







#### **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** 





JOINT PLANNING STAFF (JPS)

**REGIONAL CLIMATE DOWNSCALING** 

#### **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

### **CURRENT WCRP STRUCTURE**

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** 



## **ICSU-WMO-IOC Review recommendations** (partial)

#### **EARTH SYSTEM PROCESSES ACROSS SCALES**

Jointly with WWRP

Energy, Water and Carbon Cycles; Fundamental Atmospheric Physics (e.g. Convection); Land-Atmosphere Coupling; 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 Strategic Plan 2019-2029

(Draft)

#### Fundamental understanding of the climate system

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.

Prediction of the near-term evolution of the climate system

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

Future evolution of the climate system

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

Bridging climate science and society

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

#### The GEWEX Approach is

An integrated approach to quantify links between energy & water and critical Earth System feedbacks that result. The approach involves:

- Stewardship of observations, observing system assessment & definition
- Advance process understanding fundamental to hydrological & hydrometeorological apps and to climate change
- Promote improvement in global, regional and process level modeling, in obs analysis and observing system definition





### WCRP CAPABILITY THEMES

WMO/IOC

GLOBAL CLIMATE OBSERVATIONS, ANALYSES & MONITORING

(CCI, GCOS...)

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/ICSU

GLOBAL ATMOSPHERIC COMPOSITION

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

(GAW, SPARC,IGAC)

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



## Two Big Science Questions that motivate GEWEX & we are encroaching more & more onto a third

- ☐ Where does the heat go?
- ☐ How is the fresh water on the planet changing?
  - **☐** Where does the carbon go?

3 fundamental 'reservoir' questions





## Two Big Science Questions that motivate GEWEX & we are encroaching more & more onto a third

☐ Where does the heat go?
 ☐ How is the fresh water on the planet changing?
 ☐ Where does the carbon go?
 ☐ How does the weather change with climate?
 ☐ How does climate influence the habitability of the
 ☐ The state of the control of the planet changing?
 ☐ Seamlessness, basic weather system research and Earth system predictability and prediction all intimately tied to

from 'Climate research must sharpen its view'

circulation

Earth and its regions?





## **WMO New Strategy**

- Effectiveness and efficiency
- Seamless integrated approach (spatial, temporal):
  - Earth System approach
  - WMO acting as one
- Wider engagement of Members & national experts
- Agility to uptake new challenges and tasks
- Improved collaboration with partners



# Thank You



