The ICSU World Data System (WDS): An update on progress and current developments

Mustapha Mokrane, WDS International Programme Office, NICT (Japan),
Mustapha.mokrane@icsu-wds.org
Sandra Harrison, Chair WDS Scientific Committee, Centre for Past Climate Change at the University
of Reading (UK) / Macquarie University (Australia), sandy.*harrison*@mq.edu.au
Lesley Rickards, Permanent Service for Mean Sea Level, National Oceanography Centre (UK),
ljr@bodc.ac.uk

The World Data System (WDS) is an Interdisciplinary Body of the International Council for Science (ICSU) created by its 29th General Assembly in Maputo, Mozambique in 2008. ICSU-WDS builds on the 50+ year legacy of the World Data Centres and Federation of Astronomical and Geophysical data analysis Services established by ICSU to manage data generated by the International Geophysical Year (1957–1958). It became clear after the International Polar Year (2007–2008) that these bodies were not able to respond fully to modern data needs, and they were thus replaced by the ICSU World Data System in 2009.

This poster describes the development of the WDS since its inception, considering its mission, strategy, membership, working groups and developing partnerships - highlighting successes and considering future activities.

The mission of the World Data System is to support ICSU's vision by promoting long-term stewardship of, and universal and equitable access to, quality-assured scientific data and data services, products, and information across a range of disciplines in the natural and social sciences, and the humanities. ICSU-WDS aims to facilitate scientific research under the ICSU umbrella by coordinating and supporting trusted scientific data services for the provision, use, and preservation of relevant datasets, while strengthening their links with the research community.

The strategy for achieving these objectives is outlined in the current five-year Strategic Plan 2014–2018, structured round five major targets:
1. Make trusted data services an integral part of international collaborative scientific research
2. Nurture active disciplinary and multidisciplinary scientific data services communities
3. Improve the funding environment for trusted data services
4. Improve the trust in and quality of open Scientific Data Services
5. Position WDS as the premium global multidisciplinary network for quality-assessed scientific research data

WDS Members
Member Organizations of ICSU-WDS from wide-ranging fields are the building blocks of a worldwide 'community of excellence' for scientific data. Not only do these Members participate towards advancing WDS goals; their data holdings, services, and products are the cornerstone of the federated data system. As of February 2016, ICSU-WDS had 95 Member Organizations in four different categories. These are:

Type	No.	Definition
Regular	61	Organizations that are data stewards and/or data analysis services
Network	10	Umbrella bodies representing groups of data stewardship organizations and/or data analysis services, some of which may or may not be WDS Regular Members. Usually serve as coordinating agents for nodes that have common characteristics

		and mostly common disciplines.
Partner	6	Organizations that are not data stewards or data analysis services, but that contribute support or funding to ICSU-WDS and/or WDS Members
Associate	18	Organizations that are interested in the WDS endeavour and participating in our discussions, but that do not contribute direct funding or other material support

Member Organizations are formally accepted into ICSU-WDS by the WDS Scientific Committee, who safeguard the trustworthiness of ICSU-WDS by certifying Regular and Network Members according to internationally recognized standards. Partners and Associates are co-opted.

ICSU-WDS brings its Member Organizations together to coordinate their activities and through that process, to achieve an overall capability that transcends individual ones. Membership also increases exposure to potential users and collaborators internationally. It demonstrates that the Member Organizations have a strong and tangible commitment to open data sharing, data and service quality, and data preservation - all of which are increasingly considered prime requirements by science funders and are high on policymakers' agendas since they benefit the scientific community, economy, and society in general.

WDS Working Groups
1. Data Publishing
The WDS Working Group on Publishing Data was started in late 2012 with the aims of identifying and defining best practices for data publication, as well as testing its implementation by involving core stakeholders. The WDS concept addresses essential problems and practical issues such that publication of research data can become part of the scholarly record. Because the involved issues are interlinked, the following four WGs were established: Bibliometrics, Cost Recovery, Services and Workflows.

2. Certification
Data sharing enables reuse of data and ultimately makes science more transparent. To ensure the quality and usability of shared data and to provide long-term preservation and access, sustainable data services are key components of scientific infrastructure. However, it is vital to guarantee the trustworthiness of a service to perform these functions, and certification by an appropriate authority is fundamental in promoting confidence in shared data resources.

3. Knowledge Network
The Knowledge Network is a Web-based, interlinked repository of relationships between the actors and entities that make up our research landscape: people, institutions, projects, research disciplines and topics, funding sources, and the like. ICSU-WDS has a stated objective to establish an aggregation of WDS Members' metadata holdings so that the extent of data and services offered are discoverable through a single interface.

New Partnerships Established
The Research Data Alliance, ICSU's Committee on Data for Science and Technology (CODATA) and the World Data System have signed Memoranda of Understanding outlining their collaboration. The three organizations have different but complementary foci and strengths, and the MoUs clarify their respective strengths and enable the new Partnership to accomplish more; to advance data practices and science faster and further, and thus increase the benefit of research data for society.