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   …2021…..…………………………….…….……

Project Title: LARGe ensemble fOrecast and attribution of events (LARGO) .…..……………………………….……

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Computer Project Account: … SPGBNEVE …..…………………………….……

Principal Investigator(s):   … Neven Fuckar …(neven.fuckar@ouce.ox.ac.uk)...……

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Affiliation: University of Oxford, Environmental Change Institute ..

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

Start date of the project: …01.01.2020…………………………….……

Expected end date: …01.01.2022……(or hopefully 01.01.2023)……..……

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)	27 200 000	0	27 200 000	0
Data storage capacity	(Gbytes)	40 000	0	60 000	0

Summary of project objectives (10 lines max)

This special project LARGO (spgbneve) will compare the impacts of the SPPT and SPP perturbed-physics schemes on the ensemble spread, forecast skill, and attribution of extreme events in large ensembles produced with the IFS and/or OpenIFS using numerical single precision (and potentially EC-Eearth3). We are primarily interested in forecasting and attribution of heat waves, droughts, and high precipitation events, so we put the focus on the boreal summers of 2018 and 1976 (the hottest and the second hottest summer in England), as well as the boreal winter and spring of 2020, and the boreal spring and summer of 2021. Our experimental setup (potentially utilizing multiple ECMWF models) will allow us to examine a wide spectrum of extreme events taking place in the selected seasons. We consider different methods for generation of counterfactual ensembles based on ERA5 and CERA-20C that could benefit event attribution science and a quasi-operational attribution system.

Summary of problems encountered (10 lines max)

… The simulation phase of project LARGO has been unfortunately delayed due to the ongoing public health situation, so the planned IFS and/or OpenIFS (and potentially EC-Earth3) runs did not start yet. However, the preliminary use of ERA5 data for the generation of IC of the selected extreme events has commenced and the production runs should start in July or August 2021. Hence, we expect to report the first forecast skill and event attribution assessments in September 2021, with the intention to spend annual SBU allocation as soon as possible this year.
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Summary of plans for the continuation of the project (10 lines max)

…The aim is to catch up with the project timeline as much as possible this year and then hopefully requested one-year extension would enable the completion of the remaining objectives of the proposed project next year. This project represents opportunity to substantially advance event attribution through exploration of an expanding series of extreme events pushing the capability of our prediction systems to the limits and having growing socio-economic relevance in a changing climate.
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List of publications/reports from the project with complete references

…No publication yet……………………………………………………………………………………………………

Summary of results

For the start we make a complementary event attribution of some selected 2018 extreme events using long-term observational records. Such historical attribution based on assumed covariance of extreme statistics with a global climate change parameter provide a challenge and an indirect guidance for explicit modelling attribution based on the historical/actual vs different counterfactual simulations.