

The Evaluation and Quality Control of Observational ECVs for the Copernicus Climate Service

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The Climate Data Store (CDS) is a cornerstone of the new Copernicus Climate Change Service. The CDS will collect and make available to a wide range of users comprehensive information on past and potential future climate. Independent Evaluation and Quality Control (EQC) is essential to allow users to use the data served via the CDS with confidence. There is an acute need for actionable information to support decision making in the face of a changing climate. At the same time, there is a bewildering array of products potentially available. Users need to be guided to make informed choices based on the knowledge of the suitability, quality and reliability of the CDS products for their applications. We present here the Quality Assessments service of observational and reanalysis-based Essential Climate Variable products available via the Copernicus Climate Change Service Climate Data Store. Such data and the procedure to assess their quality and applicability are of clear relevance to SPARC. Data to be evaluated includes the brand-new atmospheric and oceanic re-analyses ERA5 and ORA5, the satellite-based observations for a range of atmospheric ECVs, and products derived from in-situ gridded observations. Our Service (hereafter C3S_511) shall achieve the EQC functionalities by combining the use of an automated system based on the ESMValTool (extended and further developed to characterize observational products) and scientific expertise in order to deliver reliable quality assessments in an efficient and timely manner. The team includes top-level institutions involved in climate research and service provision (CSIC, CLU srl, DLR, ENEA, ETHZ, IO-PAN, LMU, NUIM, UCL, VUB) and personnel include IPCC Coordinating Lead Authors, members of GCOS panels, and WMO Commission for Climatology representatives collectively able to provide guidance on the technical and scientific issues over the wide range of themes and domains. Functionally, the EQC activity will consist of an independent scientific quality assessment service providing key information summarized in a consistent manner across ECV products through accessible Quality Briefs. These briefs shall be based on a consolidated set of quality functions addressing: (i) the functional maturity of data records and compliance to GCOS requirements via an independently performed assessment; (ii) a quantitative Fitness4Purpose assessment for specific use cases; and (iii) a summary of the resulting assessments based on an Application Performance Matrix to guide users. The use cases will focus on the applicability of CDS data single- and multi-product offerings based on a cross-comparison of available observations and reanalyses to a wide range of pre-selected problems that CDS users may wish to address. In this presentation, we will present the general objectives of the evaluation of observations, the structure of the EQC system and preliminary results. Constructive feedback on the plans is welcomed.

Key words: Evaluation and Quality Control, ECVs, Copernicus Climate Change Service