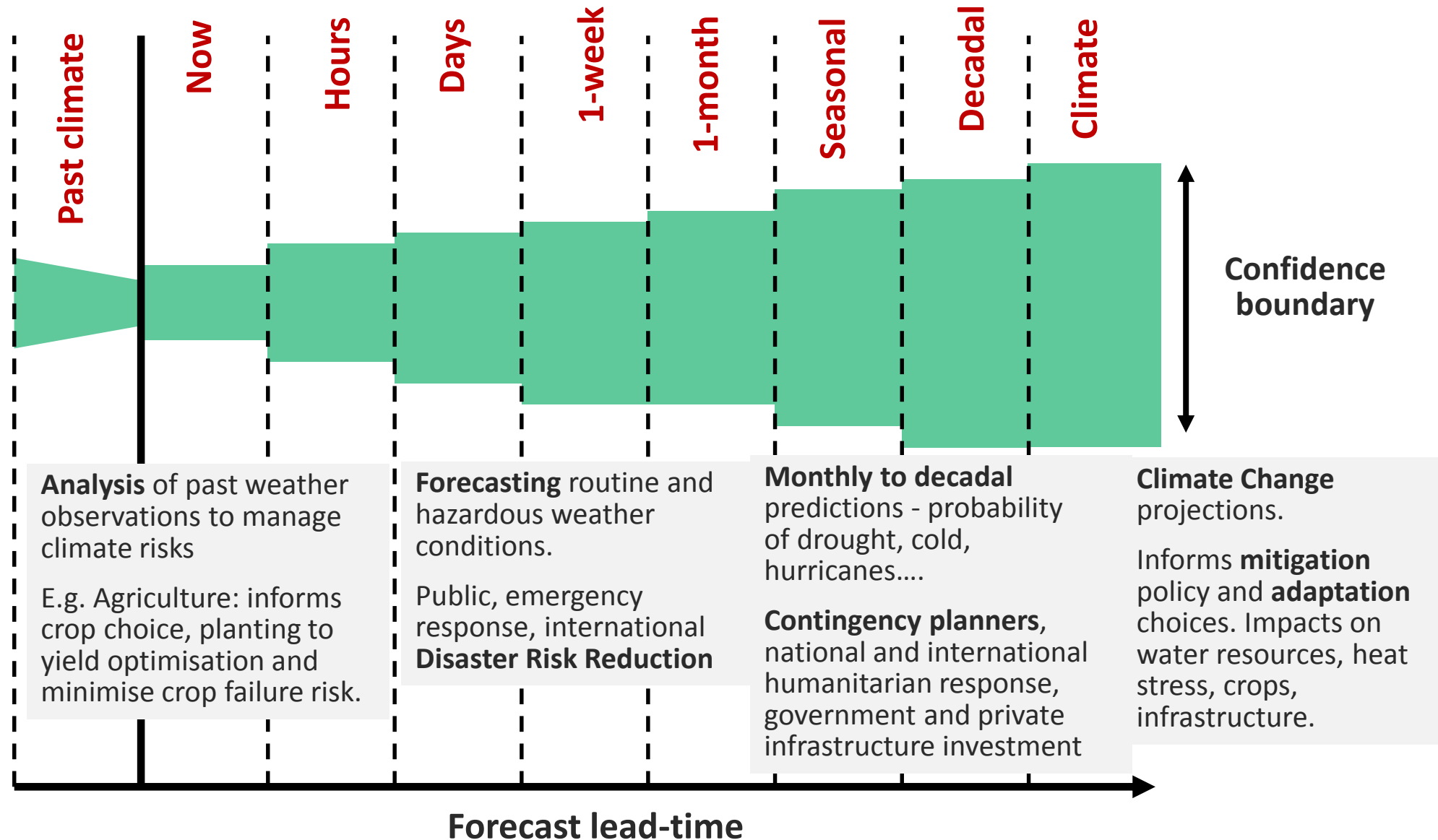


# WORLD CLIMATE RESEARCH PROGRAMME (WCRP)

**OUTLOOK** (as a part of new WMO integrated science to services strategy)

# New Tools in the Toolbox: Seamless Prediction Across Timescales



# **(Expected) outputs from ongoing activities (1)**

- **Coupled Model Inter-comparison Project Phase 6 (CMIP6) as a critical foundation of the IPCC Assessment(s)**
  - First data set released in August 2018
  - Foundation for climate change scenarios at regional and national/local levels
- **Regional and Urban Climate Scenarios and Climate Knowledge Production ( CORDEX)**
  - high resolution (20km) climate data for all major land regions of the world
  - CORDEX Africa Impact Atlas
  - Global Research and Agenda on Cities and Climate Change Science (together with The Cities Alliance, C-40 Cities Leadership Group and many others)

# (Expected) outputs from ongoing activities (2)

- **Earth's Energy Imbalance project (EEI)**

- Fundamental metrics and the basis of various climate indicators
- Estimated over the past decade, helping in assessing gaps in the global climate observing system, and in performance of climate and Earth system models

- **Global and Regional Sea Level Rise and it's Components**

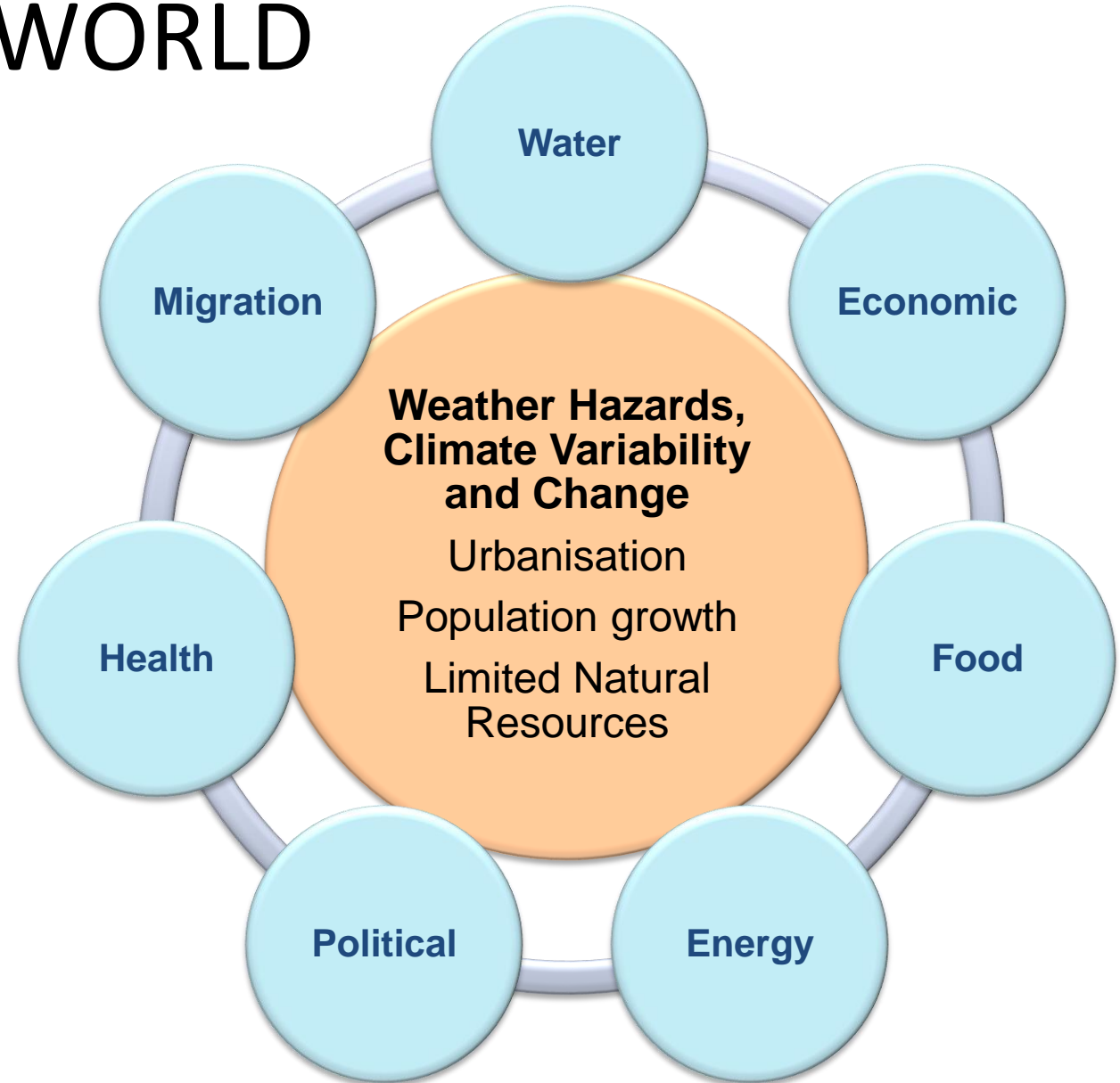
- since 1993 (start of altimetry)  
1993-2018 → 3.15 +/- 0.1 mm/yr

2014-2018 → 4.5 +/- 0.3 mm/yr

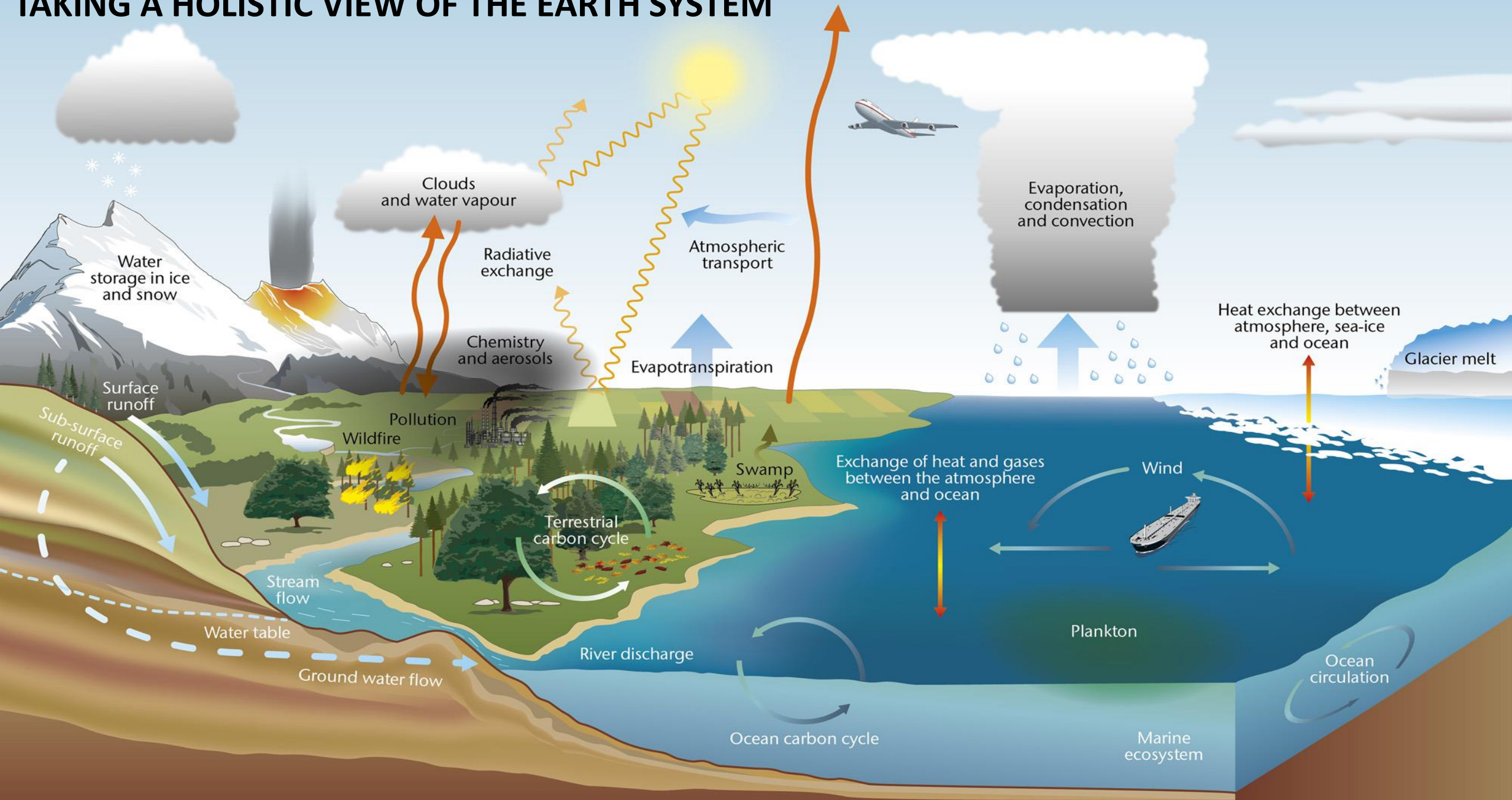
2014-2017 → 5.1 +/- 0.3 mm/yr

# 21<sup>st</sup> 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.



# TAKING A HOLISTIC VIEW OF THE EARTH SYSTEM



# WCRP CAPABILITY THEMES

**EARTH SYSTEM  
PROCESSES ACROSS  
SCALES**

*Jointly with WWRP*

**CLIMATE VARIABILITY,  
PREDICTABILITY &  
PREDICTION**

**CLIMATE CHANGE AND  
EARTH SYSTEM  
FEEDBACKS**

*Jointly with AIMES*

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

**WCRP WORKING GROUP ON CLIMATE MODEL DEVELOPMENT**

*jointly with WGNE*

**WCRP WORKING GROUP ON CLIMATE INFORMATION FOR REGIONS**

*linking with Future Earth*

**WMO/IOC**

**GLOBAL CLIMATE  
OBSERVATIONS,  
ANALYSES &  
MONITORING**

*(CCI, GCOS...)*

**WMO/ICSU**

**GLOBAL  
ATMOSPHERIC  
COMPOSITION**

GHG Monitoring;  
Air Quality  
Prediction;  
Atmospheric  
Chemistry  
Processes &  
Modelling

*(GAW,  
SPARC,IGAC)*

**CLIMATE CHANGE ASSESSMENTS AND CLIMATE SERVICES (UNFCCC, IPCC, GFCS, Copernicus, VIACS, .....)**

# 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

**WCRP WORKING GROUP ON CLIMATE MODEL DEVELOPMENT** *jointly with WGNE*

## WCRP WORKING GROUP ON CLIMATE INFORMATION FOR REGIONS

*linking with Future Earth*

Regional downscaling methods; Application-inspired Climate Science; Transdisciplinary Engagement



# **Near Term Plans (WMO Coordinated, in partnerships)**

- **Fast Track (holistic) Climate Attribution Project**
- **More regular (annual?) Climate Science Updates**
- **Regionally Focused Science for Service Activities**
- **“Defragmentation” of Climate Science and Climate Monitoring Efforts**