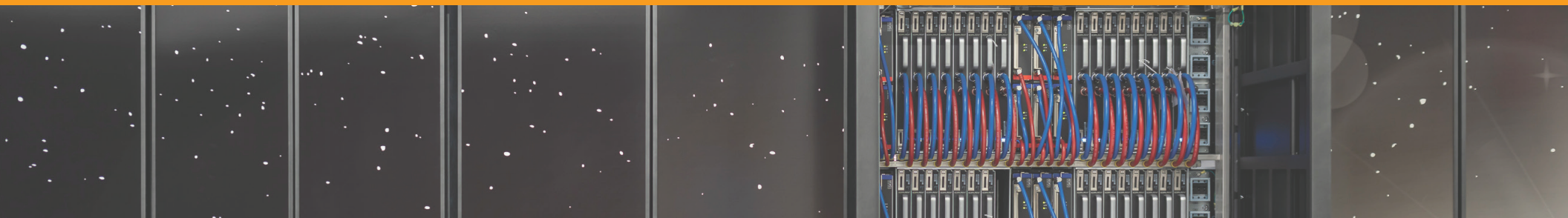




World Data System



Frontier Supercomputer *Courtesy of Oak Ridge National Lab*

Action Plan 2022-24

Message from the Scientific Committee Chair

The World Data System (WDS) made big changes in 2021 after decades of support from the previous hosts in Japan. In addition to the International Program Office (IPO) moving to the United States, the Scientific Committee was refreshed with six new individuals, and a new Executive Committee was formed. Out of this came the need for a new vision which led to strategic planning and a review and updating of the organization's constitution and bylaws, which members approved in 2022.

All these administrative actions culminated in creating the following action plan, a guidance document to focus the WDS on its path forward over the next two years.

As the Chair of the WDS-SC, I am honored to work with my colleagues, members, and our sponsors toward a great impact on and for data repositories in all disciplines and in all countries. As an affiliated body of the International Science Council (ISC), we want to continue their vision of science as a global public good. The rapid changes in open data and open science give the WDS opportunity to be of great support to our members and we look forward to navigating these changes together.

Further together,

David Castle

Chair of the World Data System
Scientific Committee



The **mission of the World Data System** is to enhance the capabilities, impact, and sustainability of our member data repositories and data services by:



Creating trusted communities of scientific data repositories



Strengthening the scientific enterprise throughout the entire lifecycle of data and all related components creating first-class data that feeds first-class research output



Advocating for accessible data and transparent and reproducible science

Scientific Committee

David Castle, Chair (Canada) Science, Technology, and Innovation Policy

Hugh Shanahan, Vice Chair (UK) High Energy Physics

Claudia Maria Bauzer Medeiros, Vice Chair (Brazil) Computer Science

Christine Choirat (Switzerland) Health Data Science

Mamoru Ishii (Japan) Space Weather

Margaret Levenstein (USA) Political and Social Research

Libby Liggins (New Zealand)

Yasuhiro Murayama (Japan) Space Physics

Marc Nyssen (Belgium) Electronics and Medical Informatics

Ioana Popescu (Netherlands) Hydroinformatics

Juanle Wang (China) GIS



Governance

The Scientific Committee (SC) is the governing body of the World Data System. It is made up of leading scientists and experts who are actively involved with data. The Committee includes directors of WDS member organizations and covers a broad range of disciplines and geographical areas.

ACTION PLAN

This Action Plan focuses on making progress on **four objectives in the next two years:**

1

Provide services and support to existing and new members

2

Develop value narratives for WDS members

3

Provide global leadership and agenda setting

4

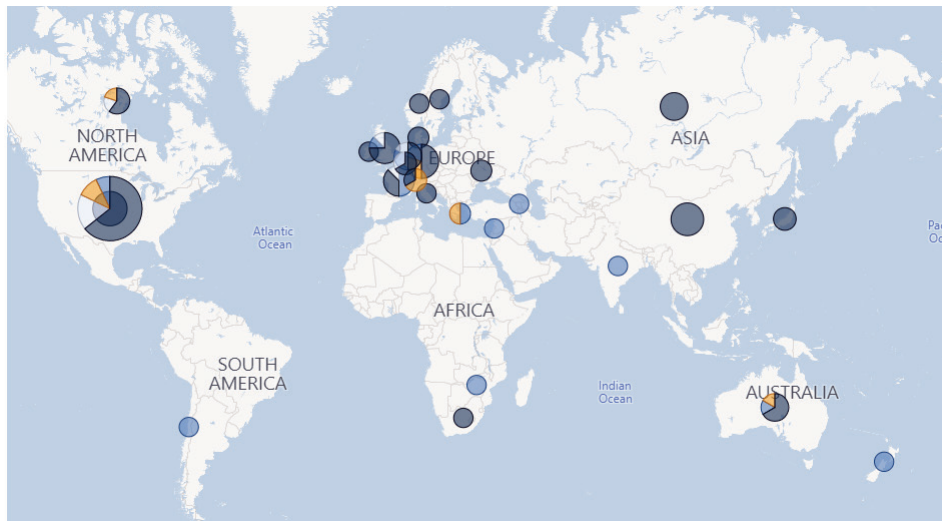
Enhance access, quality, and accessibility of data worldwide

1

Provide services and support to existing and new members

The WDS exists to develop and support an international community of members responsible for scientific data repositories and related data stewardship. Current membership of the WDS is predominantly in the global north. Increasing representation in the global south has been identified as a priority. The WDS will work with partners in the global south to identify existing repositories who may wish to become members and assist with efforts to develop new repositories that may become WDS members.

WDS membership currently reflects historically data-intensive fields, especially earth and environmental science, astronomy and space science. Many other fields, notably those in the social sciences and humanities, are increasingly data intensive. In addition, AI/ML is being used to explore societal issues that can only be informed by trustworthy and accessible social science and humanities data. WDS sees the need to identify more repositories that have these holdings and to make them aware of the full suite of WDS services. The WDS will undertake to diversify its membership more broadly across disciplines. The WDS will undertake, through regular and wide consultation and by receiving recommendations, to increase its membership and diversify members across disciplines.



Membership by geographic location & type

● Associate

● Partner

● Network

● Regular

1

Provide services and support to existing and new members

The objective to provide services and support to existing and new members will be implemented through the following actions:

Renew existing members and continue to serve their interests and needs

Enhance communication with members to encourage greater participation and better understand their needs

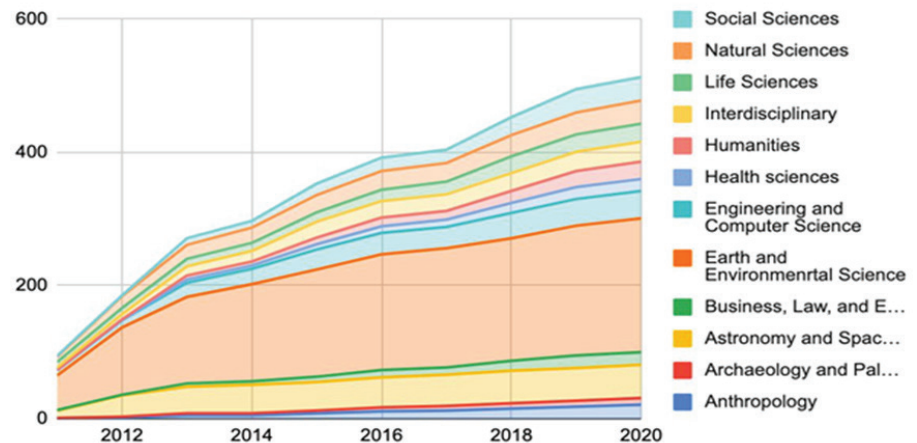
Increase the number of WDS members generally, with focus on

Addressing membership gaps in the global south

Addressing membership gaps in under-represented, data-intensive fields

Continue to develop federated infrastructure and coordinate activities amongst data managers.

Disciplinary Focus of Members



Disciplines represented by WDS Regular Members. Total exceeds number of members because many members serve multiple disciplines. *Graphic created by Wim Hugo*

The World Data System is an interdisciplinary body of the **International Science Council**.



**International
Science Council**

2

Develop value narratives for WDS members

Repositories have served the data needs of scientific communities for decades and are a critical element of global scientific infrastructure. As scientific disciplines and practices evolve, the needs of user communities change with different approaches to the creation, sharing and utilization of data also evolve. The open science movement also reshapes expectations regarding access to data, appropriate limitations on open-by-default, and raises the question about data ownership and benefit sharing. These expectations also include the idea that the data will always be available when in fact funding or other societal disruptions can impact the sustainability of a repository. Publishers increasingly assert an interest in data and data quality associated with publications and demonstrate a growing interest in this part of the research lifecycle. Their involvement may alleviate some sustainability issues but the cost of open science is still an important question. Passing responsibility of data to publishers raises concerns, in particular responsiveness to the relevant research communities.

In this context, repositories, an essential element of the scientific enterprise, must demonstrate continued relevance to the research communities they serve. They must also demonstrate value to funders, a challenging proposition when the ubiquity of data and the seamlessness of well-managed technology leaves the impression that repository costs should decline, when in fact, these elements have substantial costs attached to them. The WDS, in response to members' concerns about funding and sustainability, will work with each member to develop resources to demonstrate relevance and value to research communities and funders. This objective will be supported by three actions.

Creating a framework for repositories in which:

- 1 WDS is clearly positioned as the **voice for data repositories globally, and clearly expresses the value proposition for each WDS member repository**
- 2 Partnering with each repository to **develop value narratives for the purposes of communications, funding, and sustainability**
- 3 **Awarding a data prize that rewards innovative use, analysis and visualization of data** found within WDS member repositories which demonstrates tangible value.

Ethan Welty 2020 WDS Data Stewardship Award Recipient



Ethan Welty is a glaciologist specializing in the analysis of glacier time-lapse photographs. He also works as a scientific data and software consultant for organizations such as the Cascadia Field Station of the United States Geological Survey, Catalyst Cooperative, and the World Glacier Monitoring Service (WGMS, WDS Regular Member).

3

Provide global leadership and agenda setting

The WDS is positioned to provide global leadership and contribute to setting the international agenda for data-intensive science. Through collaboration with other international organizations, working with WDS members, and engaging research communities, the WDS will lead in priority setting and supporting the global data community in its development of workforce capacity and skills development. These efforts will meet the evolving needs in the research data community while building partnerships and expanding the WDS network. The WDS will work towards this goal by:

Our funders and partners include:

International Science Council

University of Tennessee

US Department of Energy Office of Science

University of Tennessee Oak Ridge Innovation Institute

Digital Research Alliance of Canada

Ocean Networks Canada

University of Victoria

- 1 WDS members, ITO, IPO and SC **servicing in leadership positions** in relevant organizations that are setting priorities, developing standards, and creating roadmaps
- 2 WDS and CODATA can **collaborate on shared objectives** and initiatives, and as affiliated bodies of the ISC, can jointly support the ISC's mission and action plans
- 3 Enhancing workforce capacity and skills development through **education and training** opportunities that meet the scientific and technical needs of repositories and more broadly in response to research communities
- 4 **Supporting Early Career Researchers** (ECR) through the WDS Data Stewardship Award and the ECR Network
- 5 **Promoting open science** and encouraging adherence to the WDS **Data Sharing Principles** as seen in the WDS Bylaws to current and potential users, the media, and the public.
- 6 Offering **member training and guidance** on becoming a trustworthy repository and adopting new technologies



International
Science Council



4

Enhance access, quality, and accessibility of data worldwide

Data availability and quality is foundational to the success of the global scientific effort. The WDS exists to promote the availability and use of data worldwide, and increasingly there is an associated need to maintain trust in the data that is provided by WDS members. The WDS can develop an integrated standard for trust in data that incorporates the four dimensions of trust:

- 1 assurance of the ethical and legal provenance of data sources,
- 2 stewardship and certification that ensures data quality,
- 3 adoption of recognized research security practices to protect data,
- 4 integration of WDS data as part of the larger global research infrastructure.

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IS THANKFUL FOR OUR
SPONSORS AND
PARTNERS**

This approach combines elements of CARE, FAIR, and TRUST principles, but goes further in two other respects. The first is to expand the concept of data integrity to include the UNESCO Recommendation on Open Science, evolving requirements of the Core Trust Seal certification, and leading data security practices. Second, the WDS can work with existing and new members to make these data integrity factors repository-centric, that is, to interpret them in a guidance document of direct relevance to repository managers and data stewards. Questions surrounding provenance, integrity, and appropriate use of data can be addressed both through technical and community building activities. The WDS will address this objective by:

- 1 Developing a work plan to identify key issues around trust in data.
- 2 Creating a framework to address and respond to issues of repository and data security.
- 3 Developing a repository-centric approach to trustworthiness for inclusion in each member's value proposition.
- 4 Developing a roadmap for a global research commons, in conjunction with partners within and outside of WDS.

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World Data System International Program Office (WDS-IPO)

is hosted by the University of Tennessee Oak Ridge Innovation Institute. This work is supported by a cooperative agreement (DE-SC0021915) with the U.S. Department of Energy Office of Science. Contact WDS-IPO at wds-ipo@utk.edu.

World Data System International Technology Office (WDS-ITO)

is hosted by the University of Victoria. This work is supported by the Digital Research Alliance of Canada and Ocean Networks Canada. Contact WDS-ITO at ito-webadmin@oceannetworks.ca.