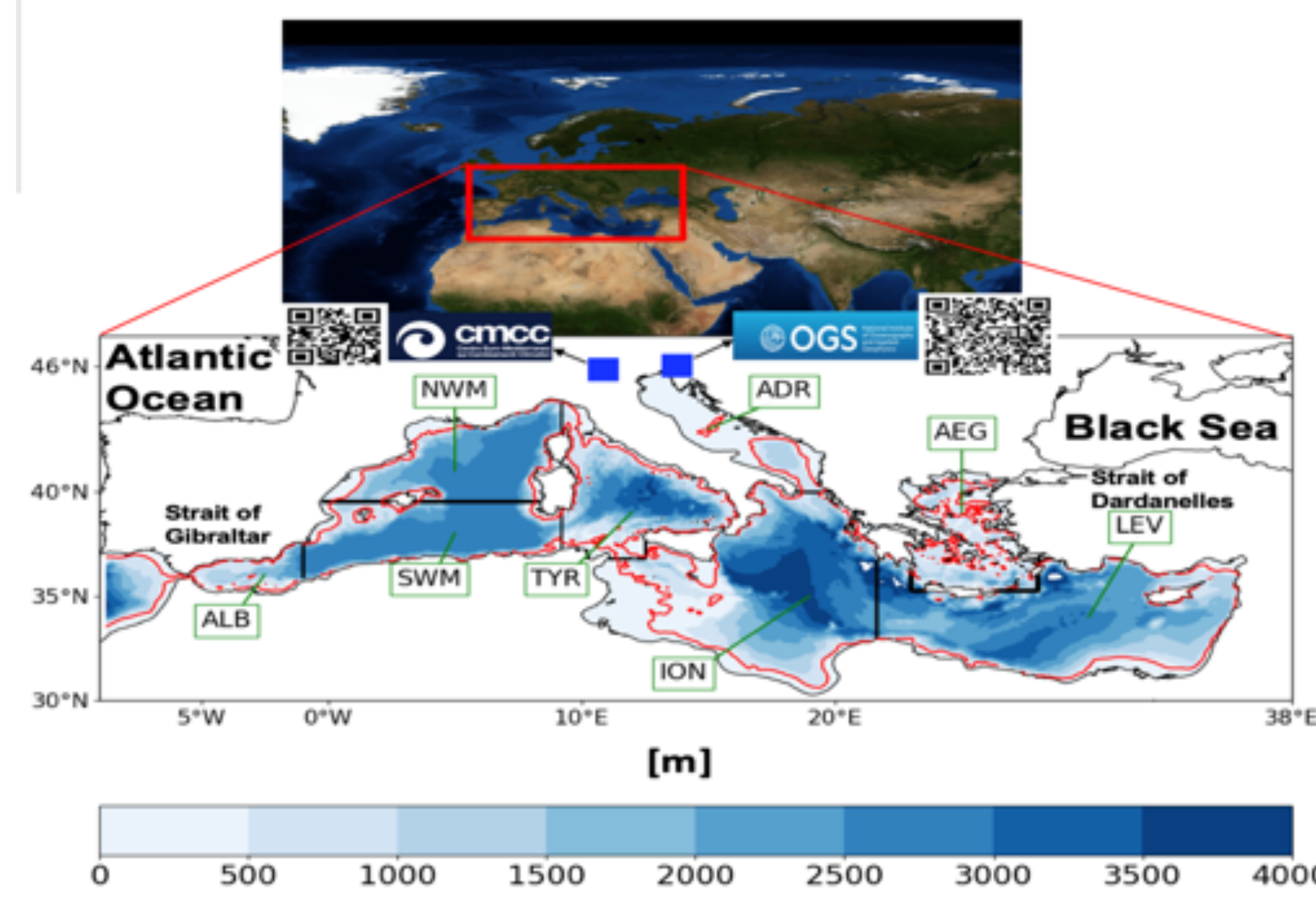


Assessing marine ecosystems and carbon budget response to climate change in the Mediterranean along the 21st century: an analysis using eddy resolving projections under RCP4.5 and RCP8.5 emission scenarios

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The Mediterranean Sea

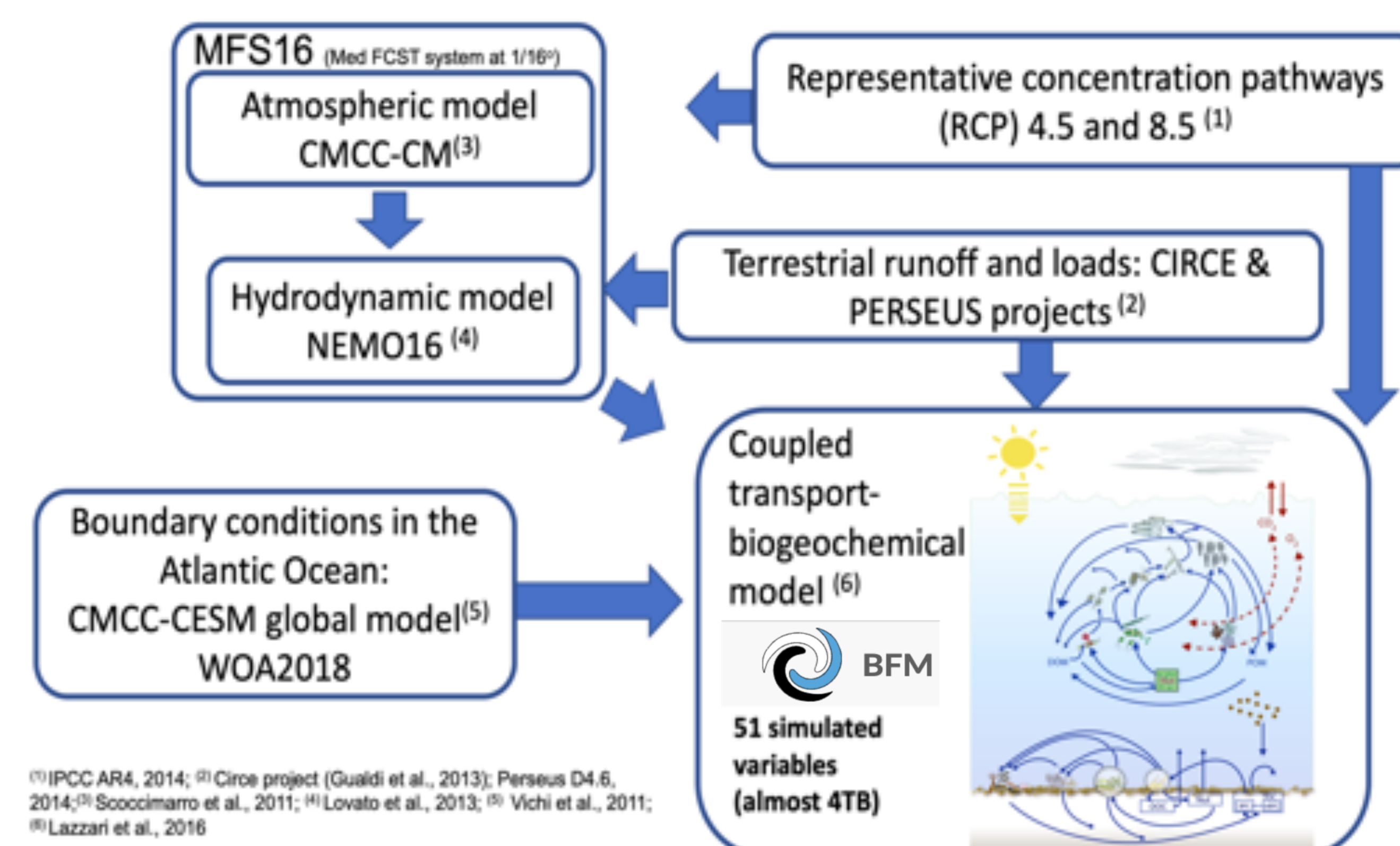


The Mediterranean Sea is an oligotrophic basin widely recognized as an hot-spot for climate change

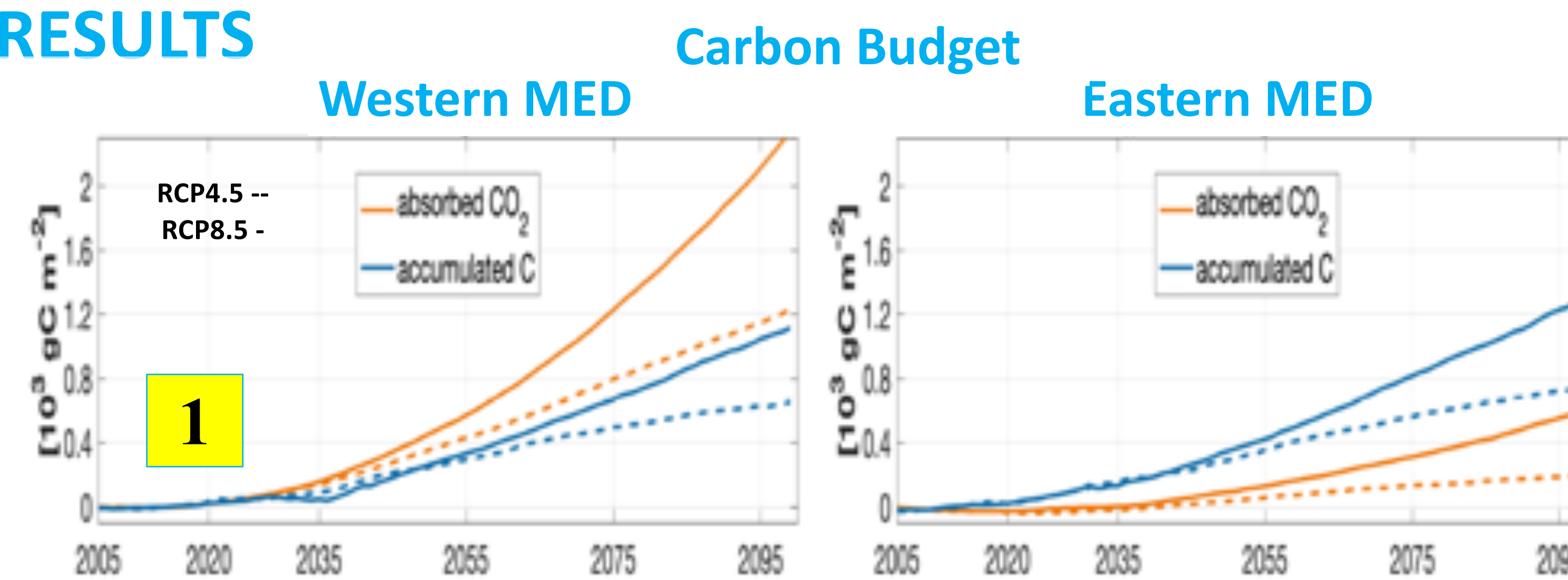
It is characterized by:

- a low level of net primary production with respect to the global ocean and a peculiar west-east trophic gradient
- high level of marine biodiversity and strong anthropic pressures on the marine ecosystems

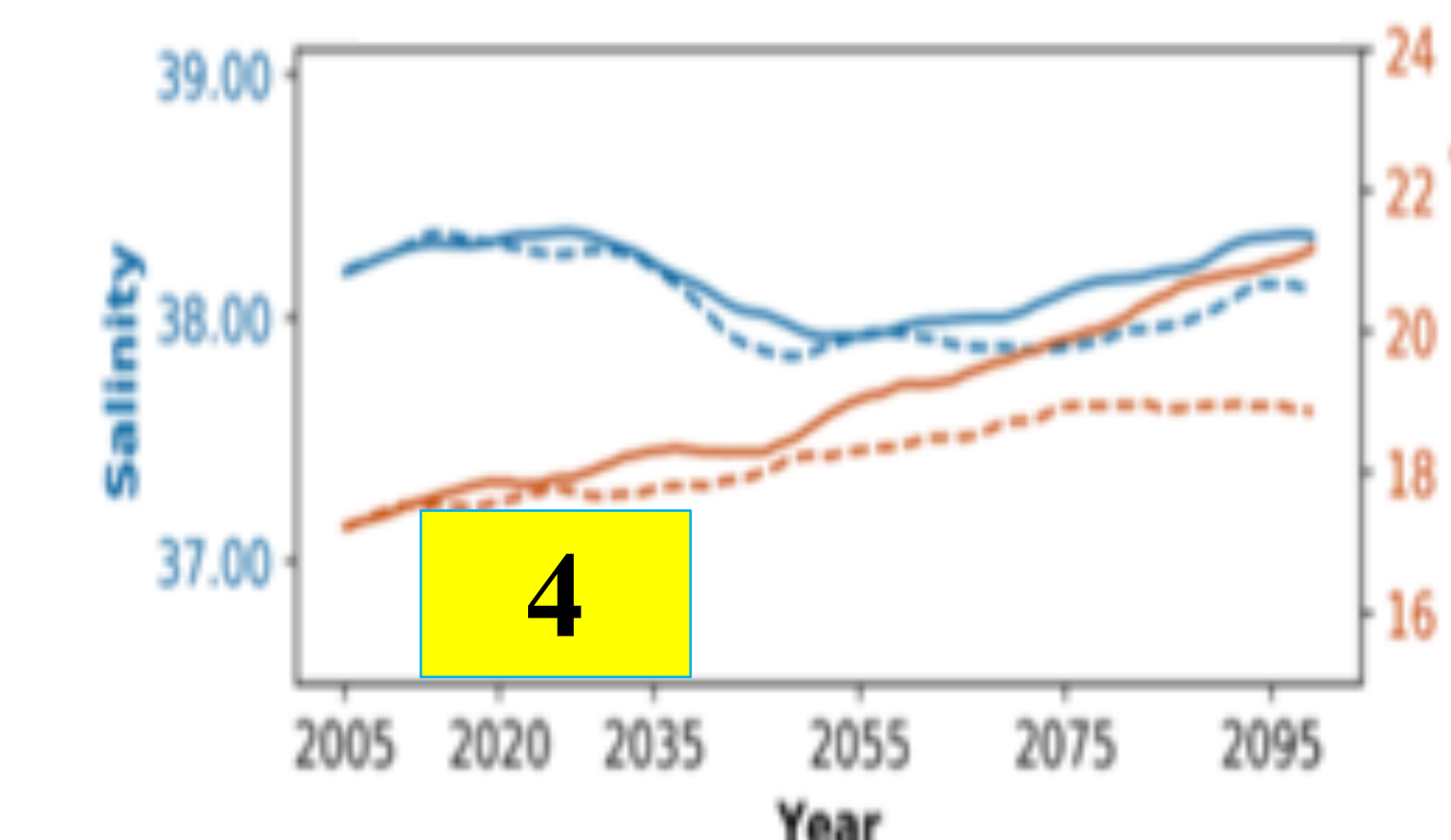
Modeling framework



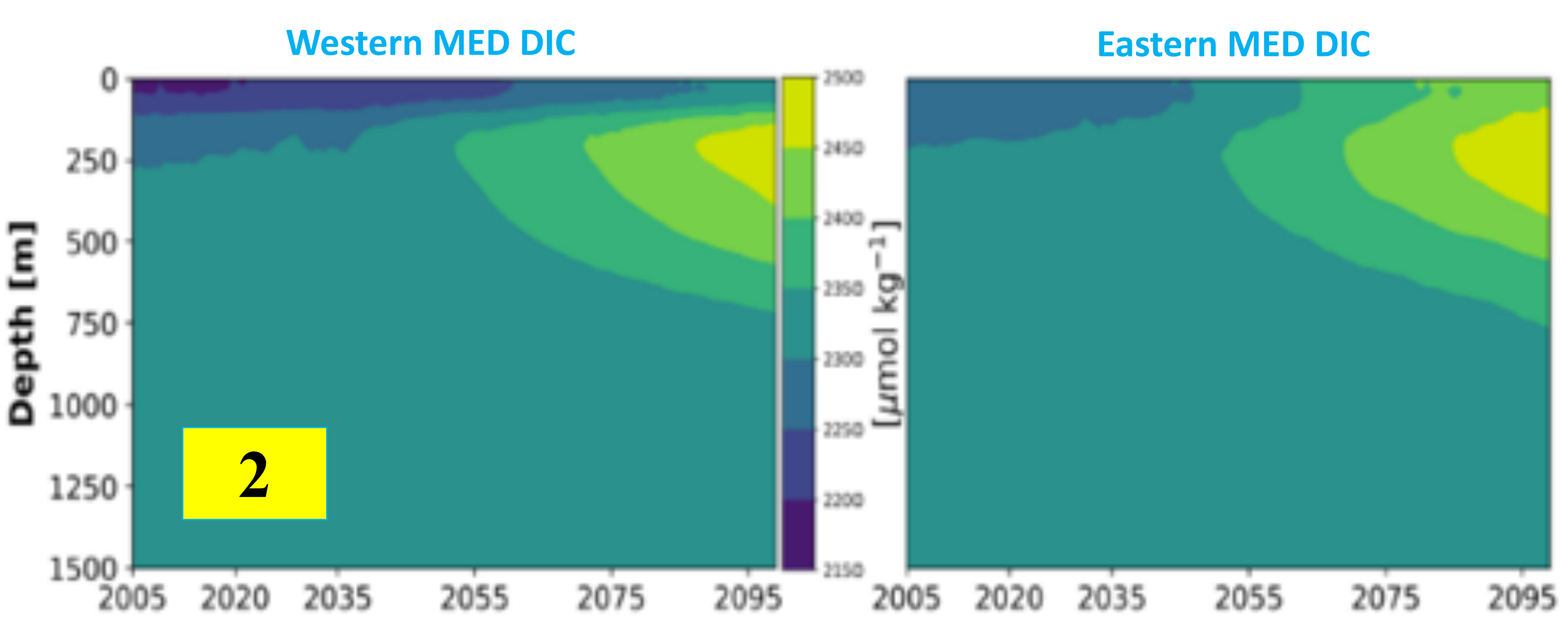
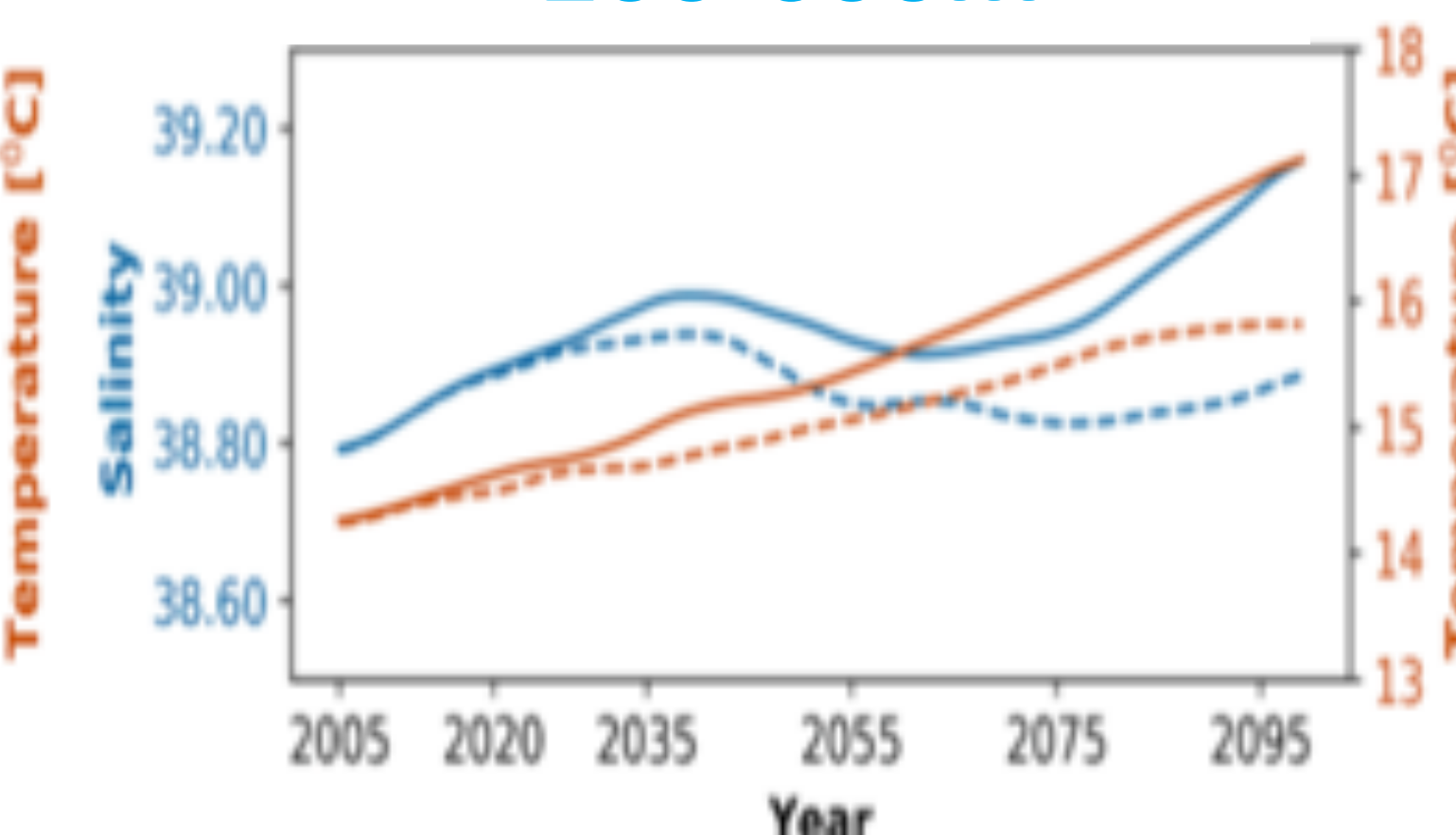
RESULTS



Temp MED 0-100m

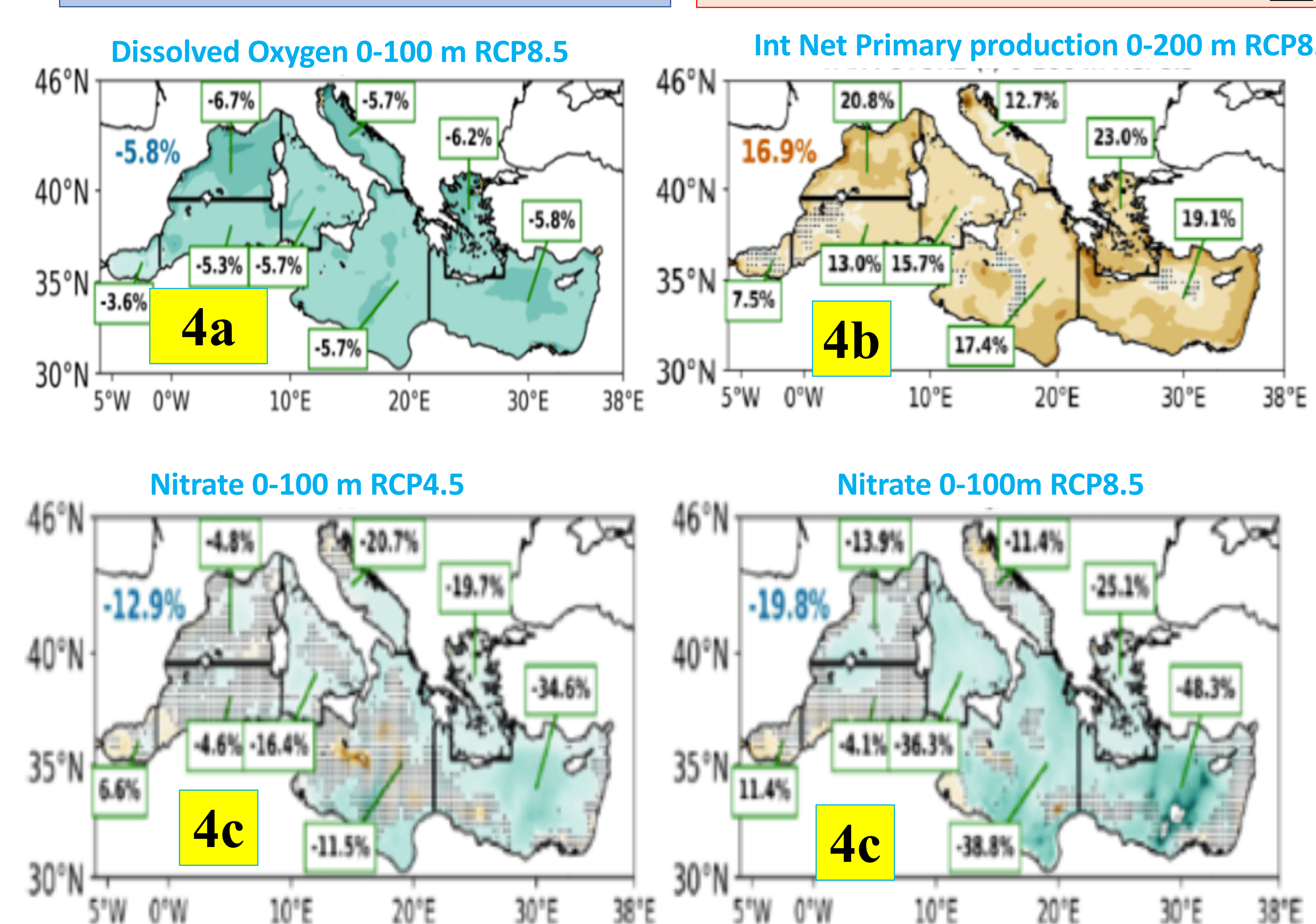
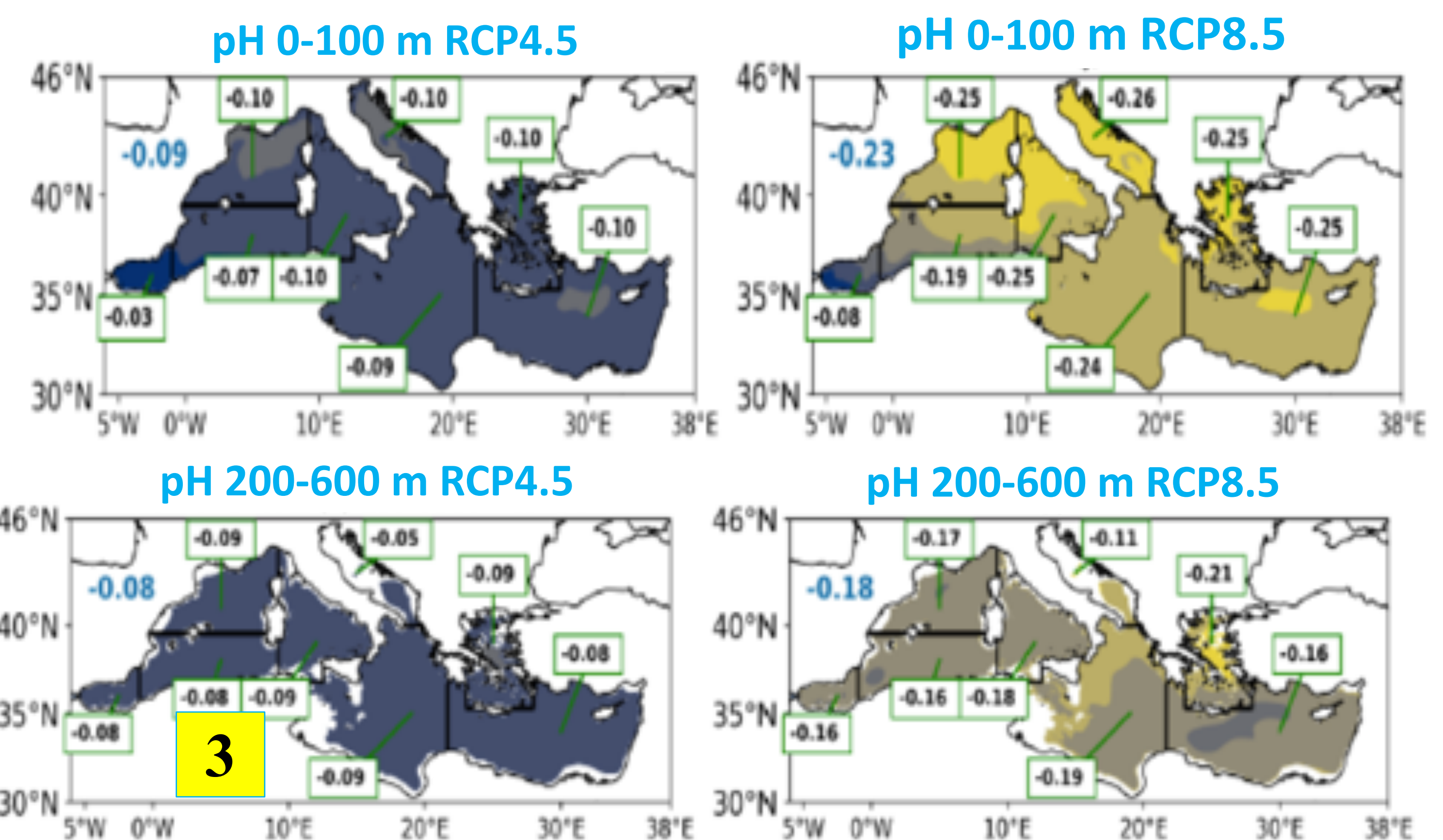


Temp MED 200-600m



- Oxygen solubility
- Living Biomass

- Net Primary production
- Ecosystem respiration



1. Different amount of atmospheric CO₂ adsorbed/stored in Western/Eastern Mediterranean
2. Progressive penetration of inorganic carbon along the water column
3. Overall acidification of the water column
4. Warming of the water column with significant effects on oxygen content (4a), living biomass and metabolic processes (4b) and nutrient content (4c)

Next Steps

- Regional Earth System Models for the physics (Med-Cordex)
- Assessment of the sensitivity of the projections to the river inflow and atmospheric deposition
- R&D evolution in the frame of NextGenEU projects (National Centre for HPC - ICSC, TeRABIT, RETURN)

Data availability



Reale, M., et al.: 2022 Acidification, deoxygenation, and nutrient and biomass declines in a warming Mediterranean Sea, Biogeosciences, 19, 4035–4065

