



## **Supporting Climate Services in Europe: the Copernicus Climate Data Store Toolbox**

Cedric Bergeron, Baudouin Raoult, and Angel Lopez Alos

ECMWF, European Centre for Medium-Range Weather Forecasts

Copernicus is a European system for monitoring the Earth. The European Commission (EU) has entrusted ECMWF with the implementation of the Copernicus Climate Change Service (C3S). The Copernicus Climate Change service shall provide information to increase the knowledge base to support adaptation and mitigation policies.

The Climate Data Store (CDS) constitutes the first building block of the C3S and will be at the heart of the C3S infrastructure. It shall, in particular, contribute to the provision of Essential Climate Variables (ECVs), climate analyses, projections and indicators at temporal and spatial scales relevant to adaptation and mitigation strategies for various sectoral and societal benefit areas. The CDS will be designed as a distributed system, providing improved access to existing databases via a one-stop shop, generating and maintaining a documented European catalogue.

One of the major component of the CDS is to provide a set of generic software (the Toolbox) that will allow the users to develop web based applications that will make use of all the datasets available in the CDS. The variety of volumes, data types, formats and structures makes their combined use highly challenging. The Toolbox will hide the physical location of the datasets, their access methods, formats, units, etc. from those who are developing applications. Application developers will be presented with an abstract view of all the data available in the CDS. The Toolbox will provide a series of tools that will perform basic operations on the datasets, such as differences or re-gridding, as well as statistical computations such as means or standard deviations; tools can then be combined into more elaborated workflows, and present there results graphically on the CDS web site.

The Copernicus Climate Change Service will benefit from the state of the art data analysis tools to generate the reference applications required to analyse, monitor and predict the patterns of both the climate drivers and impacts. It must accommodate the needs of the highly diverse set of users that will also include, experts and scientists