Detlef Stammer and Helen Cleugh
May 2019
Geneva, Switzerland
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
Troposphere-Stratosphere
Regional Climate Downscaling

GRAND CHALLENGES
CLOUDS, CIRCULATION AND CLIMATE SENSITIVITY
REGIONAL SEA-LEVEL CHANGE AND COASTAL IMPACTS
CARBON FEEDBACKS IN THE CLIMATE SYSTEM
NEAR-TERM CLIMATE PREDICTION
MELTING ICE AND GLOBAL CONSEQUENCES
WATER FOR THE FOOD BASKETS OF THE WORLD
WEATHER AND CLIMATE EXTREMES
CMIP is a project of WCRP’s Working Group on Coupled Modeling (WGCM)

CMIP has led to an improved understanding of past, present and future climate change and variability in a multi-model framework

CMIP defines common experiment protocols, forcings and output

21 CMIP6-Endorsed MIPs
CORDEX scientific challenges:

- **Added value** of downscaling, scales, bias and uncertainties, user-oriented metrics
- Understanding and simulating **human elements**, e.g. land use, urban development, climate and coastal cities
- Coordination of regional **coupled modeling**
- Precipitation, e.g. convective systems, monsoon
- Local wind systems

Advancing the science and application of regional climate downscaling, for improved regional climate information
The Future of WCRP

The Climate Science Requirements Changed
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 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 Review of WCRP
Unwieldy, complex and confusing.
Core Projects stuck in the past?
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**
The Future of WCRP

The New Strategic Plan of WCRP
WCRP Strategic Plan

- WCRP developed a new **Strategic Plan**, covering a 10-year time horizon (2019-2028)
- Takes into account the outcomes of the **co-sponsors review** (finalized in June 2018)
- Importance of **basic science, seamless approach** (time, space, ESM, R-O) and links to services and policy emphasised
- Accompanying **Implementation Plan** under development
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.
But: Climate Change cannot be seen in isolation. It must be addressed together with the other grand challenges facing society.

From ideas
To implementation

DISCIPLINES
Natural Sciences
Social Sciences
Medicine
Technology
GLOBAL IMPACT / INTEGRATED SYNTHESIS

Knowledge transfer

Global Earth observatory
- High-quality open data

Innovations and policy impact

Regional and sectoral impact

Requires Strategic Partnerships
Vision and Mission

• New Vision
A world that uses sound, relevant and timely climate science to ensure a more resilient present and sustainable future for humankind.

• New Mission
The World Climate Research Programme (WCRP) coordinates and facilitates international climate research to develop, share and apply the climate knowledge that contributes to societal well-being.
WCRP Strategic Plan

WCRP Scientific Objectives

1. Fundamental understanding of the climate system
2. Prediction of the near-term evolution of the climate system
3. Long-term response of the climate system
4. Bridging climate science and society
Status of WCRP Strategic Plan

- Draft completed in November 2018
- Presented at AGU meeting in December 2018
- Sent to WCRP Sponsors; comments received
- Implemented changes; final version agreed on by JSC April 2019
- To be sent to Sponsors for final agreement
General Considerations

- **Strategic Plan** = the ‘what’
  - Follows the vision, mission and context evolution
  - Positioning, niche, relevance, new directions, focus on big picture
  - Two purposes: galvanize the community, marketing tool

- **Implementation Plan** = the ‘how’, setting the Strategic Plan in motion, should naturally follow the logic of the Strategic Plan
  - Resources
  - Structures
  - Milestones
  - Deliverables
  - Measures of Success
  - Risk assessment, etc...
The Future of WCRP

The Implementation Plan
A Framework for Implementing the WCRP Strategic Plan
1. Fundamental processes – academic community
   - Revisiting aggregation and scaling
   - Process understanding and parameterization
   - Society’s need for prediction and attribution: what needs to be done to improve it?
   - Climate sensitivity - fundamental science
   - Reservoir changes (heat/carbon/water)
   - How does our science and knowledge adapt to new and disruptive technologies such as advances in machine learning / data assimilation / data fusion...

2. Climate services community (e.g. GFCS)
   - Society’s need for prediction and attribution: what needs to be done to improve it? [Earth system/Environmental prediction]
   - Prediction, attribution and evolution of Extremes
   - Regional hotspots (e.g. high latitudes, Pacific Islands) - sensitivity and human impacts
   - How will climate interact with overall development trends, including urbanization?
3. Scenarios (e.g. IPCC community)
- Climate sensitivity - communication of uncertainty
- Prediction, attribution and evolution of Extremes
- Reservoir changes (heat/carbon/water)
- Impact of different forcings (aerosols)

4. Mitigation/Adaptation community, Post-Paris Agreement, Decision-makers and doers (e.g. UNFCCC, urban planners, etc.)
- Geoengineering: assess impact; prediction and attribution
- How will climate interact with overall development trends, including urbanization

And a process for reviewing and refining these including via consultation
Implementation Plan – Draft Structure

1. Introduction
2. The WCRP Strategy: Vision, Mission and Objectives
3. Engagement
4. Conceptual Framework
5. Partnerships
   - Identifying key Partners
   - Co-designing Science Questions
   - Identifying common infrastructure
   - Clarifying their role in the Strategy
   - Reaffirming current, and building new
6. Implementation
   - Transition Plan
   - Schedule: Gant Chart, Milestones, Deliverables
7. Measures of Success
8. Risks and contingencies

Up to April 2022
Fully consultative

By April 2020

- Support Functions (incl. support offices)
- External Governance: Sponsors, JSC, Governing Board, JPS
- Internal Structure and Governance
- Resources, budgets, finance management
## Implementation Plan – Action Elements

### Research Projects
- Lifecycle (start and end) with a clear timeline and deliverables
- Joint and co-designed with Partners outside WCRP
- Deliver to Strategic Plan Objectives
- WCRP attributes: Integration; Scale; Relevance; Climate Change; Discovery and Innovation

### Conferences, Workshops, WCRP Forum?
Projects and fora to engage and empower ECRs; and regional partners: part of the WCRP family

### Regular Syntheses, Assessments, Gap Analyses
Rapid Assessments and Reports

### Reference data sets (observed, modelled)

### Educational services and activities

### Coordination
- Stakeholder engagement and outreach
- Capacity building and communication

### Enduring capability - people:
- Climate System Elements
- Infrastructure and Integration
1. Now to April 2020 (JSC-41)
   - Refine science questions and conceptual framework
   - Refine key elements for delivery and engagement
   - Science, funding and infrastructure needs

2. Then: up to 2 years for consultation and development of a new structure, governance: by April 2022 (JSC-43)
   - In parallel – develop and deliver syntheses of core activities

3. Then: up to a further 2 years to transition to the new structure and governance: by April 2024 (JSC-45)