REQUEST FOR ADDITIONAL RESOURCES IN THE CURRENT YEAR FOR AN EXISTING SPECIAL PROJECT

Please email the completed form to special_projects@ecmwf.int.

MEMBER STATE: SPAIN

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Other researchers: Aude Carreric, Pablo Ortega, Miguel Castrillo, Pierre-Antoine Bretonnière, Eric Ferrer, Roberto Bilbao, Juan Acosta Navaro, Vladimir Lapin

Project title: High-resolution ocean reconstructions for initializing decadal climate predictions

Project account: **SPESICCF**

Additional computer resources requested for		**03/10/22**
High Performance Computing Facility	(units)	5 M
Data storage capacity (total)	(Gbytes)	

Continue overleaf

[1] The Principal Investigator is the contact person for this Special Project

Technical reasons and scientific justifications why additional resources are needed

The goal of this project is to produce 5 members of high-resolution oceanic reconstructions, using the NEMO3.6 ocean model, driven by ERA5 surface atmospheric forcings and assimilating sea temperature and salinity at the surface from ORAS5 and 3D ocean temperature and salinity from the EN4 analysis. The overall objective is to use this reconstruction to provide the initial conditions for a decadal prediction system with EC-Earth3 in its high-resolution configuration.

As mentioned in the mid-project progress report, we encountered several technical issues when setting up the experiment. In particular, we realised that we were using an outdated routine on the ECMWF Cray XC40 HPC to save the initial conditions (IC), which are required for the next step of the overall project. We produced a first member, which allowed us to realise that this routine dedicated to saving the IC from the ocean-only experiment was generating IC files which were not readable by the coupled version of the model used to make the predictions.

In the meantime, we corrected the ERA5 precipitation forcing flux that we were wrongly imposing to the reconstruction (see also the progress report).

Because of the aforementioned problems, we decided to produce again the first member and, in parallel, we have launched 4 other reconstruction members, as initially planned, which differ from each other only by the use of slightly different starting conditions and by perturbations introduced in their corresponding atmospheric forcing. With a slightly lower consumption of cores per simulated year (CPSY) than initially estimated and very few numerical errors, we were able to produce almost all of our 5 members. However, with the initial allocation we will be unable to run about 27 simulated years distributed over the last 4 members. To fully complete them, and thus be able to produce initial conditions until the year 2021, we estimate that we need 27 years * 170000 SBU = 4.59 M SBU computing hours, plus a 10% margin of error, for a total of 5 M SBU.