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

MEMBER STATE: FRANCE

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Project title: Improvement of the barotropic tide in the 1/12° global ocean NEMO model

Project account: SPFRMORE

Additional computer resources requested for 15/05/2020

<table>
<thead>
<tr>
<th>Resource</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Performance Computing Facility</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Data storage capacity (total) (Gbytes)</td>
<td>0</td>
</tr>
</tbody>
</table>

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

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This form is available at: http://www.ecmwf.int/en/computing/access-computing-facilities/forms
Technical reasons and scientific justifications why additional resources are needed

This project is based on the global configuration at 1/12° named MFC-GLO used in CMEMS. The goal is to introduce, validate and improve the modeling of barotropic tides in the general circulation of the global ocean, at high resolution. It is a time consuming configuration especially since we explicitly solve the barotropic tides. In particular, we had to reduce the time barotropic time step to improve their representation in the model. This induced a cost we did not expect at the beginning of the project.

As planned in the project, we implemented a new parameterization of the internal wave drag in order to well specify the dissipation due to internal waves in the model. This new parameterization generated numerical instabilities that we were only able to kill by using a smaller baroclinic time step (180 s instead 360 s usually).

Smaller time steps lead to a larger computational cost which is the main reason why we exceeded our SBU quota already.

In addition, in order to valid the tide solution (Tide gauges, HF radar, altimeter data) in a ocean model, a minimum of 40 days of computation is needed.

In order to perform the final tests and simulations, we need 2,000,000 additional SBU.

We hope it will be possible to extend our quota.

Many thanks in advance for your help and your answer.

With my very best regards,

Yves Morel