SPECIAL PROJECT PROGRESS REPORT

All the following mandatory information needs to be provided. The length should *reflect the complexity and duration* of the project.

Reporting year	2020
Project Title:	PSAS Data Assimilation for the Adriatic Sea using Regional Ocean Modelling System (ROMS)
Computer Project Account:	spcrjane
Principal Investigator(s):	Ivica Janekovic
Affiliation:	ZIMO, Rudjer Boskovic Institure, Bijenicka c 54, 1000 Zagreb, Croatia. Current affiliation:OGS, The University of Western AustraliaCnr Fairway and Service Road 4, M470Crawley WA 6009,Australia.
Name of ECMWF scientist(s) collaborating to the project (if applicable)	hr1e - Clea Lumina Denamiel
Start date of the project:	Jan 2018
Expected end date:	Jan 2021

Computer resources allocated/used for the current year and the previous one
(if applicable)
Please answer for all project resources

		Previous year		Current year	
		Allocated	Used	Allocated	Used
High Performance Computing Facility	(units)	900000	640595	900000	1035546 (115%)
Data storage capacity	(Gbytes)	4500	4500	4500	4500

Summary of project objectives (10 lines max)

After successfully applied 4D-Var DA in ROMS (Regional Ocean Modeling System) we published Ocean Modelling Journal paper (Using multi-platform 4D-Var data assimilation to improve modelling of the Adriatic Sea dynamics) proving multiple benefits of a 4D-Var data assimilation technique for improving estimate of the ocean dynamics in the Adriatic Sea. Used atmospheric forcing originated from the ALADIN regional model, which in the future, we would like to improve by comparing and incorporating ocean computed corrections. As ALADIN is not "free public" model an successful attempt was made using WRF-ARW modelling system.

Summary of problems encountered (10 lines max)

Setup of WRF-ARW model at the ECMWF was resolved with great help from the ECMWF staff (Bojan Klasnic). Additional storage was requested to store WRF model results.

Summary of plans for the continuation of the project (10 lines max)

Using WRF-ARW seems as promising direction; a) it is public domain model, b) easy to run, c) have already coupled with ROMS model and d) is implement/supported on the ECMWF supercomputer. Connecting WRF and ROMS inside 4D-Var data assimilation is something new, not already done (there is 2 way coupled system COAWST for ROMS and WRF but not using 4D-Var DA). In that sense corrections from the ocean model assimilation part would be sent back to the WRF-ARW where assimilation is not an easy task.

List of publications/reports from the project with complete references

Janeković, I., Mihanović, H., Vilibić, I., Grčić, B., Ivatek-Šahdan, S., Tudor, M., & Djakovac, T. (2020). Using multi-platform 4D-Var data assimilation to improve modeling of Adriatic Sea dynamics. Ocean Modelling, 146, [101538]. https://doi.org/10.1016/j.ocemod.2019.101538

Summary of results

If submitted **during the first project year**, please summarise the results achieved during the period from the project start to June of the current year. A few paragraphs might be sufficient. If submitted **during the second project year**, this summary should be more detailed and cover the period from the project start. The length, at most 8 pages, should reflect the complexity of the project. Alternatively, it could be replaced by a short summary plus an existing scientific report on the project attached to this document. If submitted **during the third project year**, please summarise the results achieved during the period from July of the previous year to June of the current year. A few paragraphs might be sufficient.

We run one year of 4D-Var DA for the Adriatic Sea, done full analysis of results and published journal paper in the Ocean Modelling Journal. Implementation of the WRF-ARW system at the ECMWF for the Adriatic Sea Region using 2 nested constellations (9-3-1 km) was done with the help of ECMWF staff. System is forced with ECMWF IFS boundary and initial conditions. Prepared ROMS ocean model forcing stream and variables in Registry to be used in the 4DVar DA.