



WORLD CLIMATE RESEARCH PROGRAMME

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WGNE33-PDEF4, Tokyo, Japan
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2015: A Landmark Year

- Over 190 countries signed up to **reduce emissions**, with the target to stay within a 2°C world.
- 15-year agreement for the substantial **reduction of disaster risk and losses in lives, livelihoods and health**.
- 2030 agenda with 17 sustainable development goals to **end poverty and hunger, improve health and education, making cities more sustainable, combating climate change, and protecting oceans and forests**.

Understanding and Quantifying Weather and Climate Risk are at the Core of these Actions

The Future of WCRP

The Science Requirements are Changing

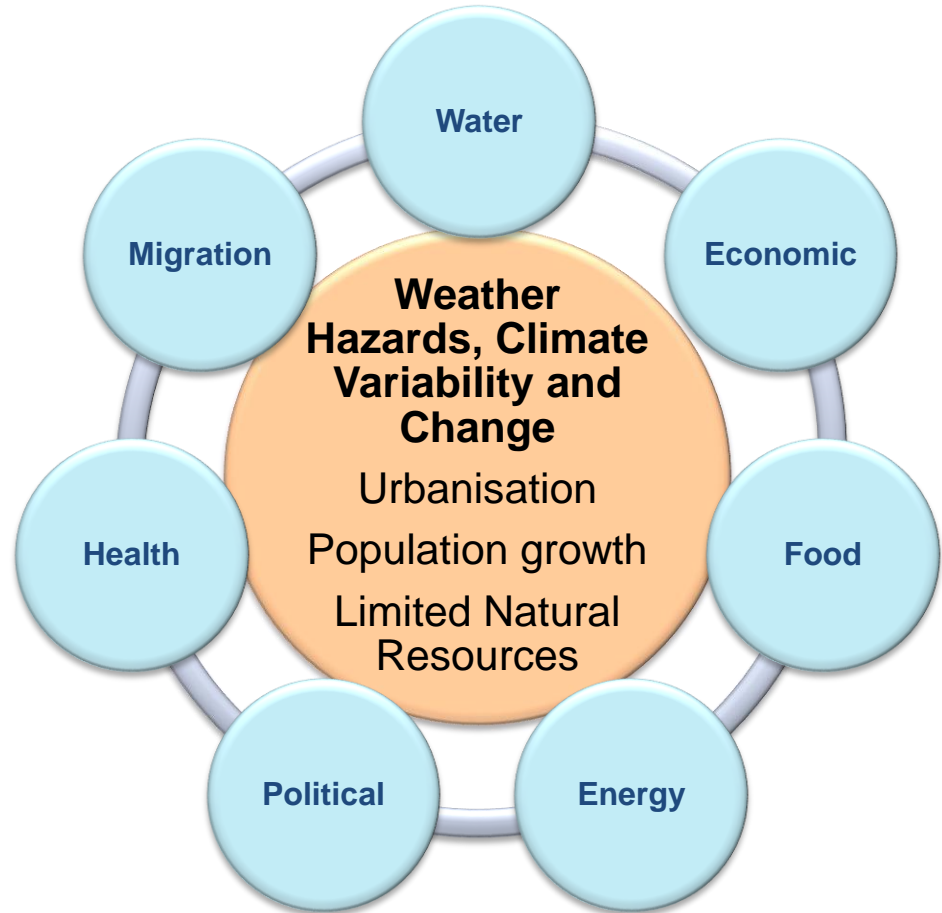


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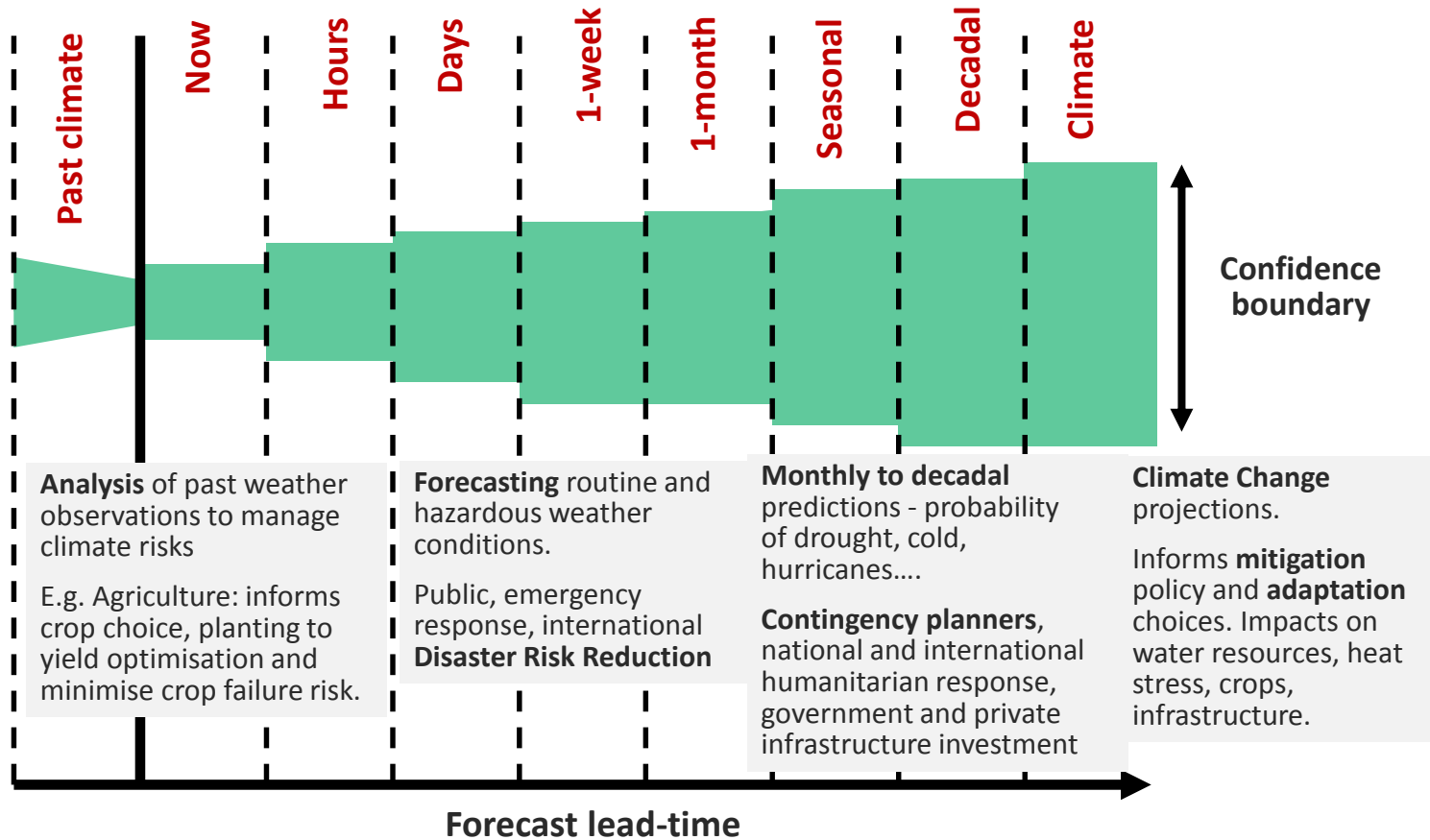


21st CENTURY CHALLENGES IN AN INTERCONNECTED WORLD

Exposure to extreme weather and climate events threatens to derail the sustainability of economic development and social welfare across the globe, and to threaten the securities on which we rely for our health and well-being.



New Tools in the Toolbox: Seamless Prediction Across Timescales

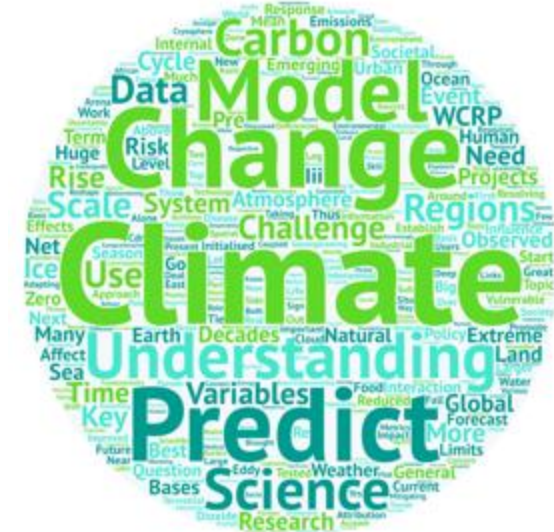


WCRP Strategic Plan

- WCRP is developing a new **Strategic Plan**, covering a 10-year time horizon (2019-2029)
- Takes into account the outcomes of the **co-sponsors review** (finalized in June 2018)
- Importance of **bedrock science**, **seamless** approach (time, space, ESM, R-O) and **links to services and policy** emphasised
- Accompanying **Implementation Plan** under development



Strategic Plan 2019-2029



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WCRP Strategic Plan

Overarching Objectives

Processes and Feedbacks to Close the Energy, Water and Carbon Cycles

Improving Predictions and Quantifying Uncertainties

Constraining Projections and Identifying Sensitivities

Connecting Climate Science to Decisions

Bedrock Science (Emphases)

Tools and Capabilities (Imperatives)

Partnerships



Understand Earth's Climate

Constrain Future Climate

Connect with Decision Makers



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WCRP
World Climate Research Programme

WCRP Strategic Plan

Timeline

- SWOT Analysis Sep -Nov 2017
- Writing of Initial Strategic Plan Draft Nov 2017 - Feb 2018
- WCRP Strategic Plan Writing Retreat, IOC Paris Feb 2018
- WCRP Community Consultation March 2018
- JSC-39, Nanjing Apr 2018
- Public Consultation 1 June – 31 Aug 2018
- Town Hall at AGU to Release the Strategic Plan Dec 2018



WCRP structure

JOINT SCIENTIFIC COMMITTEE (JSC)

WCRP MODELLING ADVISORY COUNCIL (WMAC)

WCRP DATA ADVISORY COUNCIL (WDAC)

WORKING GROUPS ON:

COUPLED MODELLING (WGCM)
NUMERICAL EXPERIMENTATION (WGNE)

SUBSEASONAL TO INTERDECADAL PREDICTION (WGSIP)
REGIONAL CLIMATE (WGRC)



CRYOSPHERE-
CLIMATE



OCEAN-
ATMOSPHERE



LAND-
ATMOSPHERE



SPARC
Stratosphere-troposphere
Processes And their Role in Climate
TROPOSPHERE-
STRATOSPHERE



REGIONAL CLIMATE
DOWNSCALING

JOINT PLANNING STAFF (JPS)

GRAND CHALLENGES

CLOUDS, CIRCULATION AND CLIMATE SENSITIVITY

NEAR-TERM CLIMATE PREDICTION

REGIONAL SEA-LEVEL CHANGE AND COASTAL IMPACTS

MELTING ICE AND GLOBAL CONSEQUENCES

CARBON FEEDBACKS IN THE CLIMATE SYSTEM

WATER FOR THE FOOD BASKETS OF THE WORLD

UNDERSTANDING AND PREDICTING WEATHER AND CLIMATE EXTREMES

Questions by
review panel
about the
**CURRENT WCRP
STRUCTURE**

Core Projects stuck in
disciplines?

Where is whole system
approach?

Where is next
generation model
development?

Where is the pathway to
climate services?

Where is climate
change?

**CURRENT STRUCTURE IS
NOT THE STRUCTURE
FOR THE FUTURE**

Model development, as proposed in the WCRP Sponsors' review

WCRP CAPABILITY THEMES

EARTH SYSTEM PROCESSES ACROSS SCALES

Jointly with WWRP

Energy, Water & Carbon Cycles;
Fundamental Atmospheric Physics (e.g. Convection);
Land Surface Processes & Land-Atmosphere Coupling;
Ocean Processes & Ocean-Atmosphere Coupling;
Cryosphere Processes

CLIMATE VARIABILITY, PREDICTABILITY & PREDICTION

Ocean, Land, Cryosphere, Atmosphere & Solar Drivers;
Climate Dynamics, Modes of Variability & Teleconnections; Monthly to Decadal Predictability & Prediction

CLIMATE CHANGE AND EARTH SYSTEM FEEDBACKS

Jointly with AIMES

Climate Change Forcing & Sensitivity;
Climate Change Attribution;
Climate Change Projections (Global & Regional) for Mitigation & Adaptation;
Abrupt Climate Change;
Geoengineering Assessment

WCRP CROSS-CUTTING RESEARCH PROJECTS (*on occasions with WWRP, Future Earth.....*)

WCRP WORKING GROUP ON CLIMATE MODEL DEVELOPMENT

Identifying Systematic Errors; Improving Climate Models & Building Next Generation Earth System Models; Planning for Exascale Computing

A clear opportunity for WGNE to move into a new era of Earth System model development, in the context of predictability, ensemble forecasting, data assimilation, etc

International Conferences on Subseasonal to Decadal Prediction

Many hot topics common to weather and climate communities:

- Predictability, skill
- Dynamics, teleconnections
- Ensemble prediction, generation, size
- Earth System models, coupling
- Systematic errors, shocks, drifts
- ...

Timely Joint WGNE33-PDEF4 meeting!

17 - 21 September 2018 | NCAR, Boulder, CO, USA



Thank You
(and in particular to JMA for
hosting this meeting)



WMO



IOC



ICSU

International Council for Science



www.wcrp-climate.org





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New Tools in the Toolbox: Seamless Prediction Across Space Scales



N x Global predictions at ~10km
with lead times of days to years:

Synoptic drivers

<N x Regional predictions at
<1km with lead times of hours to
years:

Local meteorology

Probability of local
hazards:
**Impact Scenarios &
Narratives**

TAKING A HOLISTIC VIEW OF THE EARTH SYSTEM

