WCRP
World Climate Research Programme

WCRP Update

Victoria, Canada
1-3 Oct 2013

WMO IOC ICSU

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"

(WCRP Strategic Framework 2005-2015).

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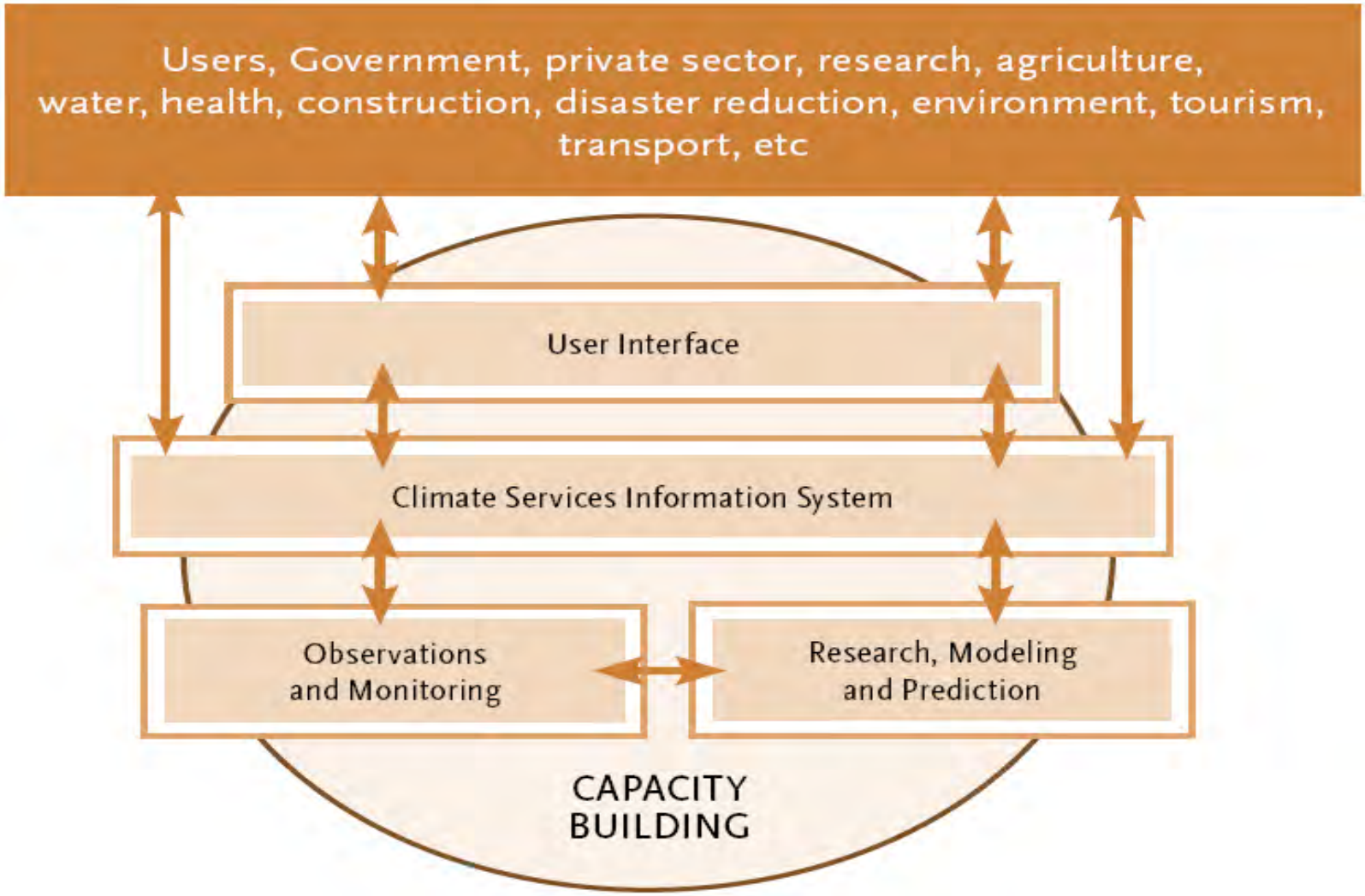
Global Framework for Climate Services (GFCS)



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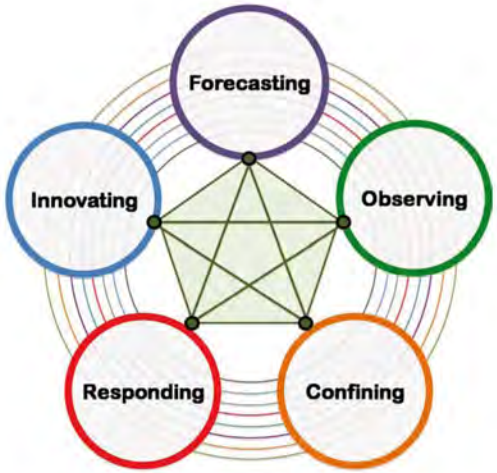
Future Earth: Research for Global Development



Grand Challenges in Earth System Science for Global Sustainability. The concentric circles represent the disciplinary research needed in the social, natural, health and engineering sciences and the humanities that must be carried out alongside interdisciplinary and transdisciplinary research in order to address the challenges. The lines linking the grand challenges show that progress in addressing any challenge will require progress in addressing each of the others.

	Proposed Cross Cutting Capabilities
C1	**Observing Systems**
C2	**Data Systems**
C3	**Earth System Modeling**
C4	**Theory Development**
C5	**Synthesis and Assessments**
C6	**Capacity Development and Education**
C7	**Communication and the Science-Policy Interface**

A global alliance

Launched at RIO+20

WCRP contribution: global & regional climate science and information.

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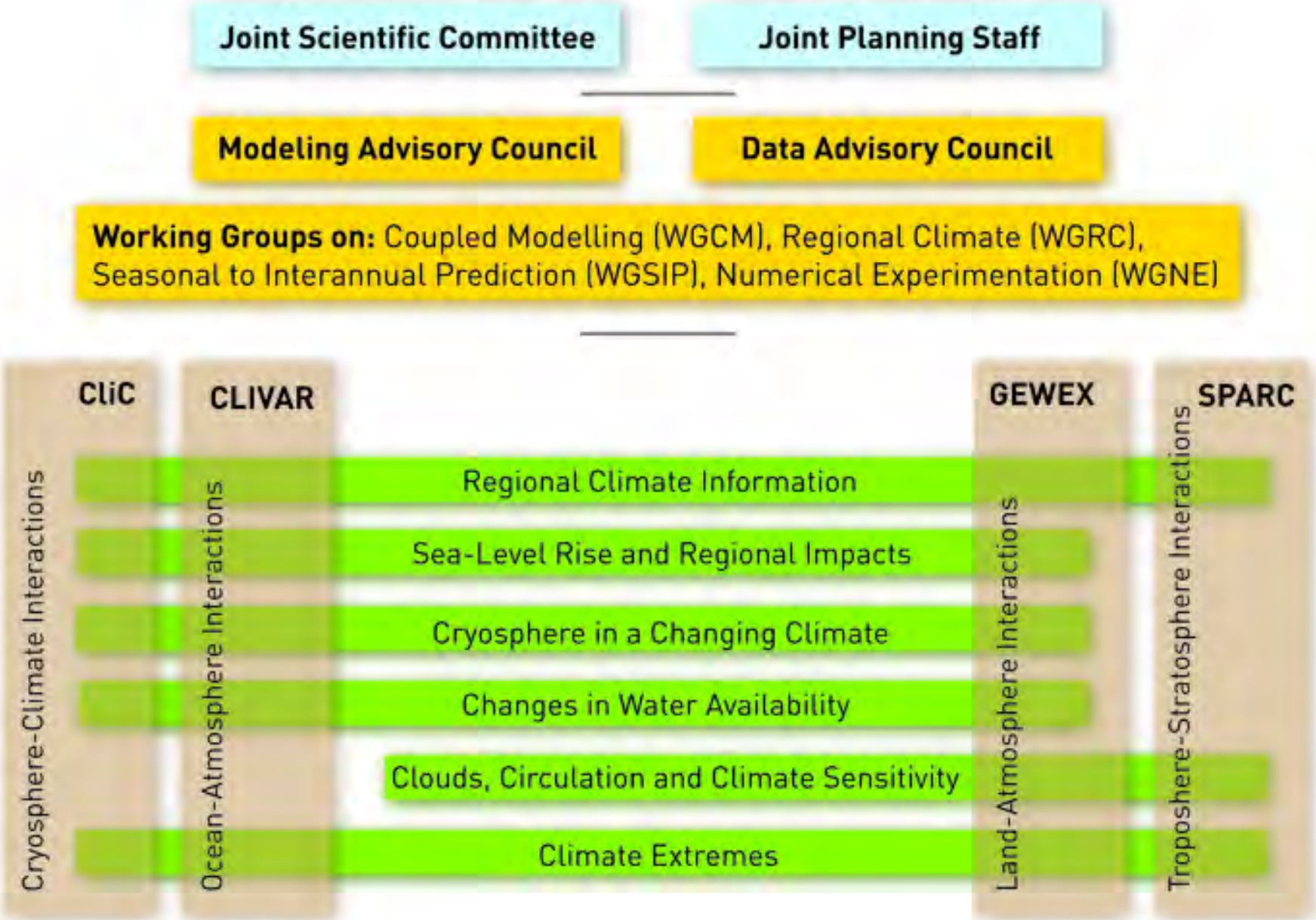
WCRP Organization



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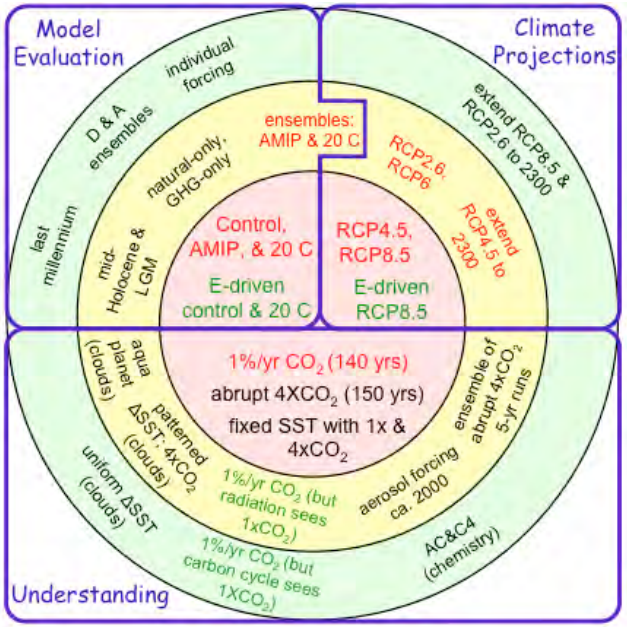
CMIP5
Coupled Model Intercomparison Project

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

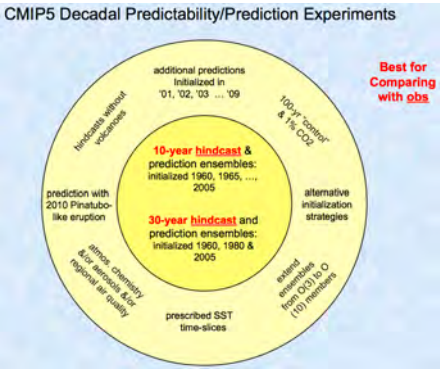


Red matches CMIP3 experimental suite

Green coupled carbon-cycle climate models

- 2+ Petabyte on Earth System Grid Federation
- 59 models, 24 groups
- Many studies contributing to the IPCC AR5 report
- Already 250+ papers

- Other modeling efforts within WCRP (Seasonal-to-internannual, Decadal, Regional-CORDEX) could likely follow similar schemes in the future



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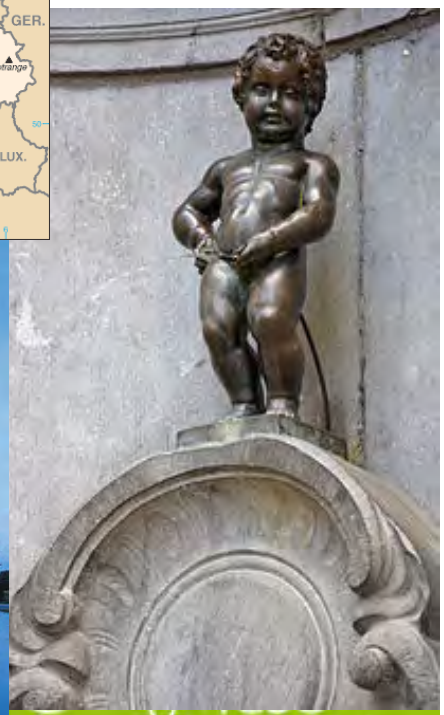
International Conference on Regional Climate - CORDEX 2013

- 4-7 November 2013, Brussels, Belgium
- Partnership between WCRP, IPCC and EC
- Timed between IPCC WGI and WGII releases
- 1st day: High Level Session, Stakeholder dialogue
- 2-4th days: Scientific Conference
- http://cordex2013.wcrp-climate.org/



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ACPC
African Climate Policy Centre

Africa Climate Conference - ACC 2013

Helping to set the priorities for climate research in Africa and putting climate knowledge into the hands of end-users

HEKIMA NI UHURU

Arusha International Conference Centre (AICC)

Tanzania - 15-18 October 2013

UNECA

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The WCRP Conference for Latin America and the Caribbean,
Developing, Linking, and Applying Climate Knowledge

Montevideo, Uruguay on 17-21 March, 2014.

Goals

Identify gaps and ways to overcome limitations in the chain of knowledge going from basic to applied climate science and to informing policy and decisions that are particularly relevant for LA&C.

Build interdisciplinary capacity, fostering the participation of decision and policy makers, climate and social scientists and key intermediary institutions.

Contribute to further develop the emerging provision of regional Climate Services.

WHO IOC ICSU

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THE CLIMATE SYMPOSIUM 2014

Darmstadt, Germany
13-17 October 2014

Climate Research and Earth Observations from Space:

Climate Information for Decision Making

Science and other Committees (Tentative)

Executive Committee

- Ghassem Asrar, WCRP
- Mike Freilich, NASA
- Volker Liebig, ESA
- Alain Ratier, EUMETSAT
- Barbara Ryan, GEO
- Mauro Facchini, European Commission

Science Committee

- Julia Slingo, Chair, Met Office (UK)
- Olivier Boucher, CNRS
- Antonio Busalacchi, ESSIC University of Maryland
- Anny Cazenave, CNES
- Mark Dowell, Joint Research Centre, European Commission
- Erland Kallen, ECMWF
- Terry Nakajima, University of Tokyo
- Zhang Peiqun, China Meteorological Administration
- Roger Sanders, Met Office (UK)
- Byung-Ju Sohn, Seoul National University
- Johannes Schmetz, EUMETSAT
- Björn Stevens, MPI Hamburg

Organizing committee

- Roberta Boscolo, WCRP
- Paul Counet, EUMETSAT
- Rowanna Comerford, EUMETSAT
- Vladimir Ryabinin, WCRP

EUMETSAT WCRP

THE CLIMATE SYMPOSIUM 2014

Supported by the European Commission

www.theclimatesymposium2014.com

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Selected Meetings

- 4th WGNE workshop on systematic errors in weather and climate models - 15-19 April 2013, UK Met Office, Exeter, UK
- International workshop on seasonal to decadal prediction -13-16 May 2013, Meteo France, Toulouse, France
- WMAC2, Brasília, Brazil, 27-28 May 2013
- WCRP JSC34, Brasília, Brazil, 27-31 May 2013
- CFMIP/EUCLIPSE Meeting on Cloud Processes and Climate Feedbacks - 10-14 June, 2013, ZMAW, Hamburg, Germany
- International Summerschool on Clouds and Climate - 24 June - 5 July 5, 2013, Les Houches, France
- CMIP6, 4-9 August, Aspen, CO, USA
- WGCM17, 1-3 Oct 2013, Victoria, Canada
- Cryosphere in a Changing Climate, 16 - 18 Oct 2013 Tromsø, Norway
- WGSIP, 10-12 March 2014, UKMO, Exeter, UK (1 joint day with ET-LRF)
- Clouds, Circulation and Climate Sensitivity, 24-28 March 2014, Germany
- WDAC, 24-25 April 2014, Galway, Ireland
- JSC35 and WMAC3, 30 Jun – 4 Jul 2014, Heidelberg, Germany (1 joint day with WMO CCL)
- Pan GEWEX and CLIVAR meeting, 14-18 July 2014, The Hague, Netherlands

Perspective

- WCRP landscape is changing rapidly
- Services, regional focus
- Need for integration to serve multi-stakeholders/end-users
- Seamless predictions, on time, space and parameter space
- Models: WGNE, S2S, WGSIP, WGCM, CORDEX, AIMES
- Data: ESGF, obs4MIPs, interface to NWPs (e.g. S2S)
- Challenge but also opportunity for CMIP6 and MIPs discussions
- Joint WGCM-AIMES session

Misc

- WGCM contribution to IPCC: inputs sought for WCRP news (nb pubs, authors, activities, etc)
- WGCM17 report: help welcome (e.g. ½ page summary of your brief)
- Many thanks to EC/CCCMA for hosting the meeting (Greg, Deborah) and to PICS' and PCIC support
- A warm welcome to new WGCM members!

Relevant JSC34 actions

- WGCM-AIMES interaction: this meeting
- GC on “Regional Climate Information”:
  - Contributions from WGCM, WGSIP and DCPP
  - CMIP6 process and protocol, experimental design, Aspen meeting, MIPs
  - CORDEX framework and RCM-GCM comparison
- GC on Cryosphere: WGCM interest in sea-ice, land ice and permafrost, CMIP6 science questions, WGCM invited at upcoming Tromsø workshop

Relevant JSC34 actions

- Research on atmospheric dynamics: GC4 on “Clouds, circulation and climate sensitivity” led by WGCM
  - Regional patterns of climate change (Sheperd et al)
  - Model development (Jacob et al)
  - Workshop 24-28 March 2014, Germany
- GFCS implementation: WGCM recommendation for WMAC to coordinate modeling contribution
- Model tuning workshop: WGCM will organize, focus on CMIP models, CMIP6 documentation

Some relevant WMAC2 actions

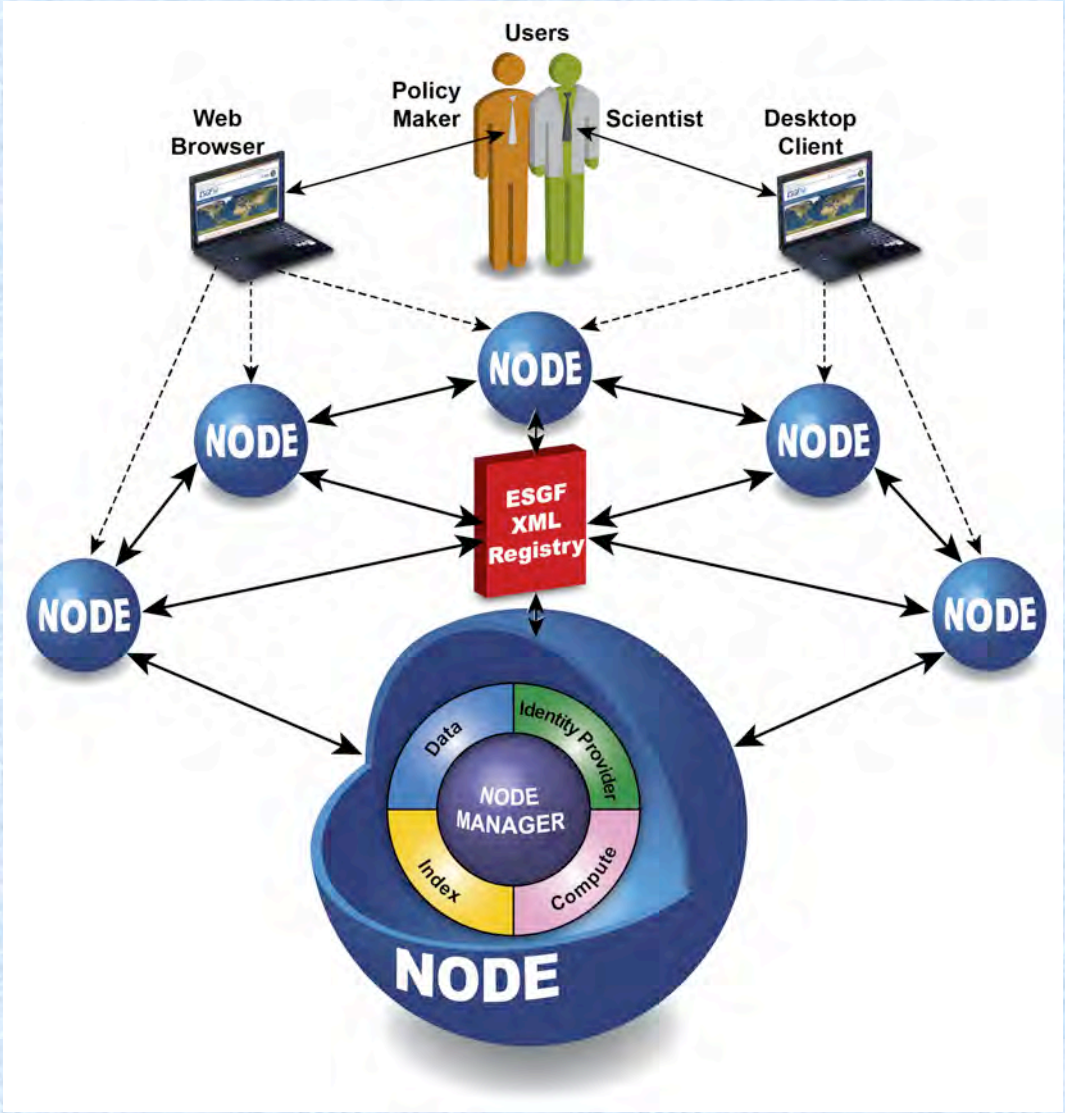
- Model development:
  - summer schools: ECS, model physics, param
  - WCRP/WMO prize with academies
- Systematic errors ws: Transpose CMIP?
- Earth System Grid Federation: main mechanism for exchanging data (mod+obs +reanalyses) in the WCRP in the next decade

Some WDAC2 actions

- Synergies with IGBP on critical climate data: special session on fluxes (SOLAS) at WDAC3, March 2013
- ECV inventory being developed jointly by CEOS, CGMS and WMO (WCRP+ GCOS)
- Doc on best practices to data set assessments (+maturity index) and publications (DOI)
- obs4MIPs Task team to identify suitable data sets for inclusion in ESGF/obs4MIPS and develop guidelines

Thank you very much
for your attention!

Federation connectedness means the user does not have to know where the data resides and critical data is replicated



What are climate models missing?

- "In pursuing the objective to generalize theoretical models we must ask ourselves whether greater detail in formulating the contributing processes is warranted by truncation errors, by sensitivity of the results to detail, by the resulting increase in computational complexity and time, and by ignorance of the way these processes really work. Very often this cannot be determined in advance, but must wait for computational experiments to be performed." (Smagorinsky,1963)
- "Much of what we know, and even more of what we don't know, about Earth's climate and its propensity to change is rooted in the interplay between water, air circulation, and temperature." (Stevens & Bony, 2013)

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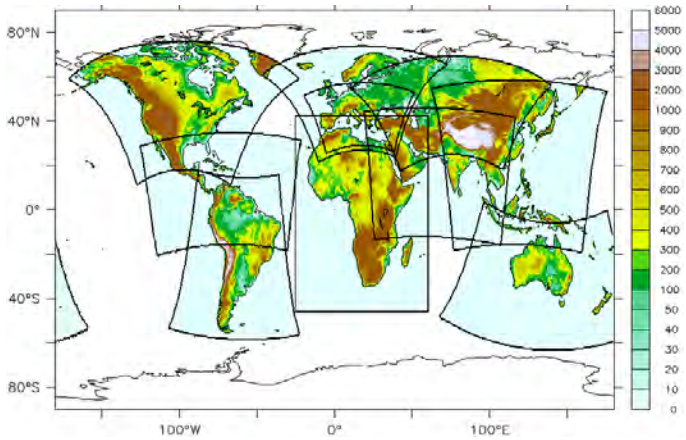
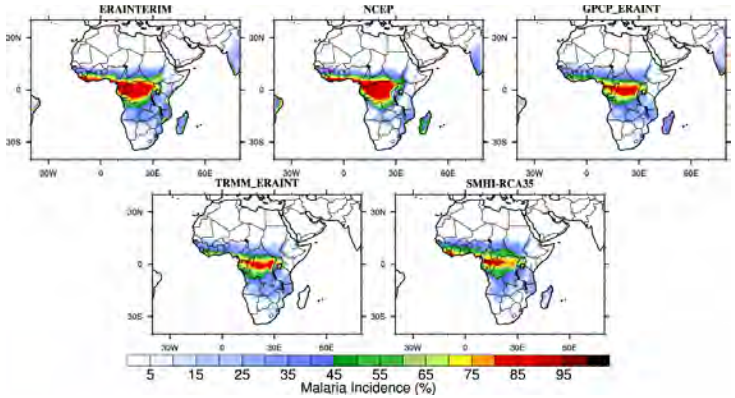
Coordinated Regional Climate Downscaling (CORDEX)

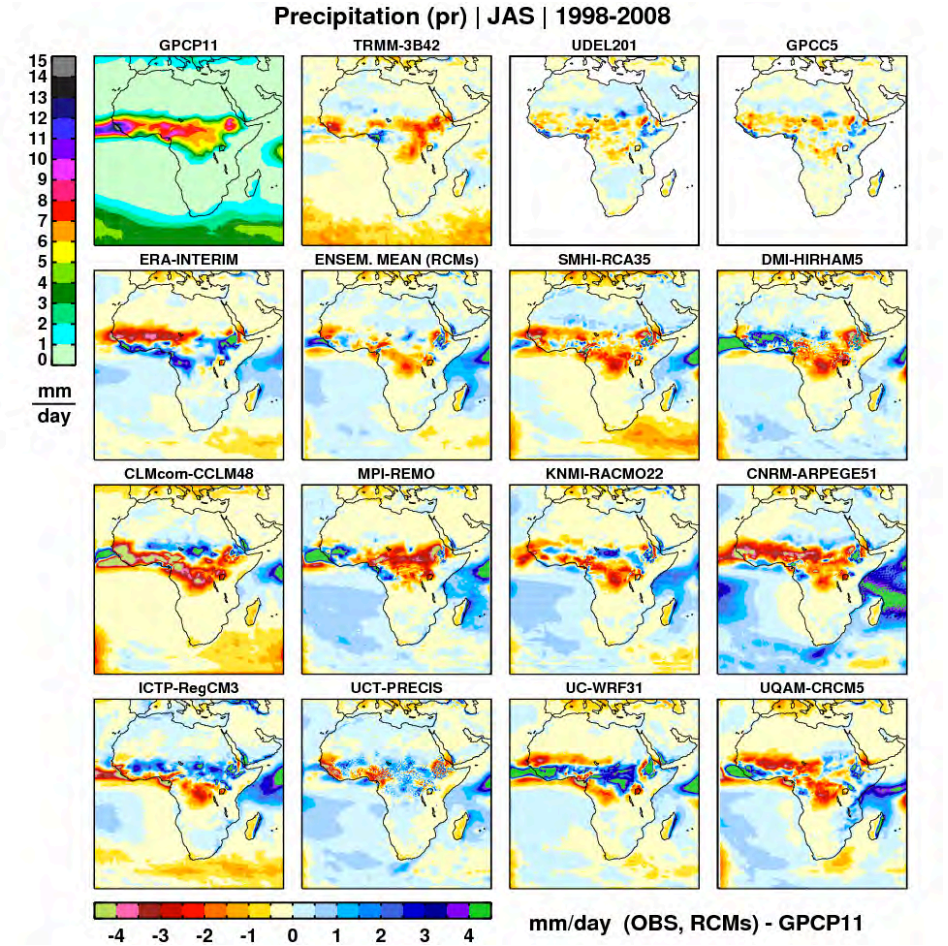


- 13 domains with a resolution of 0.44° (approx. 50x50km²), focus on Africa
- Also higher res for some domains (by some institutions)

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



SMHI (50km²) reproduces well the mean annual malaria incidence pattern with respect to TRMM-ERAINT & GPCP2ERAINT control experiment



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.

Nikulin, G., et al, J. Clim, 2012

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