

(UPDATED) REQUEST FOR A SPECIAL PROJECT 2026–2028

MEMBER STATE: Greece
Principal Investigator¹: Vassilios D. Vervatis
Affiliation: National and Kapodistrian University of Athens
Address: Ocean Physics And Modelling group, Section of Environmental Physics
– Meteorology, Department of Physics
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Project Title: Mediterranean Sea Climate Response (MEDCLIM-R)

To make changes to an existing project please submit an amended version of the original form.)

If this is a continuation of an existing project, please state the computer project account assigned previously.	SPGRVER2	
Starting year: (A project can have a duration of up to 3 years, agreed at the beginning of the project.)	2026	
Would you accept support for 1 year only, if necessary?	YES ☒	NO ☐

Computer resources required for project year:	2026	2027	2028
High Performance Computing Facility [MSBU]	28	36	34
Accumulated data storage (total archive volume) ² [TB]	60	120	200

EWC resources required for project year:	2026	2027	2028
Number of vCPUs [#]			
Total memory [GB]			
Storage [GB]			
Number of vGPUs ³ [#]			

Continue overleaf.

¹ The Principal Investigator will act as contact person for this Special Project and, in particular, will be asked to register the project, provide annual progress reports of the project's activities, etc.

² These figures refer to data archived in ECFS and MARS. If e.g. you archive x GB in year one and y GB in year two and don't delete anything you need to request x + y GB for the second project year etc.

³ The number of vGPU is referred to the equivalent number of virtualized vGPUs with 8GB memory.

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Extended abstract

All Special Project requests should provide an abstract/project description including a scientific plan, a justification of the computer resources requested and the technical characteristics of the code to be used. The completed form should be submitted/uploaded at <https://www.ecmwf.int/en/research/special-projects/special-project-application/special-project-request-submission>.

Following submission by the relevant Member State the Special Project requests will be published on the ECMWF website and evaluated by ECMWF and its Scientific Advisory Committee. The requests are evaluated based on their scientific and technical quality, and the justification of the resources requested. Previous Special Project reports and the use of ECMWF software and data infrastructure will also be considered in the evaluation process.

Requests exceeding 5,000,000 SBU should be more detailed (3-5 pages).

Revised Resource Allocation and Multi-Year Justification (2027–2028)

To successfully execute the full scientific scope of the EU-INTERCHANGE project over its remaining lifecycle, we have revised and shifted our resource allocation for the upcoming years. A comprehensive technical and scientific justification for the additional resources is detailed in the submitted 2026 progress report.

The table below outlines the structural shift from our initial proposal to our revised requirements.

Year	Initial MSBU	Proposed MSBU	Initial Storage (TB)	Proposed Storage (TB)
2026 (Current)	23	28	40	60
2027	22	36	25	60
2028	20	34	20	80
Total Project Lifecycle	65	98	85	200

Extended Abstract Justification for the Structural Shift

1. Computational Resource Scaling (~98 MSBU Total Framework)

The initial proposal underestimated the rigorous computational demands of a 3-way online-coupled modeling system (NEMOv5-PISCESv2-WW3) via the OASIS3-MCT coupler. Benchmarking completed during the 2026 optimization phase revealed the following baseline resource requirements:

- The coupled ocean-biogeochemistry component (NEMO-PISCES) scales to a 4x cost increase over stand-alone ocean runs (~0.4 MSBU per simulation year).
- The stand-alone wave model (WW3) requires ~0.3 MSBU per simulation year.

- Managing the 3-way exchange via OASIS adds an explicit coupling overhead of ~0.17 MSBU per simulation year.

To fulfill the scientific objectives of EU-INTERCHANGE, our 2027 and 2028 plans feature an expanded experimental matrix. This includes not only the core 3-way coupled production runs but also a suite of supplementary sensitivity experiments (selective deactivation of coupling components) and runs utilizing CERRA atmospheric forcing. A standard 5% contingency buffer is also included to manage queue overheads and potential system failures.

2. Storage Footprint Expansion (~200 TB Total Framework)

The sharp increase in data storage requirements for 2027 (60 TB) and 2028 (80 TB) directly reflects the high-resolution archival demands of the climate production phase. To validate our models against Copernicus Marine forecasting datasets and provide meaningful outputs for regional climate downscaling, we must archive a large multi-variable matrix (5 ocean physics variables, 17 wave variables, and 21 biogeochemical variables).

During the hindcast and CMIP6 regional climate projection phases executed across 2027 and 2028, these variables must be archived at high frequencies (hourly for waves, daily for ocean states, and 5-day to monthly intervals for biogeochemistry), resulting in the revised cumulative storage requirement of 200 TB.