



WORLD CLIMATE RESEARCH PROGRAMME

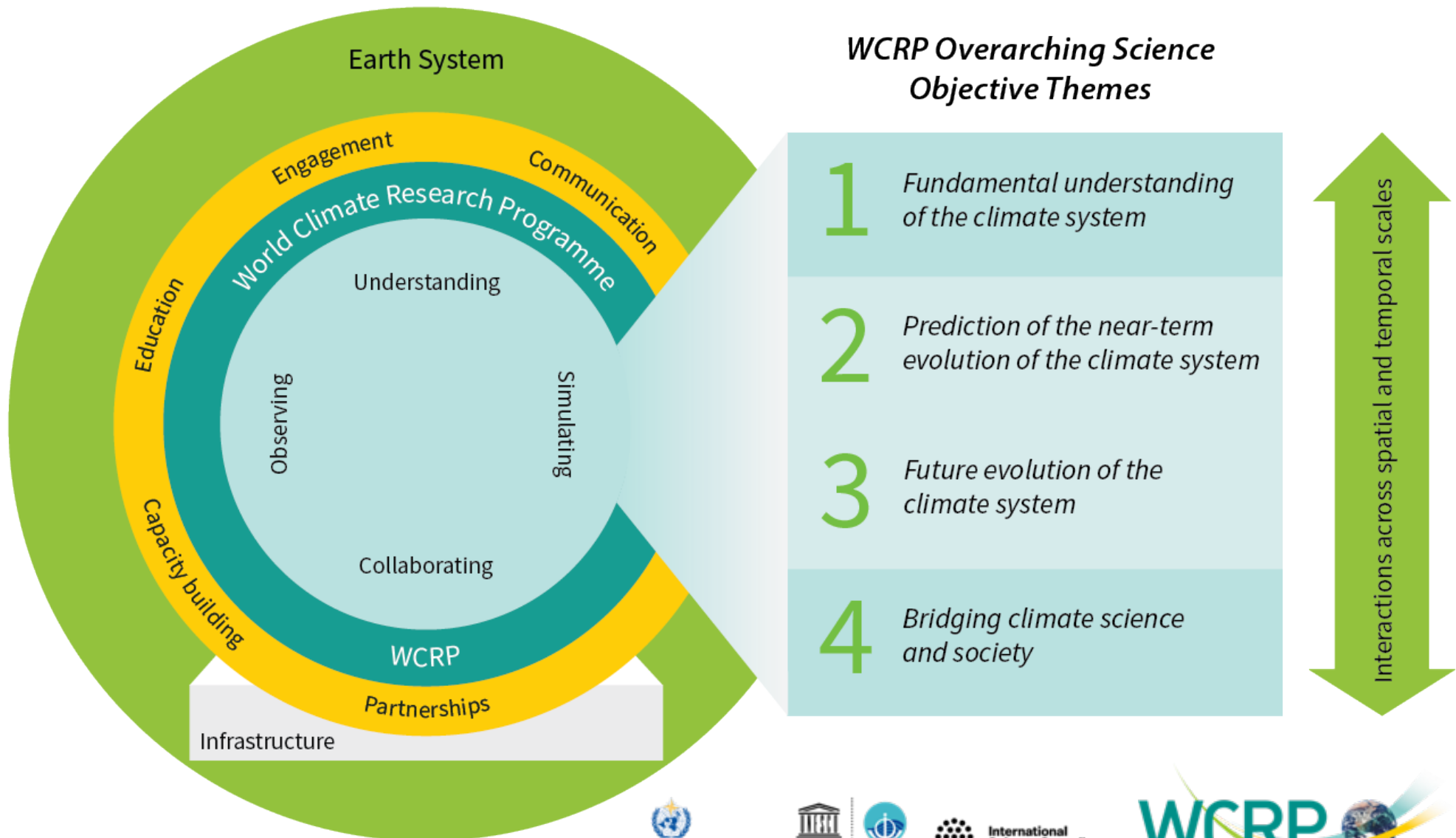
Michel Rixen
WGCM22
25-29 March 2019
BSC, Barcelona, Spain



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WCRP Strategic Plan



WCRP Strategic Plan

Objective 1

We need fundamental science to prepare society for unforeseen challenges.



Advancement of sciences that enable an integrated and **fundamental understanding of the climate, its variations and its changes, as part of a coupled** physical, biogeochemical, and socio-economic **system**.

Emphases:

- Climate dynamics: past and future global and regional changes in oceanic and atmospheric circulations
- Reservoirs and flows: radiative, hydrologic, cryospheric and biogeochemical changes on energy, water, carbon, and other climate-relevant compounds



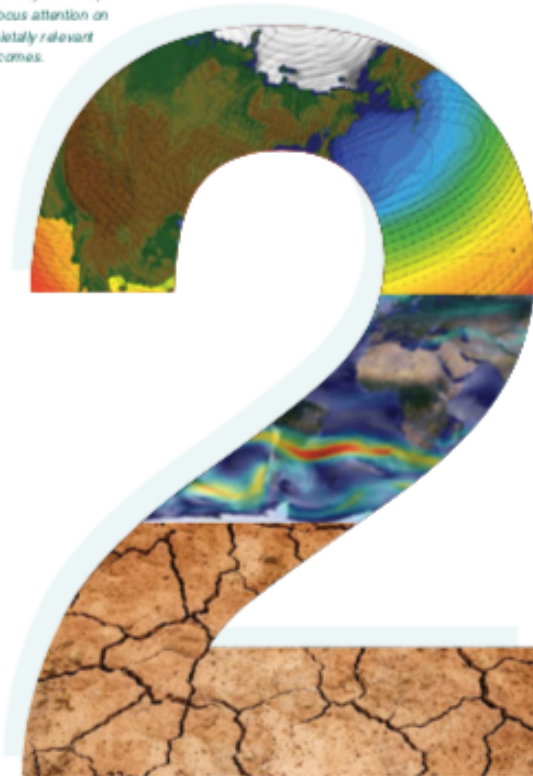
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Objective 2

Understanding predictability in the climate system helps to focus attention on societally relevant outcomes.



Frontiers of **predictions and quantify the associated uncertainties** for sub- seasonal to decadal time scales across all climate system components.

Emphases:

- Simulation capabilities of component systems and their coupling. Deterministic, statistical and machine learning approaches. Data assimilation and ensemble generation
- Predicting extreme events: regional climate hotspots and potential for crossing thresholds. Interactions between fast and slow extremes

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Objective 3

Quantify the responses, feedbacks and uncertainties intrinsic to the changing climate system on longer timescales.

Emphasis:

- Earth system models. Development and integration. Representation of complex interactions between aquifers, vegetation and soil carbon, between permafrost, glaciers, and ice-sheets. Dynamical and statistical downscaling



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Objective 4

Innovation in the generation of decision-relevant information and **knowledge about the evolving Earth system.**

Emphasis:

Interactions with social systems: Social processes and **emergent behaviour in the Earth System. Interactions and feedbacks between climatic and socioeconomic systems**

Engaging with society: Actionable climate information, **scientific assessments**, educational approaches and public communication strategies.

Climate information presents tremendous opportunities to collaborate with civil society, government and private industry to safeguard lives and valued assets.



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WCRP New Strategy

Critical Infrastructures

- I. **A hierarchy of modeling tools**
- II. Observations for process understanding
- III. Sustained reference data
- IV. **High-end computing and data management**



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Relevant timeline

- WGCM22 Barcelona

Feeding into:

Ro

- Retreat 4-5 May, Geneva: first brainstorm on TP/IP
- JSC40 6-10 May, Geneva: consolidation of inputs into TP/IP
- WMO 18th Congress, June'19: reform – CMIP INF document
- AGU Fall Meeting, 9-13 Dec 2019



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Global Climate Indicators

Temperature
and Energy

Atmospheric
Composition

Ocean
and Water

Cryosphere

Surface
Temperature

Atmospheric
CO₂

Ocean
Acidification

Glaciers

Ocean
Heat

Sea
Level

Arctic and
Antarctic
Sea Ice
Extent

Thank You

www.wcrp-climate.org

WCRP 
World Climate Research Programme



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METEOROLOGICAL
ORGANIZATION



United Nations
Educational, Scientific, and
Cultural Organization



Intergovernmental
Commission on
Climate Change



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