

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 2019

Project Title: AerChemMIP aerosol-specific simulations with EC-Earth

Computer Project Account: spfiodon

Principal Investigator(s): Dr Declan O'Donnell

Affiliation: Finnish Meteorological Institute

Name of ECMWF scientist(s) collaborating to the project (if applicable) -

Start date of the project: 2019 (delayed from 2018)

Expected end date: 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	(SBU)			30 500 000	0
Data storage capacity	(Gbytes)			57 000	0

Summary of project objectives (10 lines max)

The simulations planned for this project form part of the EC-Earth consortium's contribution to AerChemMIP, which is a part of the CMIP6 model intercomparison effort. The experiments are specified in the AerChemMIP protocol and are designed to provide insight into climate forcing of aerosols in the historical period since 1850 and projections of that forcing over the coming decades. It will also assess the contribution of highly uncertain natural aerosol emissions to the overall aerosol effects on climate.

Summary of problems encountered (10 lines max)

The EC-Earth model has been repeatedly delayed. At the time of application for this special project, the release of the atmosphere-ocean GCM was planned for October 2017, with the AerChemMIP configuration to follow within a few months. Instead the first CMIP6 runs with the atmosphere-ocean GCM were started in December 2018, and in the AerChemMIP configuration in February 2019. The first simulations are pre-industrial control runs: however, the AerChemMIP configuration has still not achieved a satisfactory, stable pre-industrial climate and re-tuning efforts are ongoing.

None of the simulations in this special project can be started until the pre-industrial control run is complete, as the starting conditions for historical experiments are taken from the pre-industrial control.

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

The project depends on the completion of the pre-industrial control run with the AerChemMIP configuration of EC-Earth. While simulations are ongoing, it still cannot be stated that any of them will produce a stable pre-industrial climate. Tuning of the AerChemMIP configuration is difficult because of the slow rate of the simulations (~2 simulated years per day). The preindustrial control run could be ready in (at best) October 2019, but could also be several months after that. It is therefore likely that this special project will not be in a position to use the resources that have been allocated to it this year.

List of publications/reports from the project with complete references

None to date

Summary of results

None to date