



## WCRP update

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WGSIP15, Hamburg, 24-26 September 2012

**WCRP**

World Climate Research Programme



ICSU

International Council for Science

# Mission & Objectives



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

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

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

*(WCRP Strategic Framework 2005-2015).*

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## The Interdisciplinary Nature of Climate Science

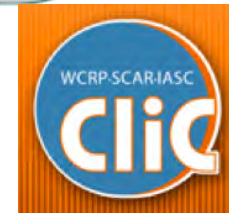
- Atmosphere, Oceans and Climate
- Cryosphere and Climate
- Atmospheric Chemistry and Dynamics
- Water, Energy and Climate



## Meeting the Information Needs of Society

### Activities in Support of Key Deliverables

- Decadal Variability, Predictability and Prediction
- Sea-Level Variability and Change
- Climate Extremes
- Atmospheric Chemistry and Dynamics
- Centennial Climate Change Projections
- Seasonal Climate Prediction
- Regional Climate



## Activities in Support of WCRP Integrating Themes

- Climate-Quality Data Sets and Analyses
- A New Generation of Climate/Earth System Models
- Next Generation of Climate Experts: Developing Capacity Regionally and Globally

WCRP  
IMPLEMENTATION  
PLAN 2010-2015

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# Future Directions: Actionable Science

**Defined as: data, analysis, and forecasts that are sufficiently predictive, accepted and understandable to support decision-making, including capital investment decision-making.**



World Climate Conference-3, OceanObs '09, ICSU Review and Visioning, Open Science Conference, acknowledging WCRP past contributions and identifying future challenges and opportunities.



Need for more flexibility/agility to respond to expanding users needs, that includes information:

- At regional scale
- For key sectors of global economy
- For adaptation, mitigation and risk management

# WCRP

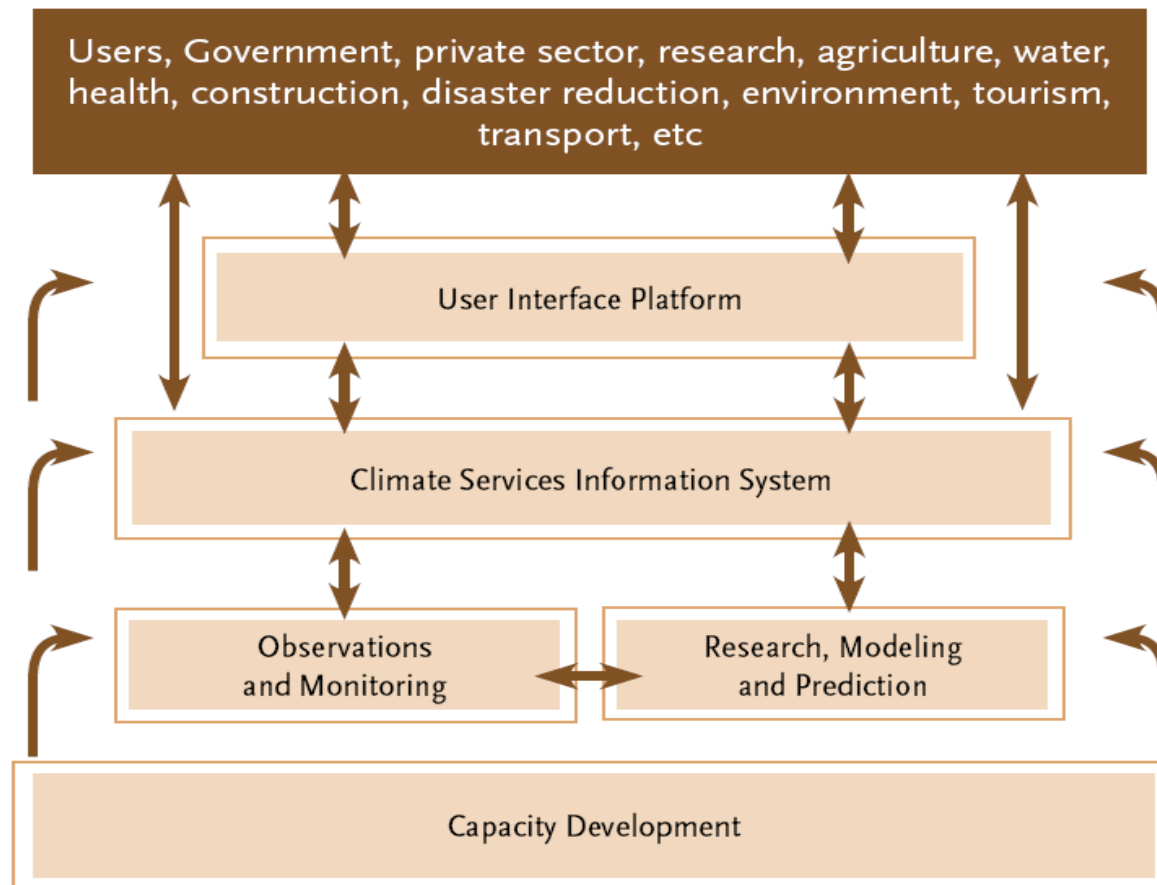
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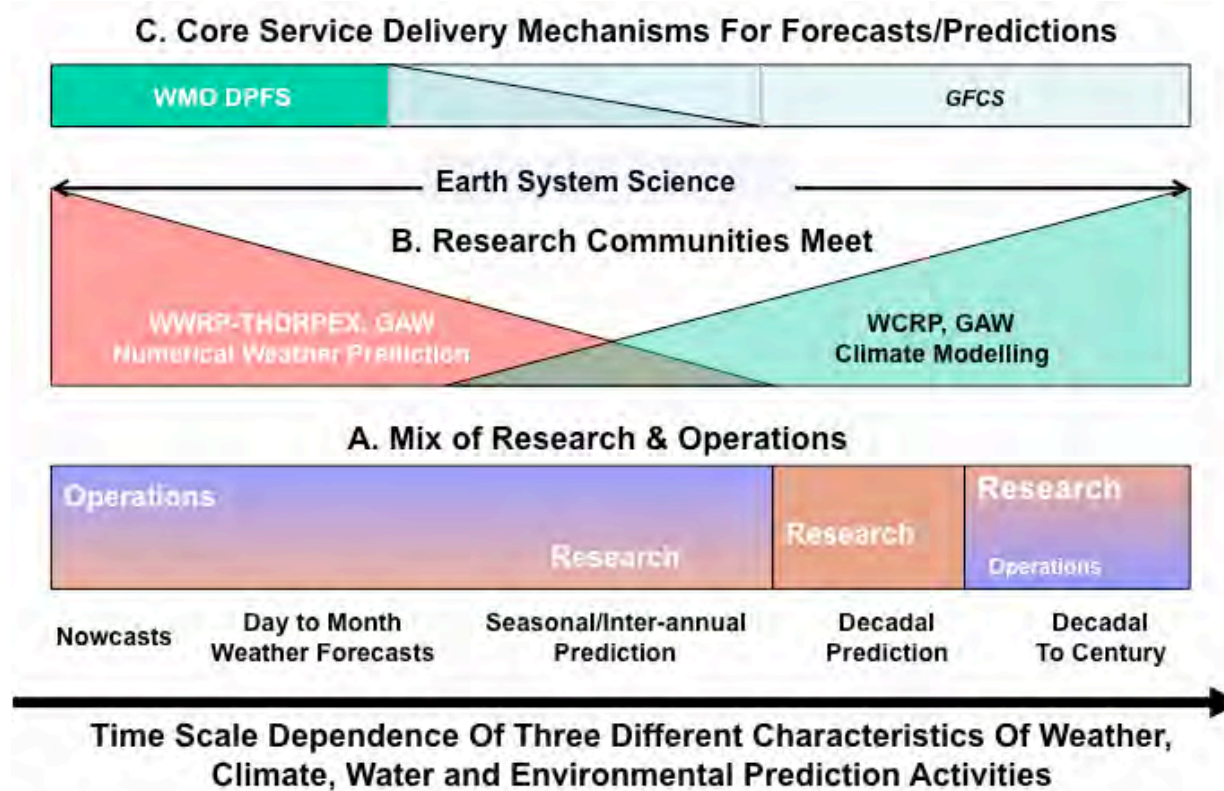
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## Global Framework for Climate Services (GFCS)







Increased WWRP-WCRP collaboration between weather and climate communities:

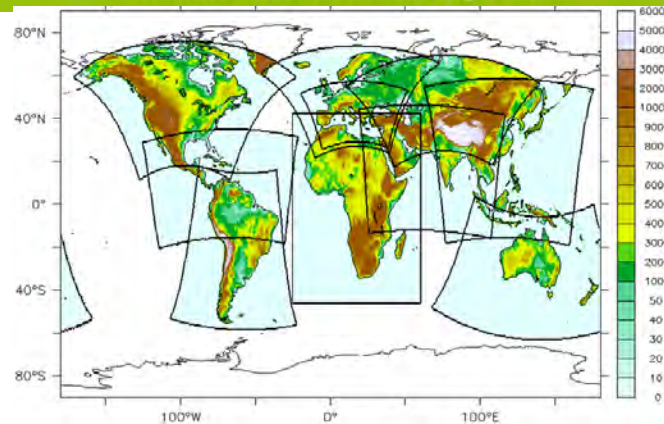
- Subseasonal to Seasonal Prediction initiative
- Polar Prediction Project
- THORPEX post 2014: some plans under discussions



## WCRP Grand Challenges

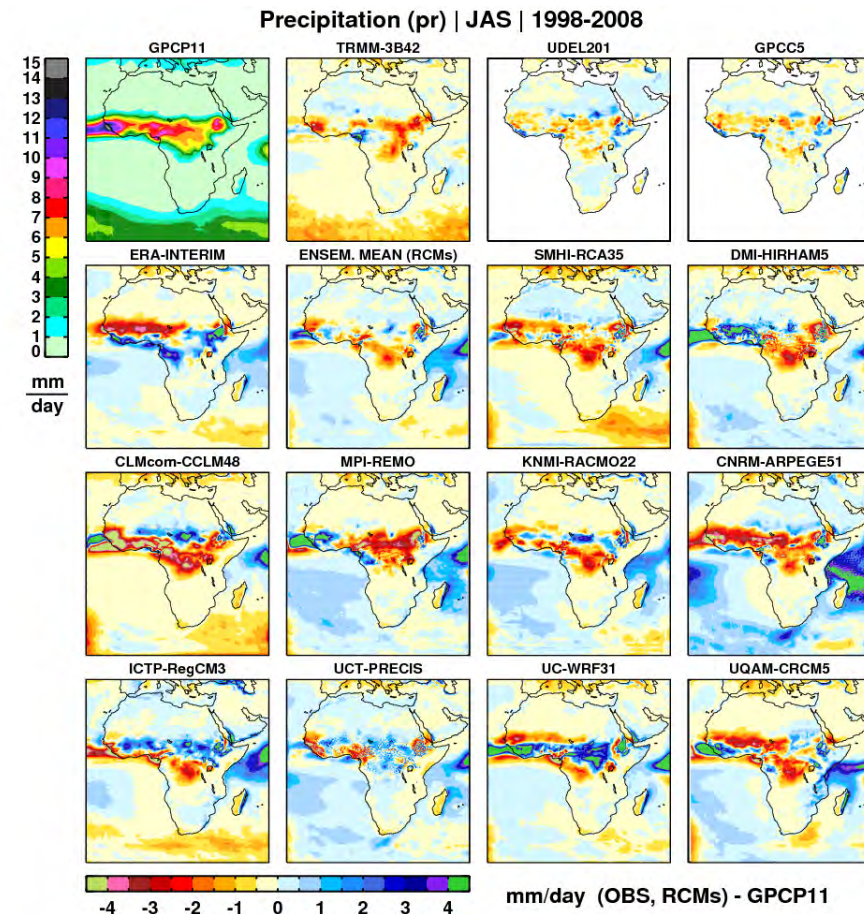
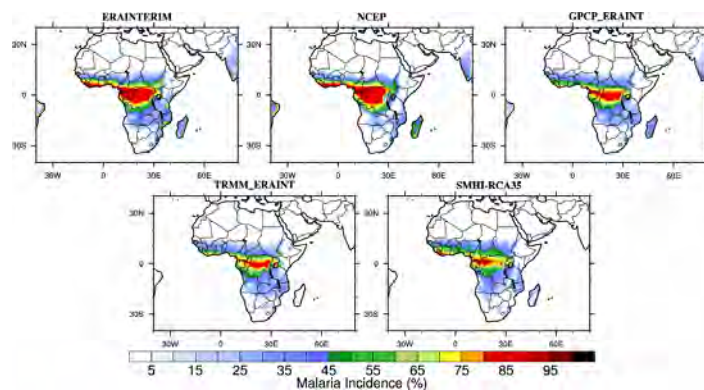
- **Skilful regional climate information (mainly CLIVAR lead)**
- **Regional Sea-Level (CLIVAR lead, with CliC and GEWEX)**
- **Cryosphere in a changing climate (CliC lead)**
- **Cloud and Climate Sensitivity (WGCM lead, with GEWEX and SPARC)**
- **Changes in water availability (GEWEX lead)**
- **Prediction and attribution of extreme events (GEWEX lead)**

## Coordinated Regional Climate Downscaling (CORDEX)



- 12 domains with a resolution of 0.44° (approx. 50x50km<sup>2</sup>), focus on Africa
- High res ~0.11°x0.11° for Europe (by some institutions)

Dynamic Malaria Model driven by climate observations & CORDEX simulations (mean annual prevalence (%))



Example of CORDEX multi-model data available for Africa. From Top to bottom and left to right: GPCP mean July-August-September precipitation for 1998-2008 and differences compared to GPCP in the other gridded observations, and the individual RCMs with their ensemble average.

SMHI (50km<sup>2</sup>) reproduces well the mean annual malaria incidence pattern with respect to TRMM-ERAINT & GPCP-ERAINT control experiment



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## WCRP Organization

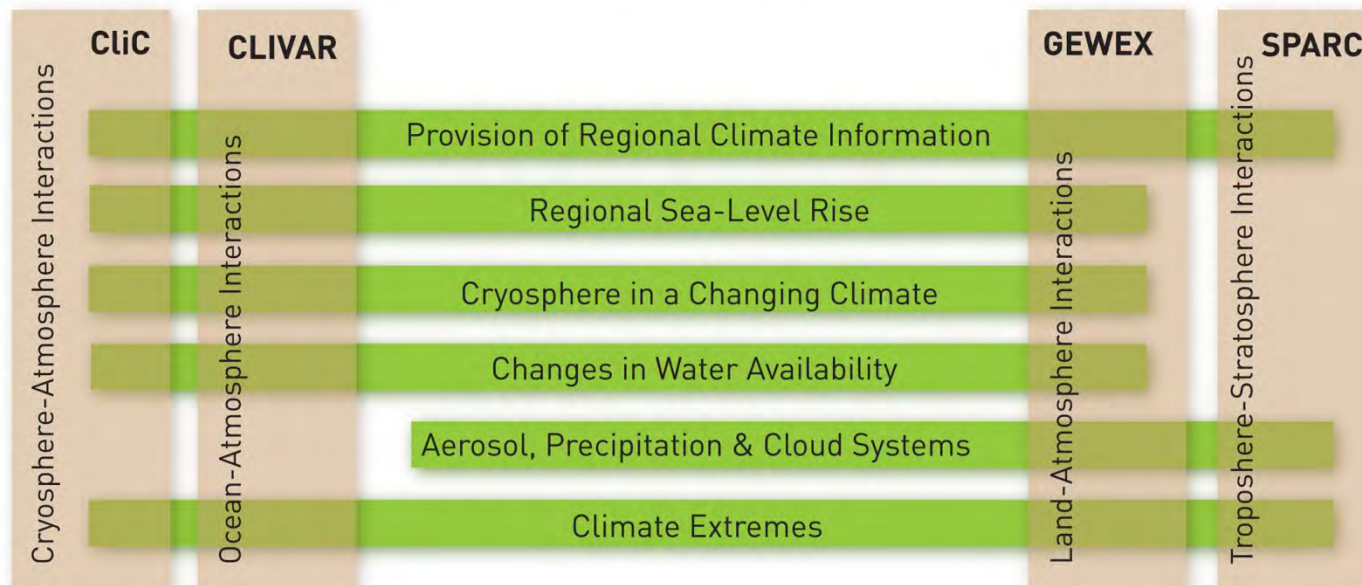
Joint Scientific Committee

Joint Planning Staff

Modeling Advisory Council

Data Advisory Council

**Working Groups on:** Coupled Modelling (WGCM), Regional Climate (WGRC), Seasonal to Interannual Prediction (WGSIP), Numerical Experimentation (WGNE)





### WCRP Open Science Conference: Climate Research in Service to Society 24-28 October 2011, Denver USA



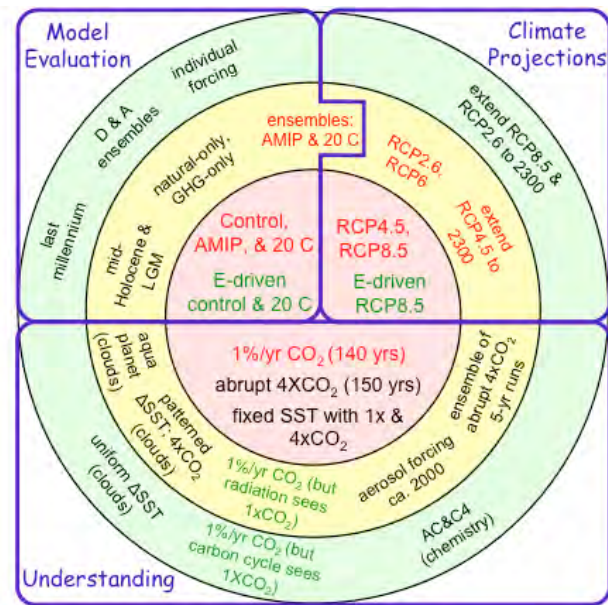
#### Registered Participants:

- 1907 from 86 countries
- 541 Early Career Scientists & Students
- 332 from Developing Countries





A rich set of modeling experiments, drawn from several predecessor MIPs, focuses on model evaluation, projections, and understanding



Red matches CMIP3

experimental suite

Green coupled carbon-cycle

climate models

- Between 15 and 22 AOGCMs, 4 to 8 decadal prediction simulation sets, about 6 high-top models, and 3 to 8 ESMs
- Considerable interest and excitement in analyzing model data to learn new things about the climate system
- Spread of projections in CMIP5 AOGCMs comparable to CMIP3, most first generation ESMs are well-behaved and produce comparable first order results to AOGCMs, but with all their additional capabilities
- Many studies contributing to the next IPCC AR5 report



# WCRP 4<sup>th</sup> International Reanalysis Conference

**7-11 May 2012**

**Silver Spring,  
Maryland USA**

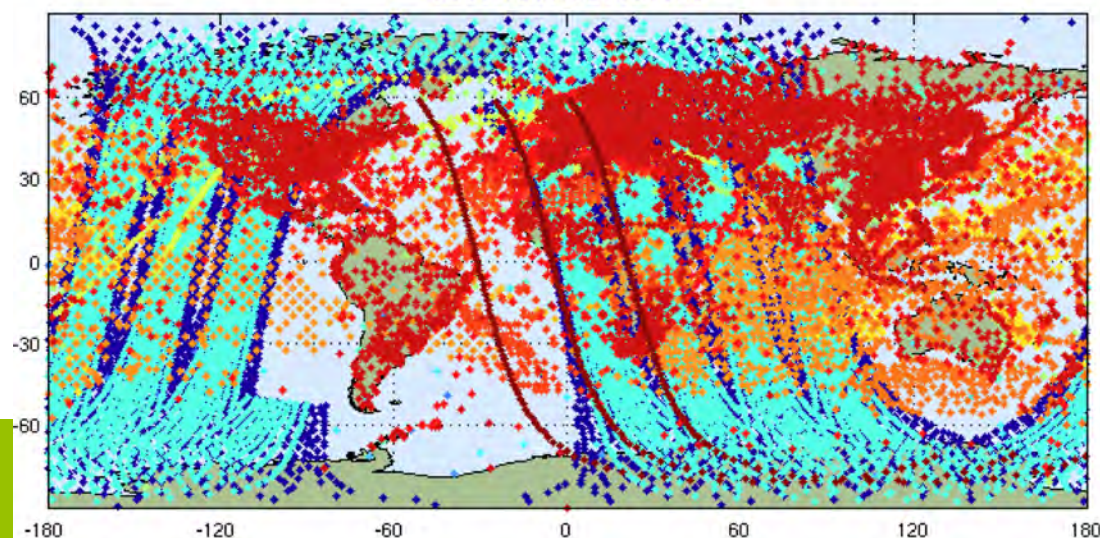
**270+ participants**

**42 countries**



Agency Priorities: An Open Panel Discussion with Conference Participants

Observation Locations



As many as four million observations are analyzed during 6-hours windows in the 2000s. More than 50 billion observations can be analyzed over 30 years (Courtesy of M. Bosilovich)



## WDAC: Obs4MIPs

- Background: WDAC was briefed on the ongoing initiative Obs4MIPs, which makes observing datasets available in an ESGF accessible format.
- Recommendation: WDAC encourages broadening of contributions from the WCRP core projects, CEOS, CGMS, IGBP, SOLAS and the Reanalysis community to this activity, so as to populate the ESGF and further facilitate model-data comparisons

# WDAC: Next meeting

- Venue TBD, likely in April/May 2013
- Suggested topics:
  1. Briefing on Obs4MIPs
  2. Workshop on observations for reanalysis
  3. CEOS and GOSIC to brief on ECV inventories including maturity matrix approach
  4. Four core projects to brief on their best data assessment practices in guiding users to specific data sets
  5. SCOPE-CM presentations on the outcome of phase 1 considering specific ECV data records
  6. Network design, OSSEs
  7. Data needs to initialize models to provide seasonal ice outlooks
  8. Bio-geochemical data brief for Earth system models by IGBP representative
  9. Surface fluxes
  10. ESGF governance – follow-up from various meetings

# WMAC

- Promote model development  
e.g., facilitate sharing of model development experience between groups
- Model evaluation  
e.g., promotion of new diagnostic techniques to link model error to process deficiencies
- Model application  
e.g., assessing and communicating limitations and uncertainties

Approach: Prize, summer schools, on-line forums, dynamical studies

JSC: request to strengthen linkages with IGBP/AIMES

Thank you for your attention!