

Climate Data Records – History, Status, and Future

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The NOAA Climate Data Records (CDR) Program began in 2003 by engaging the National Academies to help define a CDR and develop guidelines for establishing an operational CDR program. First funding for the CDR program was received in 2007 and, in collaboration with the scientific community, more than 41 CDRs have now been transitioned to initial operating capability (IOC). The process for attaining IOC status will be outlined as well as a more recent example of transitioning the International Satellite Cloud Climatology Program (ISCCP) to full operating capability (FOC). A key in the progression from research to IOC and then FOC is an ongoing assessment of the qualities that ensure openness and transparency in CDR processing using a maturity matrix. Maturity assessment approaches to data storage and archival are increasingly being used across a range of disciplines including finance, medical records, and the geophysics.

Although the CDR Program was originally created for satellite data, a European program has adapted the CDR maturity assessment matrix approach and demonstrated that it is applicable also to in situ and climate re-analysis data. This expanded assessment approach is called the system maturity matrix and has been used to assess European capabilities for the Copernicus Climate Change Service. Maturity matrix approaches help objectively assess software engineering, metadata and preservation, and usage aspects of a CDR. However, they do not provide a metric of fitness for purpose of a given CDR. An application performance metric has been proposed to assess fitness for purpose and initial results of applying this metric will be presented.

Finally, application of the maturity matrix and application performance metric to global surface temperature records will be shown and discussed with an emphasis on the NOAA products. The use of metrics is applied and assessed using the Global Climate Observing System Essential Climate Variable (GCOS ECV) CDR requirements.