



Contribution ID: 5

Type: **Oral presentation**

## Challenges and needs of reproducible workflows of Open Big Weather and Climate data

*Monday, 14 October 2019 14:50 (20 minutes)*

ECMWF offers, also as operator of the two Copernicus services on Climate Change (C3S) and Atmosphere Monitoring (CAMS), a range of open environmental data sets on climate, air quality, fire and floods.

Through Copernicus, a wealth of open data is being made available free and open and a new range of users, not necessarily 'expert' users, are interested in exploiting the data.

This makes the reproducibility of workflows particularly important. A full, free and open data policy is vital for reproducible workflows and an important prerequisite. Reproducibility however has to be reflected in all aspects of the data processing chain. The biggest challenge is currently a limited data 'accessibility', where 'accessibility' means more than just improving data access. Accessibility aspects are strongly linked with being reproducible and

require improvements / developments along the entire data processing chain, including the development of example workflows and reproducible training materials, the need for data standards and interoperability, as well as developing or improving the right open-source software tools.

The presentation will go through each step of some example workflows for open meteorological and climate data and will discuss reproducibility and 'accessibility' challenges and future needs that will be required in order to make open meteorological and climate data fully accessible and reproducible.

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**Track Classification:** Workshop: Building reproducible workflows for earth sciences