

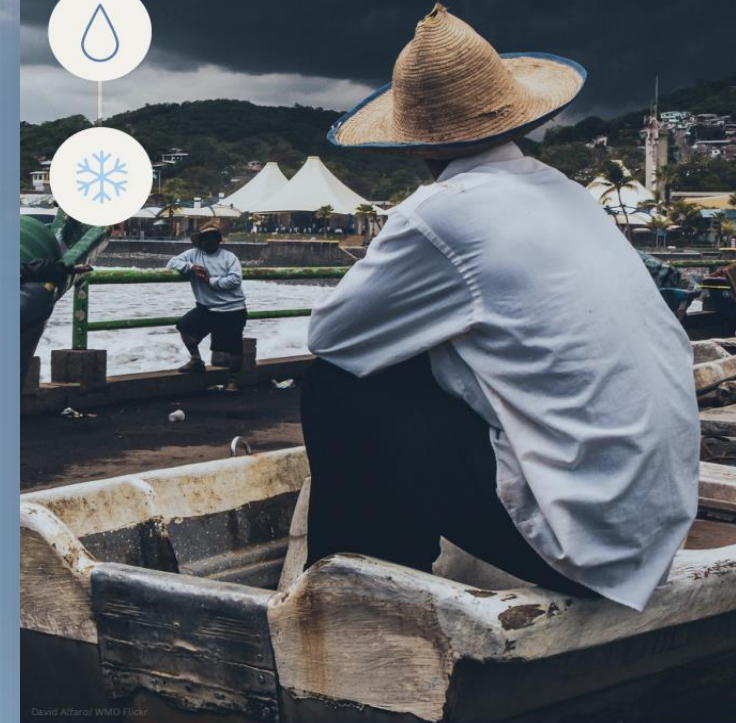


WORLD
METEOROLOGICAL
ORGANIZATION



The World Weather Research Programme: Activities and Plans Relevant to AR Recon

Chris Davis, Chair of the Scientific Steering Committee
Estelle de Coning, Head of WWRP



David Alfaro WMO Flickr



1998 - 2023

Weather Science for:

Boosting the Economy

Securing Sustainability

Protecting life & property

WWRP: 2016-2023

High-Impact Weather

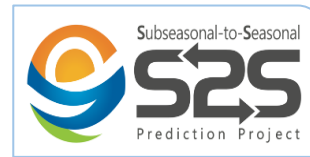
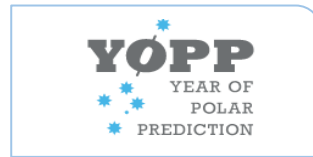
Water

Urbanization

New Technologies



Core Projects



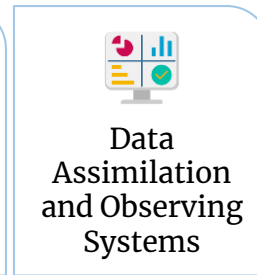
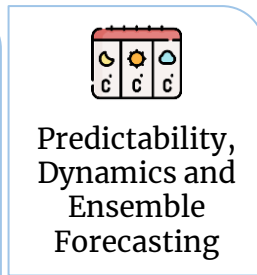
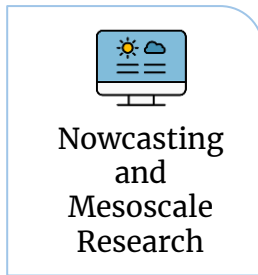
Sciences for Service Projects



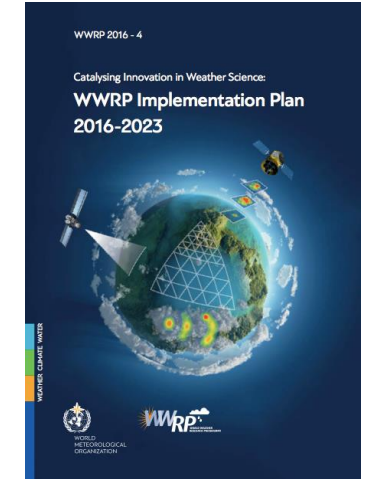
RDP = Research and Development Project



Working Groups



Endorsed and Partner Projects



S2S Core Project

S2S News Events/Meetings Newsletters Webinar

WWRP/WCRP S2S summit: Advancing Sub-seasonal to Seasonal Prediction and Applications(3-7 July 2023)

We would like to announce the registration for "WWRP/WCRP S2S Summit: Advancing Sub-seasonal to Seasonal Prediction and Applications" is finally open!

In-Person Conference Registration is now open until the end of 2nd June (23:59 UTC).

For Online Conference Registration is also now open until 26th June.

More information available [here](#).

WEATHER CLIMATE WATER

WORLD METEOROLOGICAL ORGANIZATION

PRIZE CHALLENGE TO IMPROVE SUB-SEASONAL TO SEASONAL PREDICTIONS USING ARTIFICIAL INTELLIGENCE

1 June - 31 October 2021



Sub-projects Wikis

- MJO and Teleconnections (Dr. Cristiana Stan)
- Aerosols (Dr. Andrea Molod)
- Land (Dr. Paul Dirmeyer)
- Ocean (Dr. Charlotte DeMott)
- Stratosphere (Dr. Amy Butler)
- Ensembles (Dr. Yuhei Takaya)
- Research to Operations/Verification (Dr. Caio Coelho)
- Applications (Dr. Joanne Robbins, Dr. Chris White)

Regional Activities Wikis

- Africa (Dr. Zewdu T. Segele)
- Australia and South Pacific (Dr. Claire Spillman)
- South-East Asia (Dr. Thea Turkington, Mr. Tan Wee Leng)
- South Asia (Dr. Susmitha Joseph)
- East and Central Asia (Mr. Xin Hu)
- Europe (Dr. Christian Grams, Dr. Alexey Karpechko)
- North America (Dr. Andrea Lang)
- Latin America & Caribbean (Mr. Diego A. Campos Diaz, Dr. Alan Garcia)

S2S Database & Products

S2S Archiving Data Center

ECMWF

CMA

IRI/LDEO Data Lib.

ECMWF Products (graphics)

S2S Museum

Github Codes

Real-time Pilot Wiki

List of Projects participating in the S2S Real Time Pilot Initiative

Machine Learning Wiki

Forecast and verification products development

Statistics

ECMWF

Usage statistics (Data volumes, # of requests, active users, and users/country)

CMA

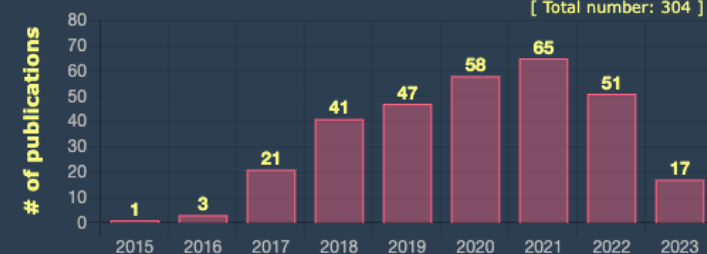
Usage statistics

IRI

Usage statistics

Publications using the S2S DB

[Total number: 304]



High-Impact Weather Core Project

Impact-based Warnings Project



Research Themes

- Predictability and Processes
- Multi-scale Forecasting of Weather-Related Hazards
- Impacts, Vulnerability and Risk
- Communication
- User-oriented Evaluation

FORTHCOMING EVENTS

CALL FOR ABSTRACTS
Open until 18 April 2023

EMS2023
EMS Annual Meeting
September 2023

#ems23 #emsannual

EMS2023 Call for abstracts is now open

3–8 September 2023 in Bratislava, Slovakia and online

WORKSHOP 2020

ICMCS-XV
15th International Conference on Mesoscale Convective Systems
22 - 25 May 2023

ICMCS-XV

Colorado State University in Fort Collins, 22 - 25 May 2023

ENDORSEMENT

IUGG BERLIN 2023
THE 28th GENERAL ASSEMBLY OF THE INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
11–20 July 2023

28th IUGG General Assembly

11-20 July 2023, City Cube, Berlin, Germany

ABOUT THE PROJECT

- Steering Group**
Lead by Brian Golding and Sally Potter
- WMO Support**
Under World Weather Research Programme (WWRP) of WMO
- Advisory Board**
Advisory Board
- International Coordination Office**
Hosted by Chinese Academy of Meteorological Sciences.

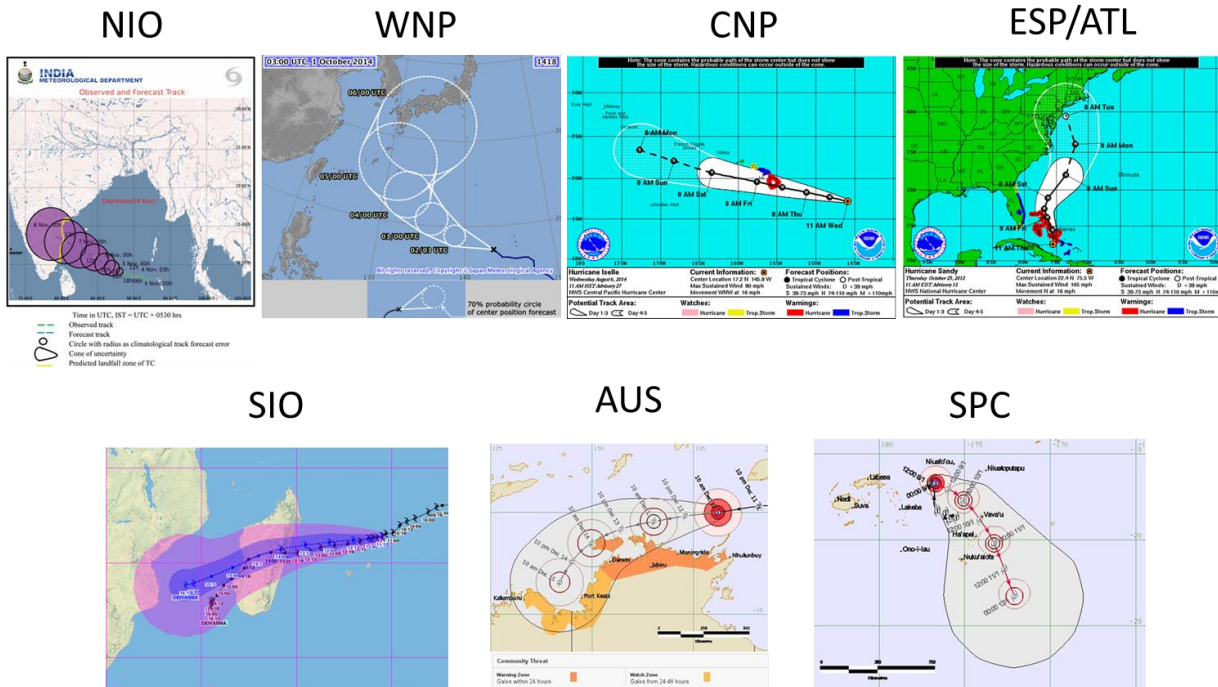
Tropical Cyclone Probabilistic Forecast Products

Lead: Jason Dunion

Examples of operational TC track forecast products

- TC-PFP has 3 phases, each working with forecast centers to help identify best practices for probabilistic forecasts of:

- **Phase 1:** TC formation and position
- **Phase 2:** TC intensity and structure
- **Phase 3:** TC-related rainfall and storm



Improving early warnings for tropical cyclones

WWRP Partner Project:

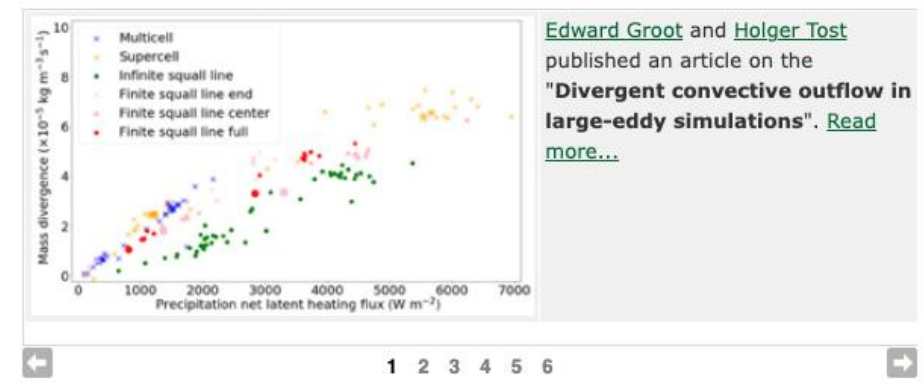
Waves To Weather

Google™ Custom Search

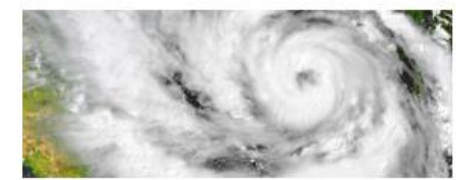
www.en.lmu.de | Meteorological Institute | Faculty of Physics | Sitemap

- WER SIND WIR? WAS MACHEN WIR? WAS BIETEN WIR AN?
- ABOUT US
- NEWS
- PROJECTS
- PEOPLE
- PUBLICATIONS
- MEETINGS
- SEMINARS
- GUEST PROGRAM
- EARLY CAREER
- EQUAL OPPORTUNITY
- COMMUNICATION
- OPEN POSITIONS
- CONTACT
- LOGIN

Waves to Weather - Transregional Collaborative Research Center (SFB/TRR165)



Who are we?



W2W Newsletter



Special Collections W2W



Of course! | Doch!



PARTICIPATING INSTITUTIONS

- LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN
- KIT Karlsruhe Institut für Technologie
- JOHANNES GUTENBERG UNIVERSITÄT MAINZ JGU
- UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386
- TUM Technische Universität München
- DLR Deutsches Zentrum für Luft- und Raumfahrt
- UH Universität Hamburg

FUNDED BY



SOCIAL MEDIA

WWRP Endorsed Projects:

TEAMx

Multi-scale transport and exchange processes in the atmosphere over mountains – programme and experiment

2nd MedCyclones & 9th European Storm Workshops

2nd MedCyclones Training School

International Conference Center
Météo-France, Toulouse

Workshop: 28 – 30 June 2023

Training School: 26 –30 June 2023

Abstract submission & Training School
application deadline:

15 March 2023

Extended only for the Workshop:

25 March 2023



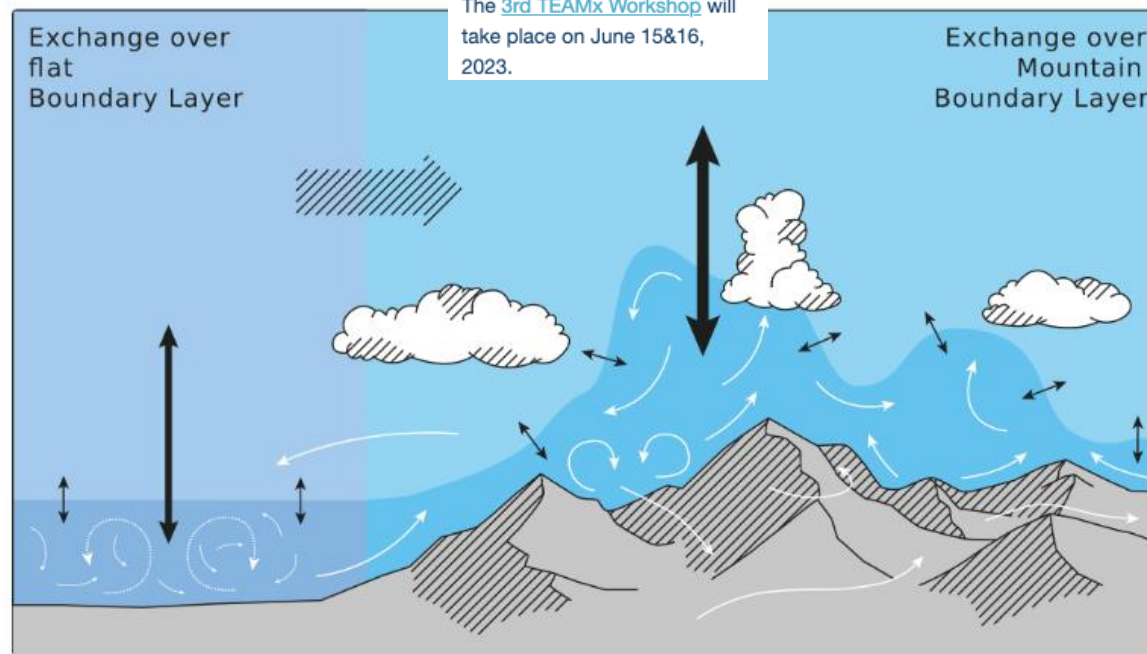
- No registration fees for both the Workshop & Training School
- Students will have the opportunity to attend both the Training School & the Workshop
- Possible COST support for travel and accommodation

More information:

medcyclones.eu/workshop23

TEAMx

The 3rd TEAMx Workshop will take place on June 15&16, 2023.

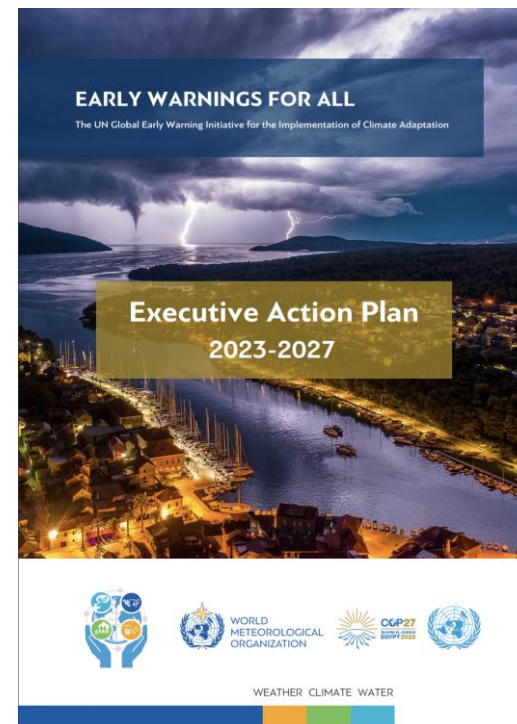


Exchange processes govern the transfer of heat, momentum and mass between the ground, the planetary boundary layer and the free atmosphere. Over mountainous terrain, exchange processes include turbulent mixing, breeze systems, gravity wave



Drivers for New WWRP Implementation Plan

- Enhancing capacity and improving outcomes in developing countries
- Early Warnings for All and Disaster Risk Reduction
- WMO: WMO Strategic Plan, 2024-2027
- WMO: Support Stronger Climate Action
- WMO: Hydrology and water management
- WMO: Global Basic Observing Network
- WMO: Earth System Science
- UN Sustainable Development Goals
- Disruptive technologies



WEATHER CLIMATE WATER

Goals (2024- 2027)

Goals



Advance Earth-system Science for Services, minutes to months

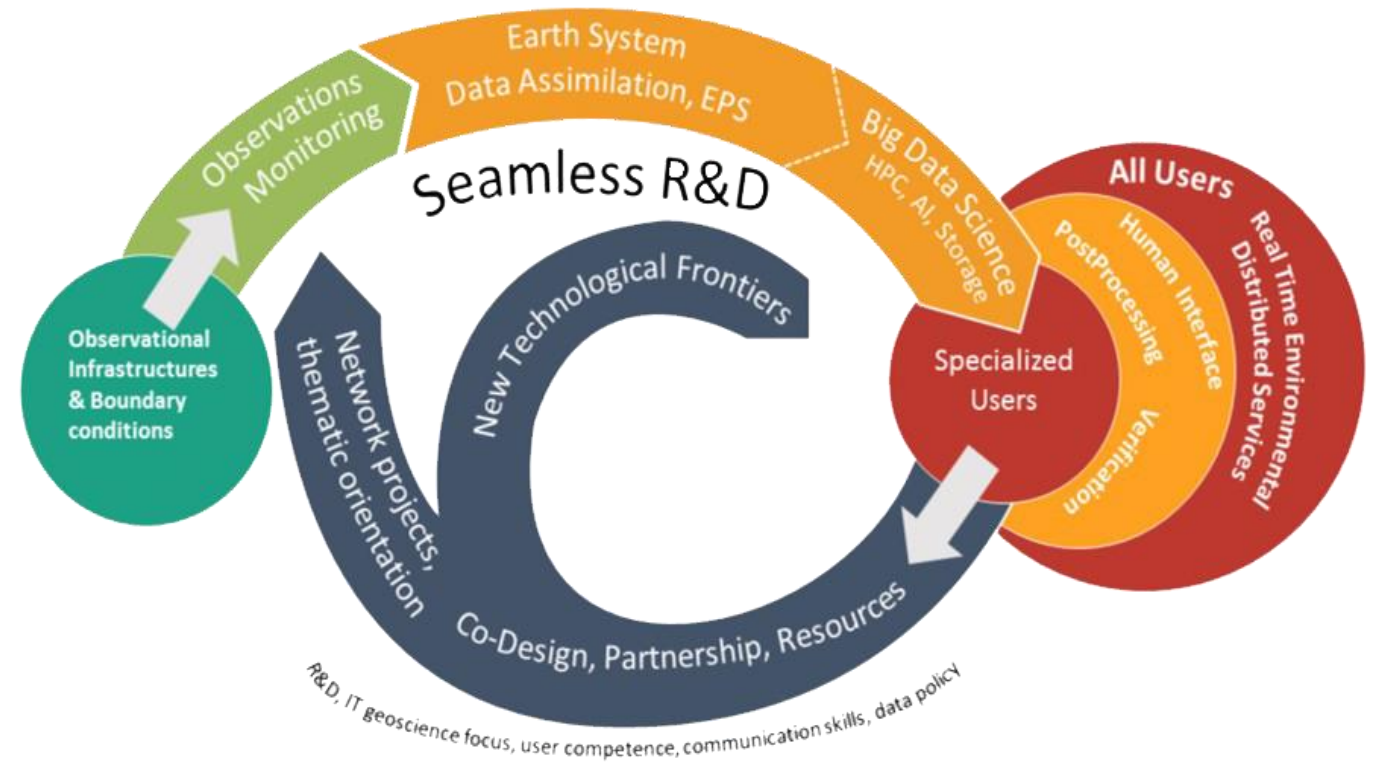


Revolutionize the warning process in a changing climate



Quantify, reduce and communicate prediction uncertainty

The Value Cycle Approach



Framework (2024 - 2027)

AWAR³E

Advancing Weather Research to
Reduce Risk to Societies



Ensure that people are **aware** of threats and mitigation actions



Be **aware** of all people and their needs



Make society **aware** of our science

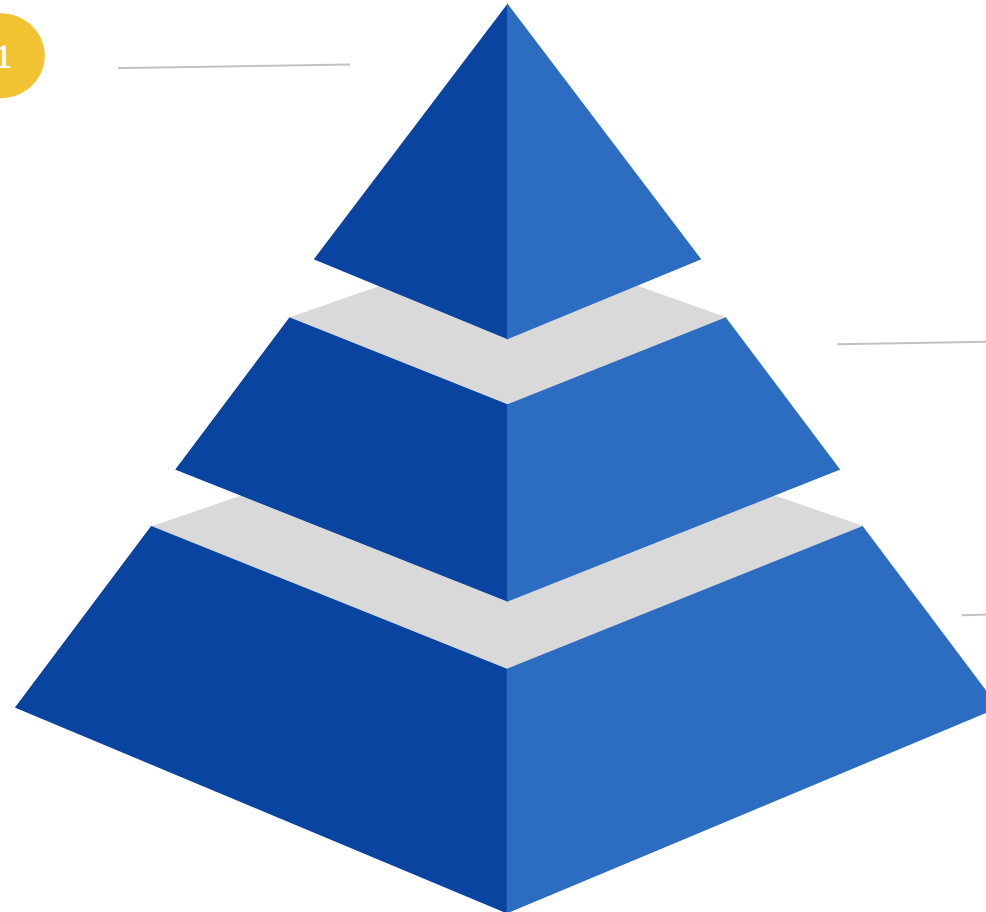


Increase forecasters' and decision makers' **awareness** of appropriate tools and techniques



Ensure that researchers are **aware** of each other's work

1



2

Projects

AvRDP, Paris Olympics,
Tropical Cyclones and
other new Projects

3

Working Groups

Reservoirs of expertise
and innovation

Projects

World Weather Research
Programme Implementation Plan
2024-2027



Polar Coupled Analysis and Prediction for polar Services



Sub-seasonal to seasonal applications for Agriculture and Environment



Understanding vulnerability, ultra-fine-scale prediction for multi-hazards in cities



Science of Hydrology, precipitation and Weather for Risk reduction



Public Engagement of Practitioners, Learners and Educators



Satellite-based Nowcasting in Africa



Sub-seasonal to seasonal applications for Agriculture and Environment

Co-leads: Steve Woolnough (UK) and Victor Marchezini (BR)

Themes:

- Build on successes of S2S project (S2S database and pilot applications)
- Determine where forecasts will/will not exhibit skill for extreme weather
- Communicate appropriate actions under uncertainty
- Tailored and co-produced products for specific user groups
- Co-design of effective metrics with information users.

(Images courtesy Wayne Twine, Wits Rural Facility)



- *Agriculture*
- *Water resources*
- *Health*
- *Renewable energy*

Hydrology and Precipitation

co-leads: Céline Cattoën-Gilbert (NZ) and Rachel Hogan (US)

Themes:

- Integrated prediction of precipitation and hydrological processes on short time scales (minutes to days)
- Advancement of warning strategies associated with multi-hazards and their interdependencies affecting the water cycle.
- Socio-hydrometeorology: dynamic interactions and feedbacks between weather, water and people, and citizen science
- Builds on the goals of the hydrology initiative in WMO to ensure that communities are prepared for flooding events of different types.



Public Engagement of Practitioners, Learners, and Educators (PEOPLE)

Themes

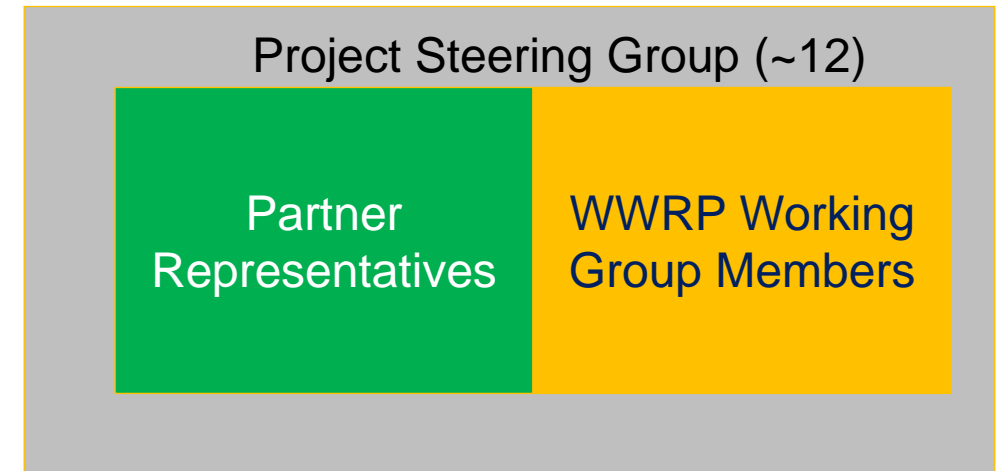
- The role of various knowledges adding to WWRP knowledge creation and outputs (e.g. Indigenous knowledges)
- Two-way dialogues on how various communities use information and provide inputs to WWRP
- Enhance information for users through expertise in behavioural science, communication practices, etc.
- Expanding, extending and enhancing citizen science initiatives
- Developing a communication and outreach strategy for WWRP.



How Will Projects Work?

All Projects:

- Adhere to WWRP Terms of Reference
- Have a Steering Group to guide and execute project
- Utilize partners to extend research foci of WWRP
- Nominal 5-year duration, renewable
- Integrate across disciplines
 - Co-chairs from both physical and social sciences
 - Involve multiple working groups
 - Connections to GAW and WCRP
- Should emphasize
 - research to "operations"
 - well defined "stakeholders" (clarity on who this work will benefit)

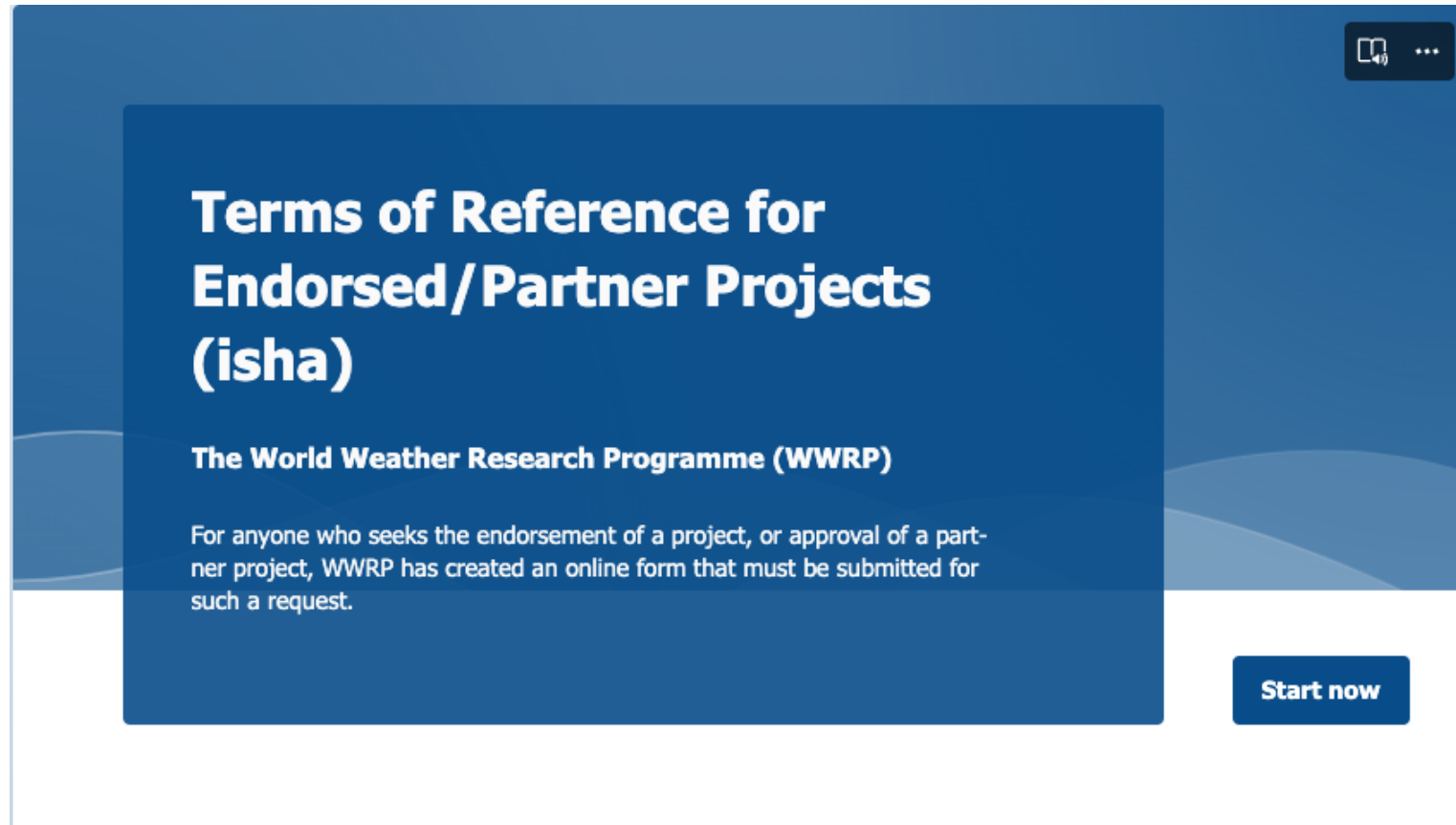


WWRP Looking Ahead

- Building on successes of Core Projects (S2S, PPP and HI-Weather)
- Advancing the “Science for Services” value cycle approach
- Centering improvement of early warnings as an outcome of research
- Strengthening partnerships across WMO and the community to realize WWRP goals



Endorsement



**Terms of Reference for
Endorsed/Partner Projects
(isha)**

The World Weather Research Programme (WWRP)

For anyone who seeks the endorsement of a project, or approval of a partner project, WWRP has created an online form that must be submitted for such a request.

[Start now](#)

<https://community.wmo.int/en/activity-areas/wwrp>

Form Coming Soon

Thank You



For any queries, please contact:
Chris Davis: cdavis@ucar.edu
Estelle de Coning: edeconing@wmo.int



For more information, consult
World Weather Research Programme
(WWRP) | World Meteorological
Organization (wmo.int)



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World Meteorological Organization
(wmo.int)