Catalyzing Innovation in Weather Science: the World Weather Research Programme

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WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

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World Meteorological Organization
Organisation météorologique mondiale

20 Years of WWRP

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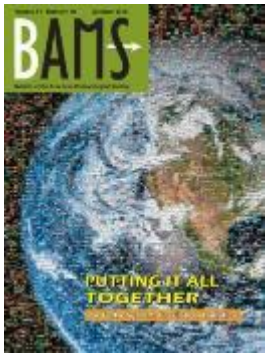
Seamless Prediction

Originally defined at the intersection of weather and climate



Seamless prediction in the WWRP context considers all compartments of the Earth system as well as disciplines of the weather enterprise value chain (monitoring and observation, models, forecasting, dissemination and communication, perception and interpretation, decision-making, end-user products) to deliver tailor made weather information from minutes to months and from global to local.

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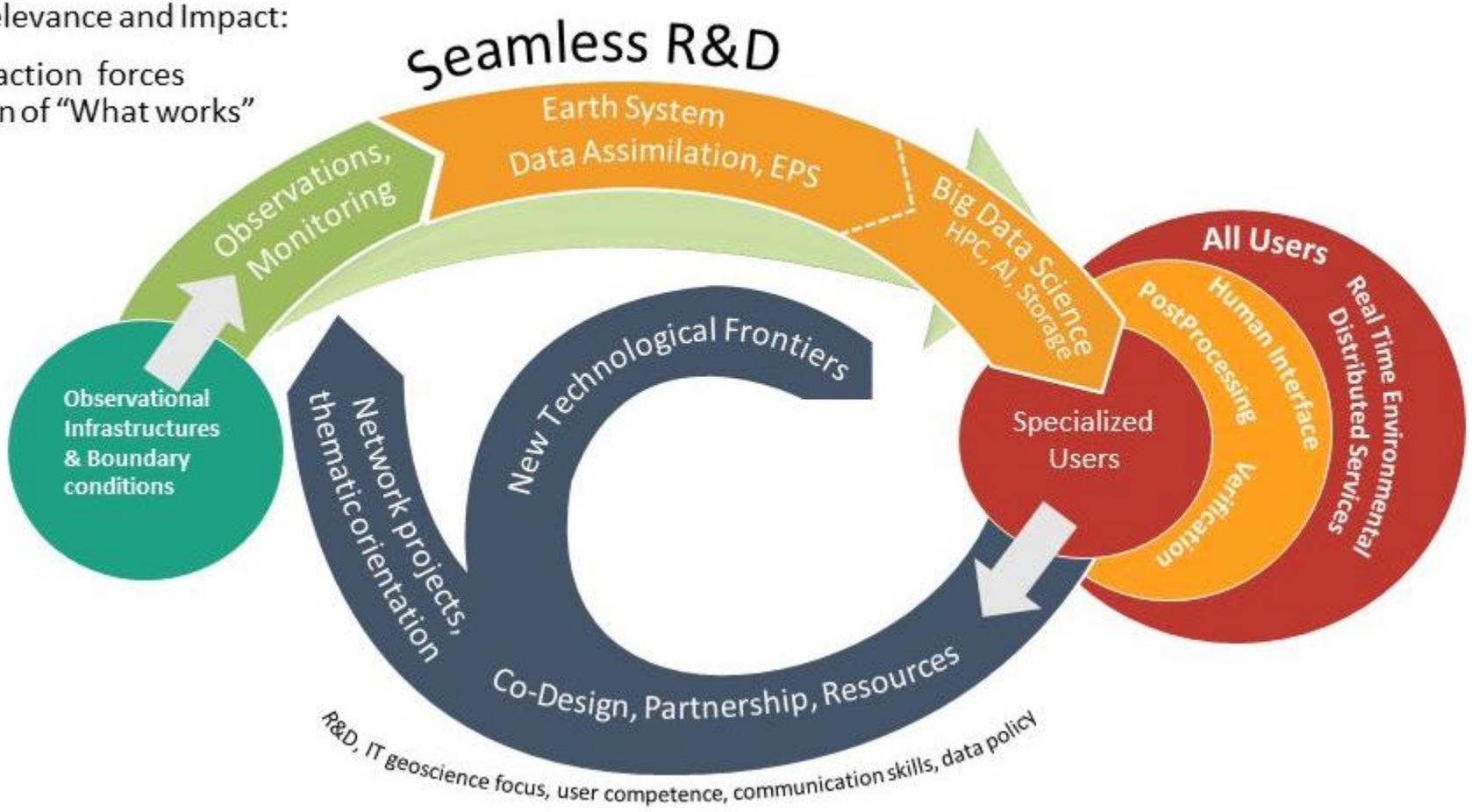
WWRP WORLD WEATHER RESEARCH PROGRAMME

Science for Services – a value cycle approach bringing research and operations together

Quality, Relevance and Impact:

User Interaction forces exploration of "What works"



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The World Weather Research Programme

WMO's mechanism to foster and progress cooperative research for improved weather and environmental prediction services from minutes to months

Mission

"The WMO World Weather Research Programme (WWRP) promotes international and interdisciplinary **research for more accurate and reliable forecasts from minutes to seasons**, expanding the frontiers of weather science **to enhance society's resilience** to high-impact weather and the **value of weather information for users**. WWRP aims at Seamless Prediction by increasing convergence between weather, climate and environmental approaches. WWRP **strengthens academic – operational partnerships** and interdisciplinary collaborations, and enhances **the role of Early Career Scientists**

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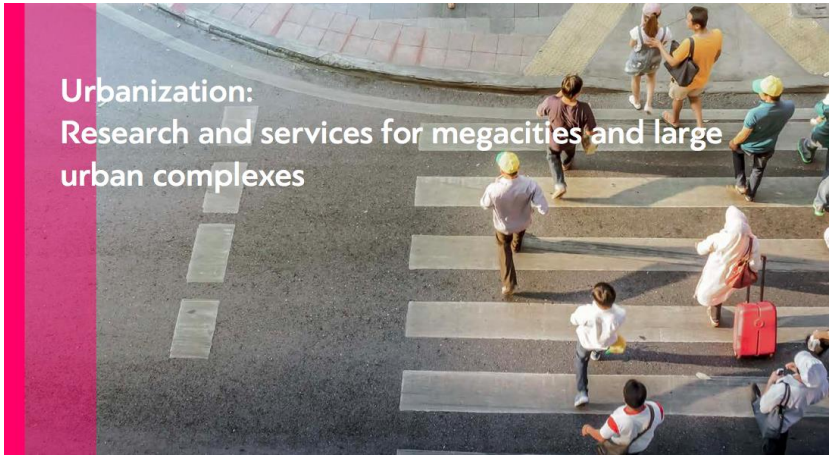
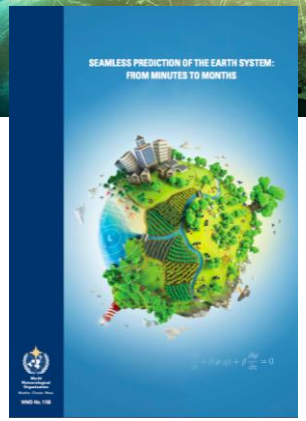
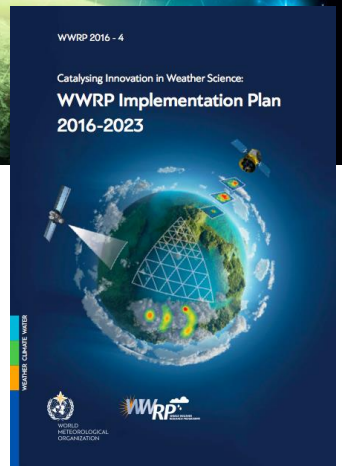
WWRP WORLD WEATHER RESEARCH PROGRAMME

WWRP activities focus on four challenges



A guide to catalyze innovation





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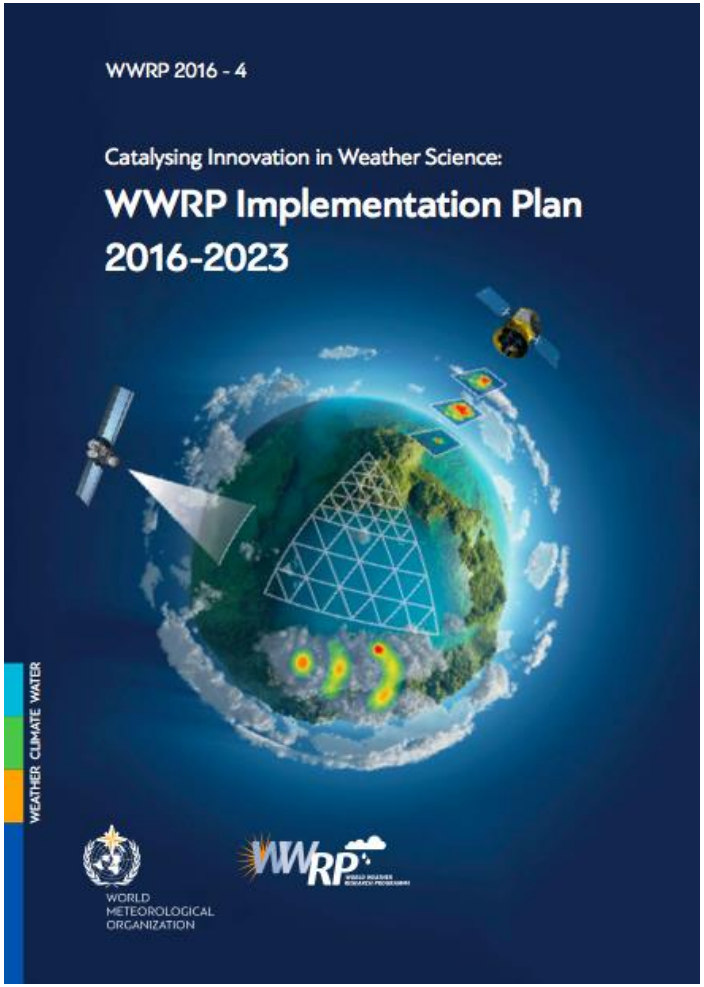
WWRP Implementation Plan



For each societal challenge the Implementation Plan:

- **Identifies the key scientific and implementation challenges**
- **Specifies the key needs for international coordination**
- **Articulates the resulting benefits for members**
- **Defines Action Areas**

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WWRP Structure

Scientific Oversight & Management

Scientific Steering Committee

World Weather Research Division at WMO Secretariat

WWRP Working Groups

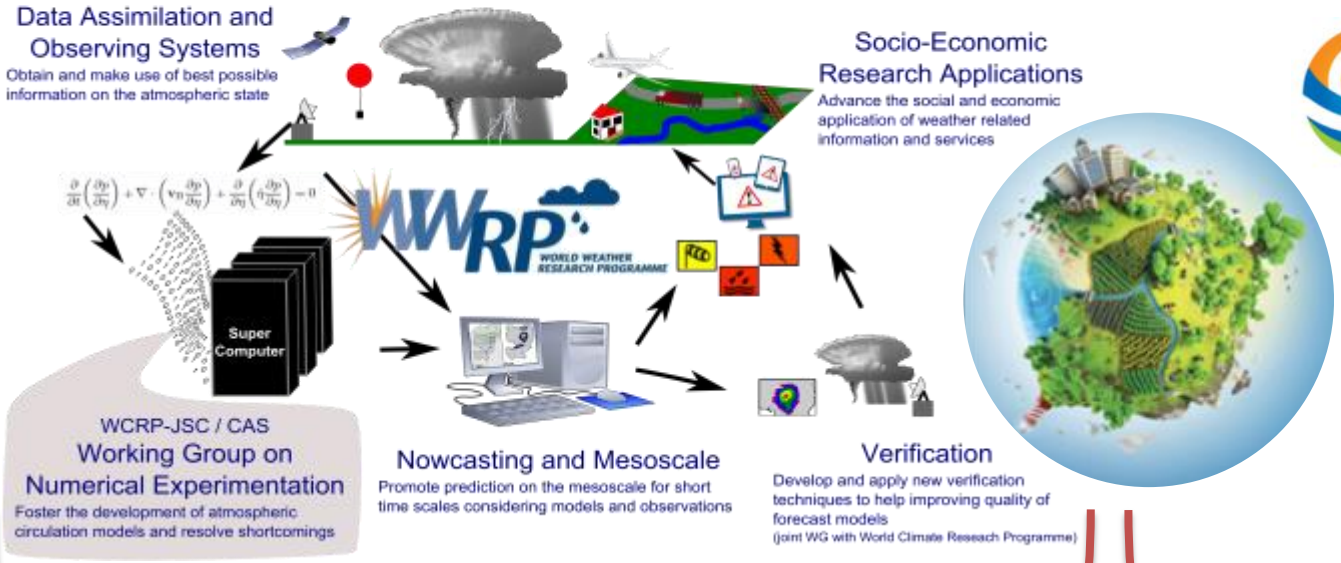
Tropical Meteorology
Identify and support research initiatives on tropical cyclones and monsoons

Predictability, Dynamics and Ensemble Forecasting
Advance the science of dynamical meteorology, predictability ensemble forecasting, promoting the development of ensemble applications

Weather Modification
Promote scientific practices in weather modification

Data Assimilation and Observing Systems
Obtain and make use of best possible information on the atmospheric state

Socio-Economic Research Applications
Advance the social and economic application of weather related information and services



WCRP-JSC / CAS Working Group on Numerical Experimentation
Foster the development of atmospheric circulation models and resolve shortcomings

Nowcasting and Mesoscale
Promote prediction on the mesoscale for short time scales considering models and observations

Verification
Develop and apply new verification techniques to help improving quality of forecast models
(joint WG with World Climate Research Programme)

WWRP Core Projects

Polar Prediction

Subseasonal-to-Seasonal S2S Prediction Project

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WWRP WORLD WEATHER RESEARCH PROGRAMME

Partnership with WCRP

Joint responsibility for:

- **Further development of subseasonal – to – seasonal prediction**
- **Enhancing resilience to weather-related risk in the context of a changing climate**
- **Developing the models used for weather and climate research, prediction and projection**
- **Contributing to development of observing system for weather & climate research and applications**
- **Developing future infrastructure for extreme computing and data handling**
- **Strengthening regional research and innovation**
- **Nurturing early career scientists**

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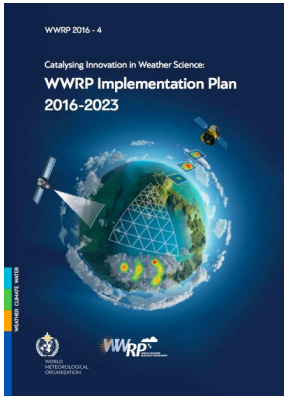

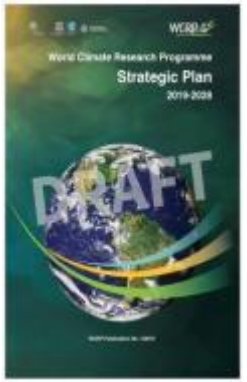

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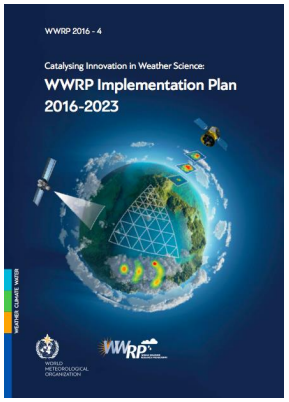
Partnership with WCRP

Potential for mutual benefit from collaboration related to:

- **Process understanding across time-and-space scales; translation to predictive skill**
- **Coupled data assimilation and reanalysis**
- **Organised tropical convection**
- **Vulnerability, risk, communication**
- **Comprehensive intensive field programmes to enhance process understanding and support model development in critical processes**
- **…….**



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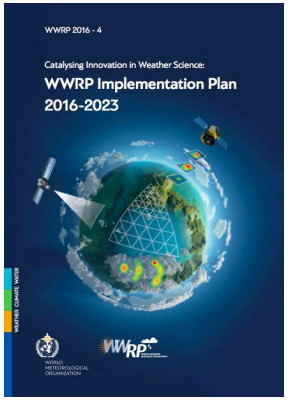
Partnership with WCRP

With the aim of:

- **Sharing knowledge and expertise**
- **Avoiding duplication of effort**
- **Using resources wisely**
- **Bringing scientific advances to regions where people are most vulnerable**



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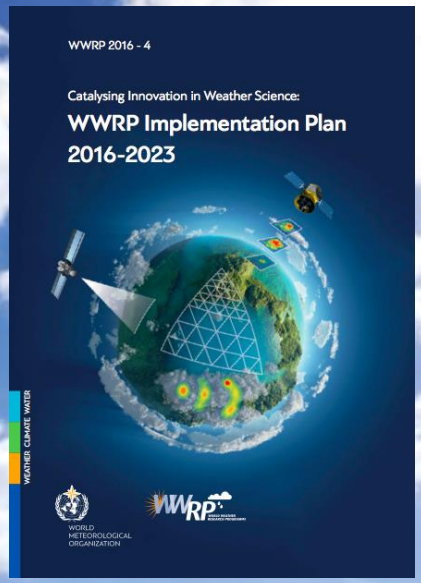
Thank you

Merci



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WWRP Action Areas

Societal Challenges

HIGH IMPACT WEATHER	WATER	URBANIZATION	NEW TECHNOLOGIES

Action Areas

Address Limitations Uncertainty Fully Coupled Applications Verification Attribution	Integrated Water Cycle New Observations Precipitation Processes Hydrological Uncertainty	Understand Needs Observations & Processes Urban Prediction	Advanced Methods Support Facilities Tools New Observations Future GOS

Objectives and Concrete Activities

Each Action Area comes along with a set of objectives.
Concrete Activities have been defined that will ensure to achieve the objectives and make progress in the action areas.