

EGU2020-19340

<https://doi.org/10.5194/egusphere-egu2020-19340>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



## Boosting climate change research with direct access to high performance computers

**Maria Moreno de Castro**<sup>1</sup>, Stephan Kindermann<sup>1</sup>, Sandro Fiore<sup>2</sup>, Paola Nassisi<sup>2</sup>, Guillaume Levavasseur<sup>3</sup>, Martin Juckes<sup>4</sup>, Ag Stephens<sup>4</sup>, Karsten Peters<sup>1</sup>, Sophie Morellon<sup>3</sup>, and Sylvie Joussaume<sup>3</sup>

<sup>1</sup>DKRZ German Climate Computer Center, Germany

<sup>2</sup>CMCC Euro-Mediterranean Center on Climate Change, Italy

<sup>3</sup>IPSL Institute Pierre Simon Laplace, France

<sup>4</sup>STFC Science and Technology Facilities Council, UK

Earth System observational and model data volumes are constantly increasing and it can be challenging to discover, download, and analyze data if scientists do not have the required computing and storage resources at hand. This is especially the case for detection and attribution studies in the field of climate change research since we need to perform multi-source and cross-disciplinary comparisons for datasets of high-spatial and large temporal coverage. Researchers and end-users are therefore looking for access to cloud solutions and high performance compute facilities. The Earth System Grid Federation (ESGF, <https://esgf.llnl.gov/>) maintains a global system of federated data centers that allow access to the largest archive of model climate data worldwide. ESGF portals provide free access to the output of the data contributing to the next assessment report of the Intergovernmental Panel on Climate Change through the Coupled Model Intercomparison Project. In order to support users to directly access to high performance computing facilities to perform analyses such as detection and attribution of climate change and its impacts, the EU Commission funded a new service within the infrastructure of the European Network for Earth System Modelling (ENES, <https://portal.enes.org/data/data-metadata-service/analysis-platforms>). This new service is designed to reduce data transfer issues, speed up the computational analysis, provide storage, and ensure the resources access and maintenance. Furthermore, the service is free of charge, only requires a lightweight application. We will present a demo on how flexible it is to calculate climate indices from different ESGF datasets covering a wide range of temporal and spatial scales using cdo (Climate Data Operators, <https://code.mpimet.mpg.de/projects/cdo/>) and Jupyter notebooks running directly on the ENES partners: the DKRZ (Germany), JASMIN (UK), CMCC(Italy), and IPSL (France) high performance computing centers.