ICSU World Data System

Global Data for Global Science

The WDS Concept

The World Data System (WDS) builds on the 50+ year legacy of the World Data Centres and Federation of Astronomical and Geophysical data analysis Services established by the International Council of Science (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 to modern data needs and were thus disbanded by the ICSU General Assembly in 2009.

Under the auspices of ICSU, the constitution of the newly established WDS supports ICSU's mission of 'strengthening international science for the benefit of society' by ensuring universal and equitable access to, and long-term stewardship of, **quality-assured scientific data and data services, products, and information** covering a broad range of natural and social sciences. Through such provision and integration of multidisciplinary data, WDS will facilitate researchers across scientific domains to answer the grand challenges for global sustainability.

To fulfil its remit, ICSU-WDS is striving to build a worldwide 'community of excellence' for scientific data by certifying member organizations—holders and providers of data or data products—from wide-ranging fields using internationally recognized standards. These WDS Members are then the building blocks of a searchable common infrastructure with which to form a data system that is both interoperable and distributed.

WDS Implementation

Governance

WDS is governed by a Scientific Committee (SC) made up of prominent scientists actively involved in dealing with large dataset issues and long-term data stewardship. Appointed by the ICSU Executive Board, the SC includes directors of WDS member organizations and covers a broad range of disciplines and geographical areas. Its role is to develop and prioritize plans for WDS—including initiating projects and activities and guiding their implementation—establish working groups when necessary, and communicate and publicize the outcomes.

The WDS-SC is supported by an International Programme Office (IPO), which is hosted and financially supported by the Japanese National Institute for Information and Communication Technologies until 31 March 2016. Operating under its Executive Director with direct supervision and guidance from the SC Chair, the IPO is responsible for daily implementation of WDS-SC decisions, WDS activities, and WDS communication functions.

Data Policy

To contribute to international data-sharing efforts, ICSU-WDS has adopted the principles of GEOSS. Data, metadata, and products shared within WDS will be

- Exchanged fully and openly, recognizing relevant international instruments and national policies and legislation.
- Made available with minimum time delay and at minimum cost.
- Free of charge or at reproduction cost for research and education.

Members

Member organizations join voluntarily and primarily participate in ICSU-WDS by contributing their data holdings and data services and products. They also provide essential contributions to WDS working groups in which they have an interest, and they are fostered by the WDS-SC and IPO to actively participate in common projects and activities that advance WDS aims.

Four membership categories have been developed to address differences in the granularity and nature of applying organizations—Regular, Network, Partner, and Associate. These categories can be grouped into two types:

- Regular and Network Members, who hold, serve, or produce data; and include virtual data centres. These Members undergo a review for certification and are required to sign a Letter of Agreement with ICSU.
- Partner and Associate Members, who provide various backing to WDS or are simply interested in the endeavour. This group are currently co-opted and no agreement is signed yet with ICSU.

Realizing the WDS Vision

At the end of October 2012, over 50 Members had joined WDS. With this strong foundation in place, the inaugural meeting of the second WDS-SC held on 1–2 November 2012 was tasked with developing the framework that will position ICSU-WDS as the ***premium global multidisciplinary network for quality-assessed scientific data*** and enable WDS to significantly contribute to projects such as *Future Earth,* ICSU's flagship programme.

Action Plan

The following priority areas have been recognized by WDS as imperative to accomplishing its goals.

Community building: WDS will encourage Regular Members in similar fields to collaborate and create networks where these do not exist. In particular, WDS will be an international coordination forum for data centres and services to document common practices and standards. To increase disciplinary and global coverage, WDS will moreover concentrate on recruiting Network Members. The comprehensive accreditation procedure prescribed by WDS is unique in the data management landscape, and will be used to align WDS and partner networks.

Establishing relevant tools: WDS will exclusively provide three essential leading-edge services.

1. A community-based **Data Publication and Curation Service**. Adoption of data publication and citation frameworks will be promoted for WDS Members. This will require collaboration with organizations such as the International Council for Scientific and Technical Information (ICSTI) and DataCite.
2. A **WDS Open Metadata Catalogue**. WDS Members' published metadata will be aggregated and their datasets made discoverable and accessible.
3. A searchable **WDS Scalable Knowledge Network**. An enriched data and information catalogue for use by scientific projects, funders, and other stakeholders that will be the primary source of information on global capability with respect to scientific data centres and service providers.

Strengthening links with partners: The Committee on Data for Science and Technology (CODATA)—a sister organization of WDS beneath the ICSU umbrella—is concerned with generating data policy, standards, and methods. In this regard, it is complementary to WDS, which applies such devices in practical settings. CODATA has a long history of hosting international conferences that are strongly attended by core data scientists. With overlapping audiences, WDS and CODATA will co-locate future conferences to reinforce their ties and create the world's principal data science event. Moreover, WDS will work with other organizations sharing a similar ethos (e.g., the Research Data Alliance) to ensure that a common unified message on data stewardship is disseminated and put into practise.

ICSU World Data System activities

International Programme Office

Mustapha Mokrane

WDS Highlights in 2012

- WDS-IPO Ministerial Inauguration
- New Scientific Committee:
    - Asia/Pacific: 2 Japanese, 1 Chinese, 2 Australians
    - Vice-chairs: F. Genova and M. Diepenbroek
- Expanding Membership:
    - 48 Regular, 4 Network, 2 Partner, 8 Associate
- WDS as GEO Participating Organization
- Collaboration with CODATA:
    - Planet Under Pressure, Rio+20, Future Earth
    - Joint or co-located conference in 2014

Priority Areas

A. Community building

Coordination forum for data centres and services to document common practices and standards.

- Work with Network Members: IVOA, IODE, IGS, ESDIS.
- Recruit new Network Members: IUGONET, ISES…
- Foster new networks (thematic, national, regional)
- Increase disciplinary coverage (Social, health…)

Priority Areas

B. Data Publication and Curation Service
Adoption of data publication and citation frameworks for WDS Members.

- Working Group Charter (Chair: M. Diepenbroek)
- Open to WDS Members
- Links with Science Publishers: Willey, Elsevier
- Links with existing groups (CODATA/ICSTI Data Citation, DataCite, SCOR/IODE, PREPAREDE)

Priority Areas

C. Open Metadata Catalogue
Aggregated and published metadata, discoverable and accessible datasets of WDS Members.

D. Scalable Knowledge Network
Rich catalogue on global capability with respect to scientific data centres and service providers.

- Working Group Charter (Chairs: K. Finney and W. Hugo)
- Open to WDS Members

Collaborations

- CODATA:
    - Joint or co-located conference in 2014
    - Possible theme: *'A Science-Driven Global Framework for Multidisciplinary Data Integration'*
    - Joint events leading to the Conference

- GEO/GEOSS
    - Contribution to GEOSS: WDS Open Metadata Catalogue

- Research Data Alliance (RDA)
    - Launch event March 2013
    - Possible joint Working Groups

- SCAR/SCADM
    - Joint forum on Polar Data Management: **Tokyo, Sept 2013**

Governance

- Bylaws for ICSU-WDS
  Participation of Members in WDS and the mechanisms for interaction with the WDS-SC
  - To be developed in 2013
  - Involve Members

- New Website
  - Managed by the IPO
  - Foster collaboration between Members

Capacity Building

- Grant for a second WDS node in South Africa
    - WDC Biodiversity and Human Health
    - Network Data Centre for Socio-Economic Data