WCRP update

WDAC5, Asheville, 7-8 April 2016

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Mission & Objectives

World Climate Research Programme supports climate-related decision making and adaptation planning by coordinating research required to improve

(1) climate predictions and
(2) understanding of human influence on climate

“for use in an increasing range of practical applications of direct relevance, benefit and value to society”

The big picture

- UNFCCC: Paris agreement, 1.5 degC aim
  - SBSTA: IG3IS
- GFCS: research, modeling and prediction
- Sendai Framework on Disaster Risk Reduction
- Expected new UN Urban Agenda
- IPCC: AR6, ocean, regional, 1.5 degC, urban
Joint Scientific Committee

Modeling Advisory Council

Working Groups on: Coupled Modeling (WGCM), Numerical Experiment (WGNE), Regional Climate (WGRC), Seasonal to Interannual Prediction (WGSIP)

CLiC

CLIVAR

GEWEX

SPARC

CORDEX

Regional Sea-Level Change and Coastal Impacts

Cryosphere-Climate

Ocean-Atmosphere

Land-Atmosphere

Troposphere-Stratosphere

Regional Climate Downscaling

Melting Ice and Global Consequences

Changes in Water Availability

Cloud Circulation and Climate Sensitivity

Understanding and Predicting Weather and Climate Extremes
WCRP vision for a data infrastructure: 
Earth System Grid Federation

Observations $+\varepsilon$

Reanalyses $+\varepsilon$

Simulations $+\varepsilon$
What’s next?
“The elephant in the room” (A. Ratier)

- Risk management and decision making
- Propagation along the supply chain
- Need for traceability and ref observations
- Capturing uncertainties
- Error covariances
- Capturing new skill (reanalyses, sub-seasonal to decadal forecasts)
- How good is good enough? Moments? PDF?
1. Atmospheric cloud radiative effects (CERES-like, for sfc radiation budget and vertical profiles of radiative cooling)

2. Highly-vertically resolved water vapor in LT (sharp gradients bw/ PBL and free troposphere)

3. Better estimates of cloud water path (separation of clouds and precipitation)

4. Vertical structure of latent heating, including surface evaporation (esp. below clouds for feedback studies)

5. Large-scale vertical velocity / convergence (esp. for mean circulation, tropics, MJO, prospects w/ ADM-Aeolus)

6. Support for a more continuous culture of complementary field experiments

(see details in S. Bony, GCOS conference 2016)
- **Vertical profiles** of many **atmospheric constituents** from UT to MS with **global coverage**
- **Stratospheric composition and circulation**
- **Problem:** gap expected in ozone and other trace species and aerosol measurements after current satellites fail
Integrated Global Greenhouse Gas Information System (IG3IS)

Satellites

TCCON

China

Earth Networks

Brazil

Current Network

“Carbon Weather”
Next challenges

- Data set assessments: uncertainty
- obs4MIPs and ESGF: relaxing CMIP5, in-situ
- Fluxes: preparing for the model after next
- Reanalysis: towards coupling and ESM, ‘reanaMIP’
- Possible WCRP-GCOS Data Prize: 2016 start
- Open data policy: review and finalization
- Next WCRP strategic plan: WDAC vision and input
Some upcoming events

- ICRC CORDEX Conference, Stockholm, 16-20 May 2016
- CLIVAR Open Science Conference, Qingdao, China, 18-25 September 2016
- S2D Conference, Spring 2017, TBD
- WGNE systematic error workshop, Montreal, 19-23 June 2017
- International conference on reanalysis, UK?, fall 2017
Polar Challenge

Be the first to complete a 2000 km continuous mission with an Autonomous Underwater Vehicle (AUV) under the sea ice.

Prize Money Award
500,000 CHF

Compete for the Prize!
Become a co-sponsor!
www.wcrp-climate.org/polarchallenge

Context
The cryosphere plays a fundamental role in the climate system. We need much better monitoring and prediction capabilities for the polar regions.

Opportunities
We can expand our capabilities to operate

Vision
A cost-effective, sustainable and autonomous polar ocean monitoring system to drive a new era for climate research and services.
THE POLAR CHALLENGE
Many thanks to

NCEI,

CICS-NC,

Otis and colleagues!