Geophysical Research Abstracts
Vol. 21, EGU2019-11631, 2019
EGU General Assembly 2019
© Author(s) 2019. CC Attribution 4.0 license.

The Copernicus Climate Change Service (C3S) contribution to Earth Observation Activities

Joaquin Muñoz-Sabater (1), Rob Allan (2), Bill Bell (1), Iskander Benhadj (3), Paul Berrisford (1), Dick Dee (1), Rossana Dragani (1), Hans Hersbach (1), Rainer Hollman (4), Richard Kidd (5), Jean François Legeais (6), Thomas Popp (7), Pascal Prunet (8), Dinand Schepers (1), Jörg Schultz (9), Cornel Soci (1), Paul van der Linden (2), Gerard van der Schrier (10), and Jean-Noël Thépaut (1)

(1) ECMWF, Reading, United Kingdom, (2) Met Office, Exeter, United Kingdom, (3) VITO NV, Mol, Belgium, (4) DWD, Offenbach, Germany, (5) EODC, Vienna, Austria, (6) CLS, Ramonville-Saint-Agne, France, (7) DLR, Cologne, Germany, (8) SPASCIA, Ramonville-Saint-Agne, France, (9) EUMETSAT, Darmstadt, Germany, (10) KNMI, De Bilt, The Netherlands

The Copernicus Climate Change Service (C3S) of the European Commission combines observations of the Earth System with state-of-the-art science to develop and make available authoritative and quality-assured data about the past, present and future climate, both in Europe and worldwide. The portfolio of service products includes the generation of Climate Data Records (CDRs) of Essential Climate Variables (ECVs) based on Earth Observation (EO) sensors and in-situ observations, reprocessing of Fundamental CDRs and data rescue activities.

Monitoring ECVs over long-term periods covering a minimum of several decades is crucial, as they provide empirical evidence needed to understand the evolution of climate. C3S is currently producing global gridded CDRs of 22 ECVs divided in five themes: atmospheric physics, atmospheric composition, ocean, land hydrology and cryosphere and land biosphere. Several expert European consortia use advance methods to generate timely, consistent CDRs of ECVs with the satellite data record. Methodologies include inter-sensor calibration, data harmonization and bias correction. This view of climate by remote observations is complemented with the generation of gridded CDRs of ECVs for the European domain, from 1950, based on surface in-situ data. These activities support the work of international bodies such as the UNFCCC and the IPCC.

Another activity for climate monitoring based on EO data is the comprehensive reprocessing of satellite data records from the satellite era (1979-). They can be used with climate models or reanalysis to accurately describe the climate of the past. C3S supports activities encompassing the reprocessing of infrared and microwave sounding radiances; radio occultation and scatterometer data, as well as geostationary radiances and atmospheric motion vectors derived from GEO and LEO satellites. In addition, C3S is engaged in the rescue, assessment and characterisation of new data from the early satellite era (dating back to the late 1960s).

This presentation will provide an overview and current status of the above activities, as well as the main methodologies used in the service.