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

MEMBER STATE: CROATIA

Principal Investigator[1]: Cléa Denamiel

Affiliation: Institute of Oceanography and Fisheries (IOF)

Address: Šetalište I. Meštrovića 63,
21000 Split, Croatia

E-mail: cdenamie@izor.hr

Other researchers: Ivica Vilibić (IOF); Ivica Janeković (University of Western Australia); Samuel Somot (Météo-France / CNRM-GAME); Manuel Bensi and Vedrana Kovačević (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale – OGS); Ivan Güttler (Meteorological and Hydrological Service – DHMZ) ; Darko Koračin (Faculty of Science of the University of Split, Croatia)

Project title: The Adriatic decadal and inter-annual oscillations: modelling component

Project account: **SPCRDENA**

Additional computer resources requested for	2019
High Performance Computing Facility (units)	8,400,000
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 physical explanation of the thermohaline oscillations of the Adriatic-Ionian System (BIOS) is still under debate as they are thought to be generated by either pressure and wind-driven patterns or dense water formation travelling from the Northern Adriatic. The aim of the ADIOS project (currently funded for the next two years) is to numerically investigate and quantify the processes driving the inter-annual to decadal thermohaline variations in the Adriatic-Ionian basin with a high resolution Adriatic-Ionian fully coupled atmosphere-ocean model.

Within the second year of the special project (spcrdena), the Adriatic-Ionian model finished to run for the historical period 1987-2017 on the ECMWF supercomputing facilities. This model consists in two nested atmospheric grids of 15-km and 3-km and two nested ocean grids of 3-km and now has to be run a 30-year period under RCP scenario (2070-2100) via a surrogate climate change method (Schär et al., 1996).

Due to the high resolution of the grids (up to 3-km for the atmosphere and 1-km for the ocean), the optimal configuration was found to produce a month of model results per day. Each 30-year long simulation thus require a full year elapse time to be produced. In addition, the total amount of SBUs needed to continuously run the model during one year is: 230CPUs*365days*86400s*P ~ **33,000,000 SBUs**.

Due to a misinterpretation of the ECMWF regulations only **13,000,000 SBUs** were asked per year in the special project. It means that the special project only covers about 5 months of simulation per year (= per 30-year long simulation) and all the credits of the special project were already spent in May 2019. However, as for the previous year, thanks to the support of the Croatian Hydrological and Meteorological Services, the missing resources were covered by the ECMWF Croatian account quota and the evaluation run (1987-2017) is now completed. High resolution climate modelling at the coastal scale is currently under development (for example within the MEDCORDEX initiative) and is not state of the art, the project is thus facing some understandable technical challenges including, principally, the stretch in numerical resources needed to run such a model. As the rcp 8.5 scenario run should start without delay (due to the slowness of the simulation), similarly to last year, we would like to know if additional credits are available before the end of 2019, and if possible, we would like to request 3 months of additional resources: 230CPUs*92days*86400s*P ~ **8,400,000 SBUs**.

Schär, C., Frei, C., Lüthi, D., Davies, Huw C. (1996). Surrogate climate-change scenarios for regional climate models. Geophysical Research Letters, 23 (6). https://doi.org/10.1029/96GL00265