

## ICSU World Data System-Global Data for Global Science

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Perhaps the most compelling arguments for the long-term curation of scientific data sets is embodied in the current debate about the "anthropocene," and the extent to which human activity changes our planet. The time scales associated with such change are of course central to the discussion, and can only be ascertained if continuous time series of sufficient duration are collected and maintained. Consequently, scientific research relevant to that debate is increasingly data driven: from data assimilation to long-term time series and beyond. It is now well established that data have an intrinsic value that outlast current science foci.

Although new information and communication technologies encourage innovation and permit individual scientists and institutions to make data and information easily available, the web is constantly changing and somewhat chaotic. URLs disappear and previously available information can be lost without trace overnight. Data can be managed by individuals or groups in voluntary distributed systems on the internet but quality assurance and long-term accessibility issues are frequently neglected. For instance, reliable and systematic migration of data holdings to new storage technologies is often beyond the resources of all but the best supported data repositories. Thus, data sets collected only every few decades-for instance, data from the International Polar Year-are potentially at risk, unless concerted efforts are made to guarantee their long-term, sustainable curation.

A primary goal of the ICSU World Data System is to foster such efforts, and to support the long-term ICSU vision for a world in which science is used for the benefit of all, with universal and equitable access to high-quality scientific data. This, we argue, is closely linked both to scientific progress and technological advances, and calls for a fresh view of the concept of "publishing" carefully vetted data sets in trustworthy repositories with long-term sustainability prospects.

Keywords: Data management, Data stewardship, Data repositories, Data publication, Open access to scientific data

