

The Essential Climate Variables programme in the Copernicus Climate Change Service (C3S)

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The Copernicus Climate Change Service (C3S) is one of the six thematic services of the EU-funded Earth Observation programme Copernicus, managed by the European Commission (EU). C3S is implemented by the European Centre for Medium-Range Weather Forecasts (ECMWF), and it has as primary objective providing access to authoritative climate information in support of climate adaptation and mitigation policies of the EU.

C3S supports the implementation needs of the Global Climate Observing System (GCOS) and in turn, the objectives of the United Nations Framework Convention on Climate Change (UNFCCC), by assuring timely access to a large number of quality assured Climate Data Records (CDRs) of Essential Climate Variables (ECVs) derived from space-based Earth observations. In total, GCOS specifies a total of 54 ECVs which are critical to characterize the climate system (relevant), measured globally with existing technologies (feasible) and at an affordable level of investment (cost-effective). C3S has already implemented services for 22 of these land, ocean and atmosphere ECVs. Target requirements for most of the CDRs of ECV products, in terms of uncertainty, stability, temporal and spatial resolution, are based on the framework defined in the GCOS 2016 Implementation Plan (GCOS-IP 2016). However, the ECV services implemented in C3S have proven that target requirements are not always attainable with the current technology, what in turn also provides a valuable feedback for the upcoming update of the 2022 GCOS-IP.

C3S has recently finalized the successful implementation of the first phase of ECV services with access to data and associated information products through the C3S Climate Data Store (CDS). The CDS offers open and free access to an evolving catalogue of climate data products about data of the past, present and future, as well as tools to enable their use. The CDS counts already more than 100,000 registered users. It currently offers access to ECV products associated with 22 ECVs. Each data product provides state-of-the-art reliable access to quality-assured and regularly updated CDRs and Interim CDRs with global or near-global coverage, as well as comprehensive supportive documentation. In addition, an independent evaluation of the data products and associated services assures their quality and roadmap towards target requirements. Also, the implementation of a series of online applications or data viewers provides simple examples of the use of the data accessible through the CDS for climate purposes.

In this presentation we will show the status of the C3S ECV services in the first year of Copernicus 2 (COP 2), we will provide an overview of their main individual components and the plans of these services for the whole COP 2 period, between 2021-2027.