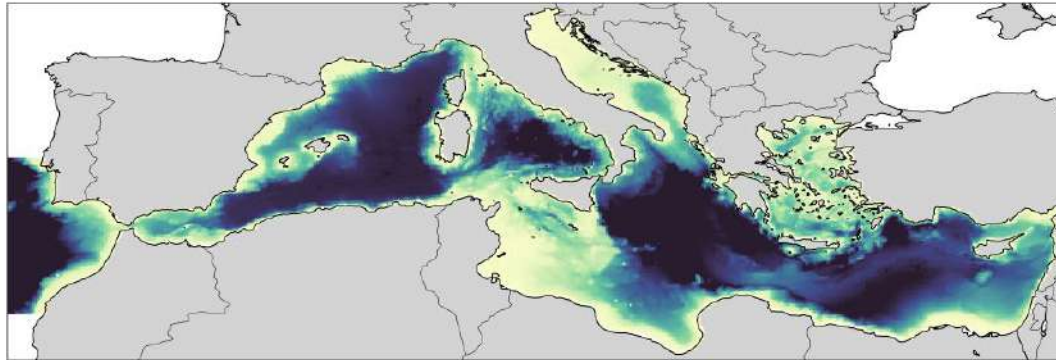
Target basin: Mediterranean Sea

Coupled physical system: MITgcm

Model spatial resolution: 1/12°

Model configuration: stand-alone configuration of MITgcm-Darwin .

MITgcm Bathymetry



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## Model type and complexity

MITgcm: 3D Eulerian grid; finite volume.

DARWIN: Complex trait-based ecosystem model.

## Main processes represented

MITgcm: Advection, diffusion, convection, and air-sea interactions.

DARWIN: Biological processes (e.g., photosynthesis, nutrient uptake, grazing, mortality, and sinking) + main bio-associated element cycles (i.e., C, N, P, Si, Fe, O<sub>2</sub>)

## State variables

MITgcm: Velocity ( $u$ ,  $v$ ,  $w$ ), temperature ( $T$ ), salinity ( $S$ ), pressure ( $p$ ), and sea surface height ( $\eta$ ).

Darwin: 36 state variables, including nutrients (e.g. NO<sub>3</sub>, NH<sub>4</sub>, PO<sub>4</sub>, NO<sub>2</sub>, FeT, SiO<sub>2</sub>), carbonate system (e.g., DIC, ALK), O<sub>2</sub>, dissolved and particulate organic matter (e.g., DOC, POC), 6 PFTs (in C and Chl) and 4 ZFTs (in C)

# WP5 Model ENEA-REG-BGC Partner ENEA

ENEA-Reg-BGC graphical representation:

**Proposed key variables for the climate services:**

Primary production, PFT biomass and distribution, FCO<sub>2</sub>, pH, water quality (nutrients and O<sub>2</sub>)

**Planned development and innovation introduced in Rivierade:** implementation of biogeochemistry in the regional coupled ENEA-REG model using the Darwin module.

