

# WCRP Implementation Plan

from  
Strategy  
to  
Action



WORLD  
METEOROLOGICAL  
ORGANIZATION



United Nations  
Educational, Scientific and  
Cultural Organization



Intergovernmental  
Oceanographic  
Commission



International  
Science Council

October 2019

# WCRP Strategic Plan 2019-2028



- Developed 2017-2019 with extensive consultation
- Approved June 2019

## Our Vision

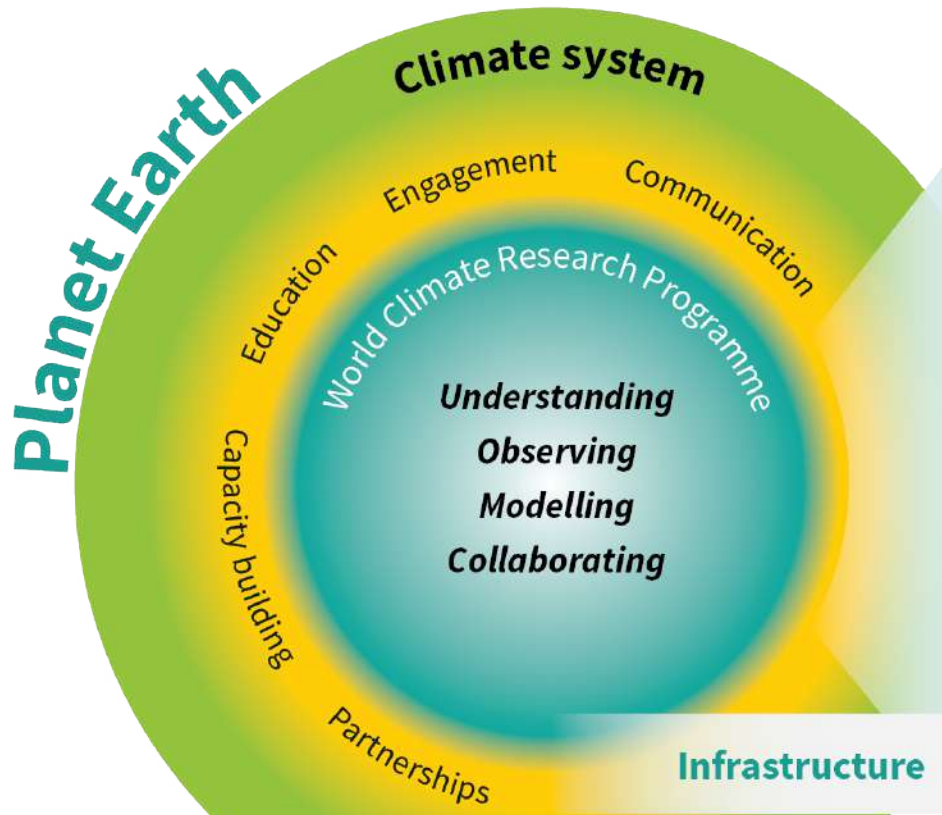
A world that uses sound, relevant, and timely climate science to ensure a more resilient present and sustainable future for humankind.

## Our 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: Overview



## Scientific Objectives

1	<i>Fundamental understanding of the climate system</i>
2	<i>Prediction of the near-term evolution of the climate system</i>
3	<i>Long-term response of the climate system</i>
4	<i>Bridging climate science and society</i>



- A hierarchy of simulation tools
- Sustained observations and reference data sets
- Need for open access
- High-end computing and data management

# Scientific Objectives



We will support and facilitate the 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:

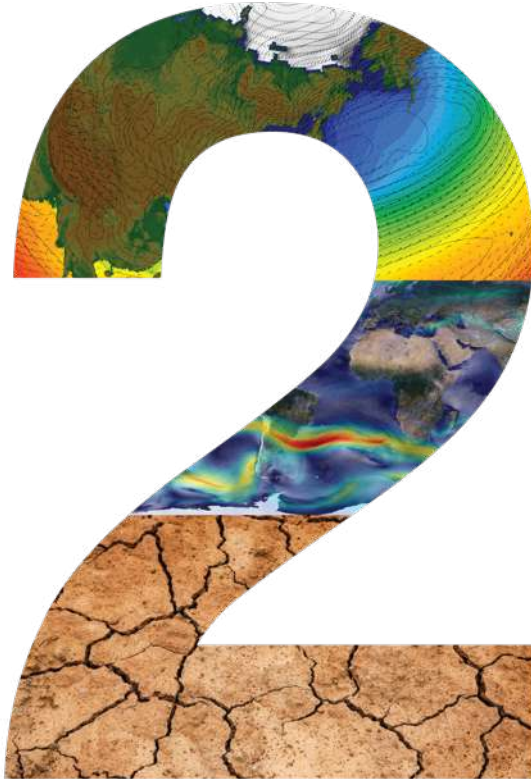
- **Climate dynamics:** past and future global and regional changes in oceanic and atmospheric circulations
- **Reservoirs and flows:** radiative, hydrologic, cryospheric and biogeochemical changes to the reservoirs and flows of energy, water, carbon, and other climate-relevant compounds

# Scientific Objectives

We will push the frontiers of predictions and quantify the associated uncertainties for sub-seasonal to decadal time scales across all climate system components.

Emphases:

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



# Scientific Objectives



We will quantify the responses, feedbacks, and uncertainties intrinsic to the changing climate system on longer (decadal to centennial) timescales.

Emphasis:

- **Simulation capabilities:** Development of integrated models that account for the slowly varying interactions and highly non-linear processes. Representation of the complex interactions between aquifers, vegetation and soil carbon, permafrost, glaciers, and ice sheets, and human activities



# Scientific Objectives

We will support innovation in the generation and delivery of decision-relevant information and knowledge about the evolving Earth system.

Emphases:

- **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



# Critical Infrastructure

- I. A hierarchy of simulation tools
- II. Sustained observations and reference data sets
- III. Need for open access
- IV. High-end computing and data management





# WCRP Implementation Plan: Background

## What is an Implementation Plan?

- It will put the WCRP Strategic Plan into action
- It will include: resources, structures, milestones, deliverables, measures of success, risk assessment

## Development of the Implementation Plan must:

- Be a transparent «bottom-up» approach involving the entire community
- Include consultation with the scientific community, agencies, academies, sponsors and other stakeholders
- Ensure a fit-for-purpose structure, an effective governance, required resources, budgets and finance management.

# WCRP Implementation Plan: Timeline

## Phase I: From now to April 2020

- Refine science questions and conceptual framework
- Refine key elements for operations, delivery and engagement
- Identify science, funding, and infrastructure needs
- Undertake consultation
- Produce the first draft of the Implementation Plan by the time of the 41st Session of the JSC, April 2020

## Phase II: April 2020 to April 2022

- Undertake further consultations and evolution of the Implementation Plan
- Develop structure and governance model
- Clarify the future of Core activities and Project Offices
- Initiation of new, joint activities
- Expand and consolidate partnerships for mutual benefits
- Adopt Implementation Plan and agree on Transition Approach by the 43rd Session of the JSC, April 2022

# WCRP Implementation Plan: Progress

## Implementation and Transition Meeting, 4-5 May 2019

Representatives of the WCRP community discussed how to implement the WCRP Strategic Plan, starting with the:

- WCRP Strategic Plan
- Feedback from the WCRP Review
- Responses to an on-line survey

## WCRP Joint Scientific Committee Session (JSC-40), 6-10 May 2019

Further discussion and refinement, with the main outcomes of:

- Engagement, dialogue and discussion: community-building and a community effort
- Development of draft Key Science Question areas and key elements
- A “Conceptual Framework” for implementing the WCRP Strategic Plan



# Key Science Question areas

Considering all scales

How to improve climate modelling and process understanding?

Aggregation and scaling

Aerosols

What is the impact of different forcings?

How can we better understand climate sensitivity?

What fundamental science is needed?

How can we communicate uncertainty better?

Parameterization

How can we make predictions more useful and relevant to society's needs?

Disruptive technology

How can we improve climate predictions?

What opportunities do new technologies provide?

What will happen in the high latitudes?

What will be the impact of Geoengineering?

Is response action needed?

What does society need to know?

Data-model fusion

What can we expect in regional climate hotspots?

Attribution

Prediction

What will happen to low-lying islands?

How will climate extremes occur in the future?

Evolution

How will reservoirs change in the future?

Heat

Carbon

What is the interaction between climate and development trends?

Urbanization

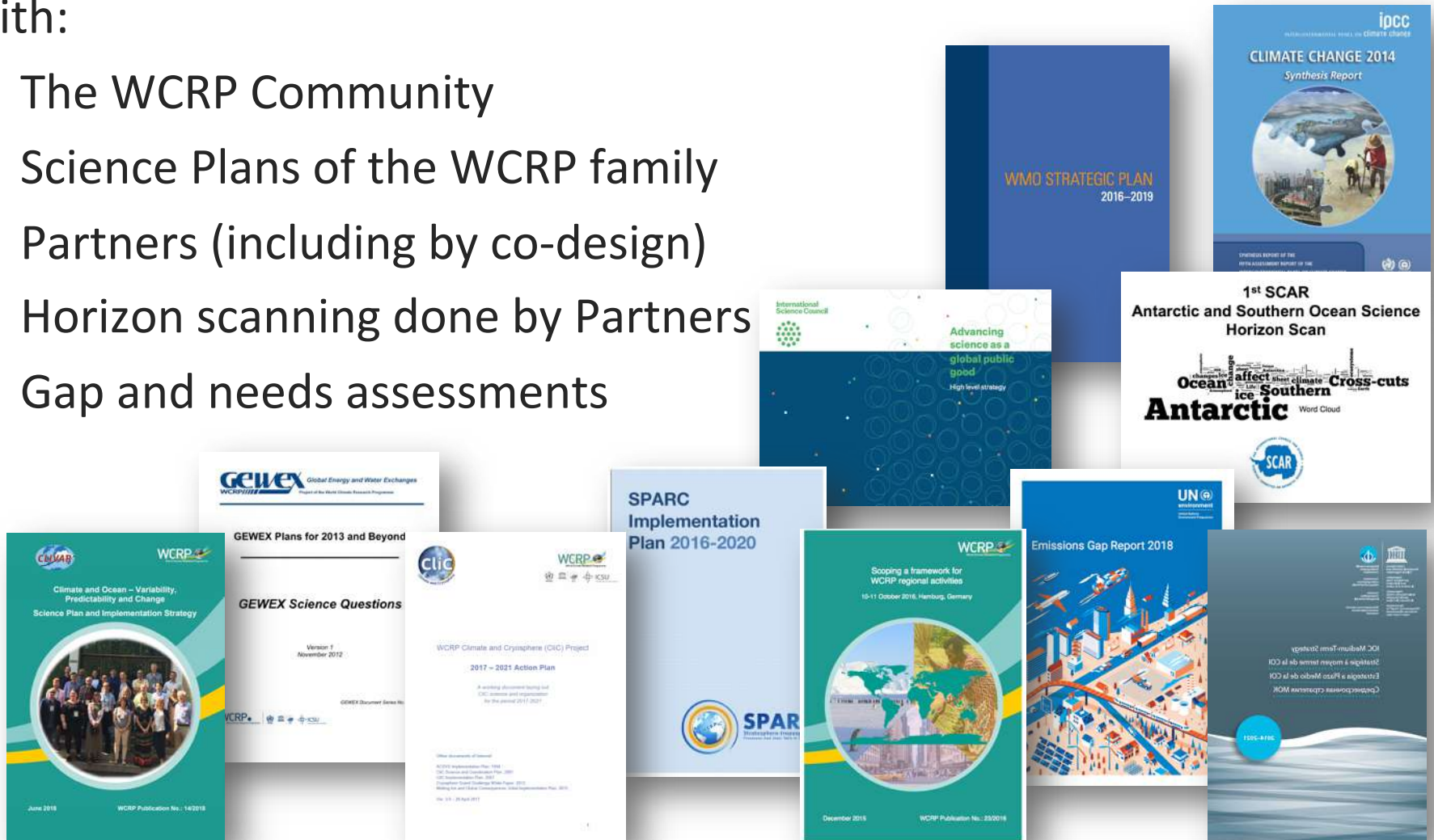
Land-use Change

Water

# Refining Key Science Question areas

We will refine science question areas via consultation with:

- The WCRP Community
- Science Plans of the WCRP family
- Partners (including by co-design)
- Horizon scanning done by Partners
- Gap and needs assessments



# Implementation Plan 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

Jointly through dialogue and co-design

Conferences, Workshops, WCRP Forum

**Enduring capability - people:**  
Climate System Elements  
Infrastructure and Integration

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)

Evaluations, Inter-comparisons, Benchmarking, Standards

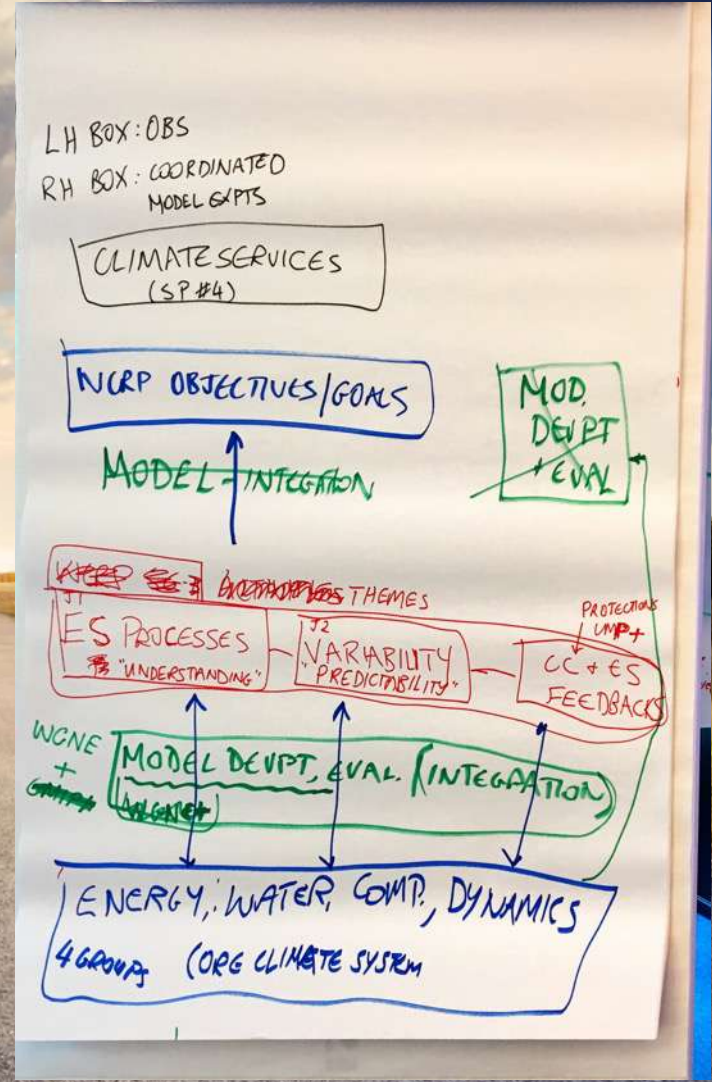
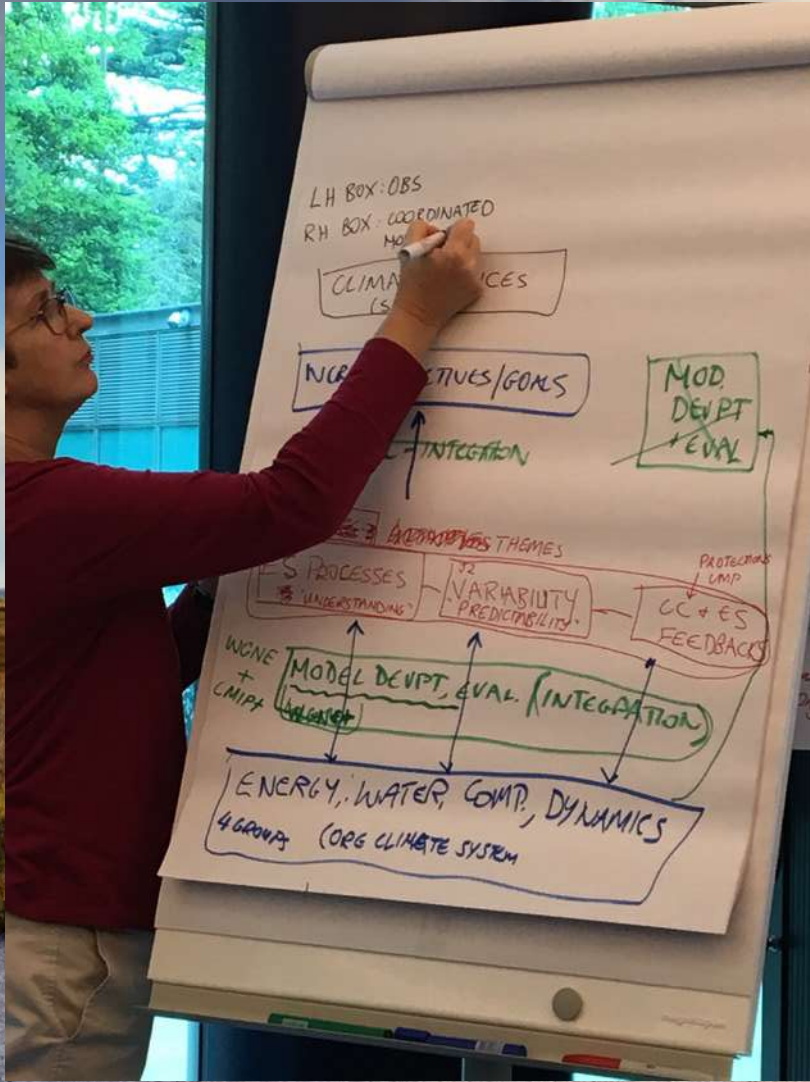
Coordination

Educational services and activities

Stakeholder engagement and outreach

Capacity building and communication

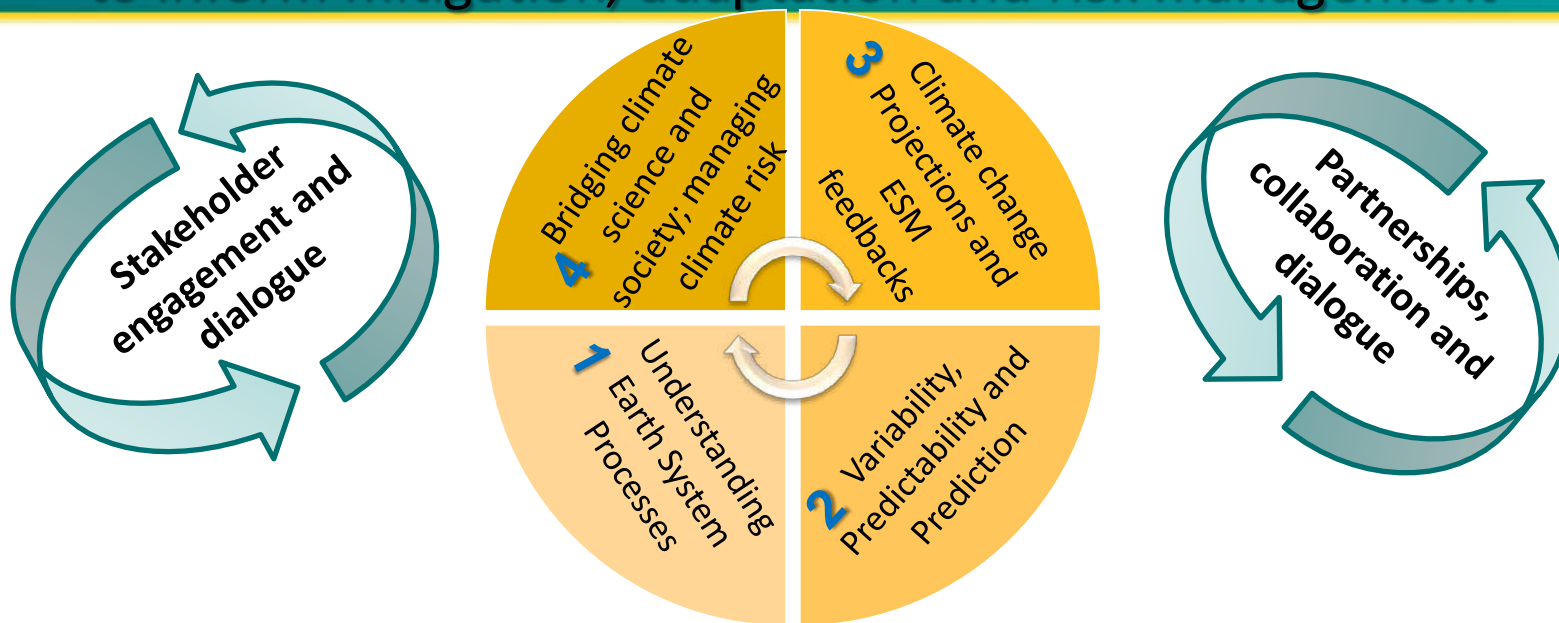




Conceptual Framework:

from this to...

# WCRP Mission: Societally-relevant knowledge and information to inform mitigation, adaptation and risk management



**Science Questions: Relevance, Innovation, Discovery, Integration**

**Function: Integration across Earth System (Local to Regional to Global)**

Earth System Model Development | Observing system innovation and evaluation | Model – Data fusion  
Fora and services for Capacity development, Education, Community building

**Function: Infrastructure**

Simulation tools | Seamless data | Sustained obs. | High-end comp.; data storage & management |  
Platforms for open access, data sharing, collaboration

**Climate System Elements**

**Function: Enduring capability and Link to science communities**

Water, Energy, Composition, Dynamics, (Biosphere)  
Ocean, Atmosphere, Cryosphere, Land

**Regional and Global**

[Partnerships] Links to sustained observing systems (e.g. GCOS)

[Partnerships] Coordinated Model Experiments and Assessments | Production | Evaluation

# Implementation Plan: Draft Structure

1. Introduction
2. The WCRP Strategy: Vision, Mission and Objectives
3. Engagement
4. 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: Gantt chart, milestones, deliverables
7. Measures of success
8. Risks and contingencies

## Phase I (by May 2020)

## Phase II (by May 2022)

Fully consultative development  
Will include:

- Support functions (including support offices)
- External governance: sponsors, Joint Scientific Committee, Governing Board, Joint Planning Staff (Secretariat)
- Internal structure and governance
- Resources, budgets, finance management



# Implementation Plan: Roadmap

## Before the end of 2019:

- Task Teams on Regional Activities, Modelling and Data
- Interaction with Future Earth: Landscape discussion
- Interaction with WWRP/GAW and other partners
- Meeting with WCRP Sponsors

## Early 2020:

- WCRP High-level Science Questions and Flagship Workshop: February 2020
- WCRP Elements and Structure Workshop: March/April 2020

# Implementation Plan: Roadmap

## May/June 2020:

### JSC-41: Approval of WCRP Implementation Plan:

- High-level science questions and flagship product
- Elements of the new WCRP
- Collaboration landscape and interfaces to partners
- Governance
- Financial plan

## After JSC-41:

- Request from Sponsors for approval of plan
- Writing of WCRP Implementation Plan
- Community and agency outreach, including fundraising

### Initial planning and conceptualizing

Implementation and Transition Meeting and 40th Session of the Joint Scientific Committee (JSC-40)

May 2019

- Request from Sponsors for approval of plan
- Writing of WCRP Implementation Plan
- Community and agency outreach, including fundraising

### Consolidation:

- Landscape discussion
- Partner and stakeholder consultation
- Funder and sponsor consolidation

Set up WCRP Task Teams on modelling, data and regional activities

AGU: Community consultation of WCRP Framework  
December 2019

### Phase I: Approval of WCRP Implementation Plan:

- High-level science questions and flagship product
- Elements of new WCRP
- Collaboration landscape and interfaces to partners
- Governance
- Financial plan

JSC-41

May 2020

“Elements and Structure”  
Workshop:  
March/April 2020

“High-level Science Questions and Flag Ship”  
Workshop  
February/  
March 2020

### Phase II and beginning of transition

(JSC-42)

April 2021

Synthesis of core activities

Transition

Agreement on final Implementation Plan (JSC-43)

April 2022



**Thank You**



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