« One Water Vision » declaration

Agreement on scientific cooperation for water management through satellite earth observations

Water security is a major challenge around the world. Both water scarcity and drought as well as water excess and floods, due to the deregulation of the water cycle, are huge concerns for people and economies, and will likely get more and more severe in the next decades. On top, water quality is becoming a growing concern for agriculture, health and ecosystems.

In a context of recurring water crises and accelerated climate change, all stakeholders need to have access to better data and information to take informed decisions and manage risks and adapt uses. This requires enhanced international cooperation, combining earth observation and ground-truthing, water sciences, data management in through dedicated infrastructures, dialogue with stakeholders and capacity building to support countries in their efforts to improve water management and to provide effective solution to the global water crisis.

To accelerate the collection and delivery of water data, the **World Meteorological Organization** (WMO), the **International Network for Basin Organizations** (INBO) and a consortium of international scientific institutions, **the International Research Consortium** (IRC), are agreeing today to cooperate in the framework of the "One Water Vision" initiative.

The "One Water Vision" is a science-based initiative launched during the "One Water Summit", the heads of State and government summit organized by France, Kazakhstan, and the World Bank, hosted by Saudi Arabia in the margin of COP16 UNCCD. It aims at developing and scaling-up solutions to address the global water crisis and to achieve notably Sustainable Development Goal 6 (SGD 6) targets on clean water and sanitation, and its interconnexions' with the other SDG's.

The cooperation agreement will help to co-design **novel methods of water monitoring and management, and further develop early warning systems for droughts and floods**. The "One Water Vision" will contribute to capacity building and training for data and information users. It will combine latest **earth observations** and **ground-truthing** over a range of sites, including using advanced modelling and artificial intelligence in order to deliver services to a variety of users, from water management authorities to farmers

and other land managers and stakeholders, thereby contributing to reduce the burden of the water crisis. This initiative will accelerate the delivery of products and services for the countries and organizations involved in the One Water Summit process and beyond.

The members of the One Water Vision initiative commit to work together on three pillars of action:

1. **Reinforce operational services through scientific and technical cooperation programs, also involving the private sector.**
    - The Space for Climate Observatory (SCO), which brings together space agencies, international organizations, scientific institutes and private entities, will provide services derived from earth observations concerning the near real time monitoring of water stocks in dams, and of water quality in lakes and in large rivers, also including early warning systems for flood risks already in use in some countries, in the context of climate change.
    - Under the guidance of the WMO, international cooperation will be enhanced to provide free access to trusted data and information. Services will support to near real time monitoring and sharing of hydrological parameters, transboundary water flows and contribute to flood forecasting and sub-seasonal and season predictions. The WMO HydroHub, along with the WHYCOS program, will support the integration of innovative approaches of water monitoring. The Global Hydrological Status and Outlook System (HydroSOS), a vehicle to generate and share standardized, consistent data sets to characterize the hydrological system, will strengthen country's capacity across the hydrological value chain, by helping to produce standardized information on the current state of the water resources and outlooks for the next days or months. The WMO Hydrological Observing System WHOS will help making existing data from any existing source available and usable. Those activities are a backbone supporting the global **Early Warnings for All initiative** for hydrological disasters and, therefore, supports local resilience and preparedness.
    - Thanks to its basin approach and the launch of a "Task force on earth observation techniques and new data integration/processing technologies supporting water resources management" by INBO/WMO during the World Water Forum 10 in May 2024, INBO will promote and share knowledge on products, services, procedures and tools, and will gather user requirements and contribute to reinforce capacities of final users. The support of pilot projects will reinforce the basin, national and regional approach of the "One Water Vision". WMO overall activities

related to satellite will be leveraged. The SCO will also be connected to this task force.

2. **Trusted data sets will be co-developed with users by ground-truthing earth observation data sets in pilot sites across world regions.** Calibrating and validating earth observation data from recently launched satellites, such as the Surface Water and Ocean Topography (SWOT) satellite, will be essential to accelerate the delivery of new services to users and this requires enhanced international cooperation.

   The SWOT satellite, developed by NASA and CNES, is the first to deliver hydrological data at high spatial and temporal resolution, and will allow to monitor surface water stocks in lakes and flows in streams, as well as in glaciers.

3. **The development of novel approaches through enhanced scientific and technical cooperation.**

   For the first time, agricultural droughts will be monitored by the TRISHNA satellite to be launched in 2026 through a cooperation between ISRO (Indian space agency) and CNES. It will have a 50 meters spatial resolution and will monitor droughts 3 to 4 times per week using thermal infrared observations of the vegetation cover. Calibration and validation of such data has already begun at test sites. Co-design with farmers and land owners will provide breakthroughs allowing to better manage with irrigation water and to adapt crop management to drought risks, thereby contributing to food and nutrition security. Such services need to be tailored to the needs of several users, especially from drought prone regions that are often subjected to land degradation and desertification.

   The SWOT and TRISHNA missions are both precursors to future operational missions within the Copernicus framework. These pre-positioning guarantees both operational capacity (essential for applications and services) and access to long time series (essential for science in the current context of climate change, and also for applications).

The "One Water Vision", thanks to the complementarity and resources of all actors involved, will encompass international, regional and national scales, as well as the transboundary aspects.

Riyadh, 3rd of December, 2024

The "One Water Vision" has been endorsed by:

World Meteorological Organization (WMO)

International Network of Basin Organization (INBO)

One Water Vision International Research Consortium (IRC)

Al-Farabi Kazakh National University (KazNU), Kazakhstan

Atmospheric Environmental Remote Sensing Society (AERSS), Chinese Academy of Sciences (CAS), China

Bureau de Recherches Géologiques et Minières (BRGM), France

Centre de coopération internationale en recherche agronomique pour le développement (Cirad), France

Centre National d'Etudes Spatiales (CNES), France

Centre National de la Recherche Scientifique (CNRS), France

Centre de Recherche en Ressources en Eau du Bassin du Congo (CRREBaC)

Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia

Consultative Group on International Agricultural Research (CGIAR), International Organization

Indian Institute of Sciences (IISc), India

Information and Analytical Center for Water Resources (IACWR), Kazakhstan

Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement (INRAE), France

Institut de Recherche pour le Développement (IRD), France

International Centre for Integrated Mountain Development (ICIMOD), Intergovernmental Institution

International Water Management Institute (IWMI), International Organization

International Water Research Institute (IWRI), Université Mohammed VI Polytechnique (UM6P), Morocco

National Agriculture and Food Research Organization (NARO), Japan

National Institute of Agriculture Research (INRA), Morocco

Servico Geologico do Brasil (SGB), Brazil

The Space for Climate Observatory (SCO), International Initiative

UK Centre for Ecology & Hydrology (UKCEH), United Kingdom

Wageningen University & Research (WUR), Netherland

The « One Water Vision » declaration, Cooperation agreement on scientific cooperation for water management through satellite earth observations is not legally binding.