WCRP
World Climate Research Programme

CORDEX Southeast-Asia Workshop
SEACLID

Jakarta, Indonesia

M. Rixen, WCRP JPS

18-19 Nov 2013

WMO IOC ICSU

Mission & Objectives

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

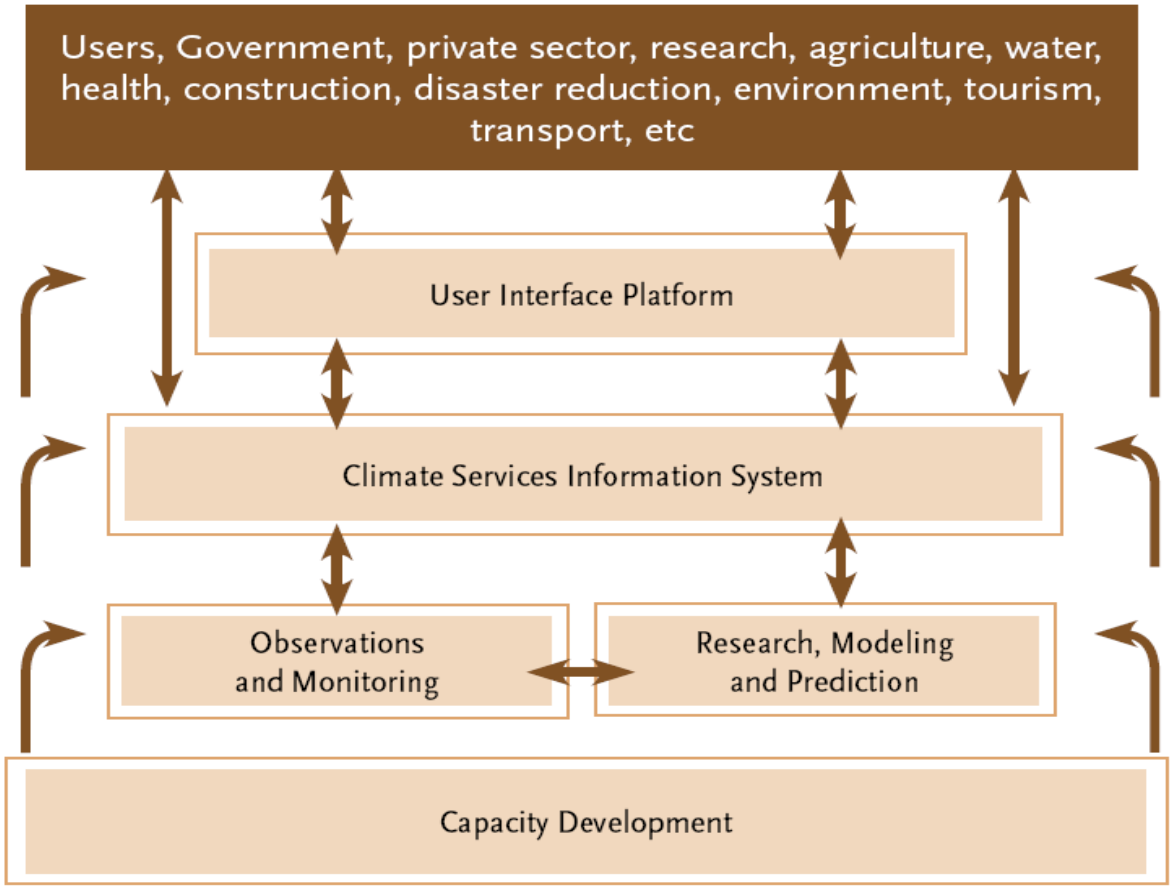
(1) climate predictions and

(2) our understanding of human influence on climate

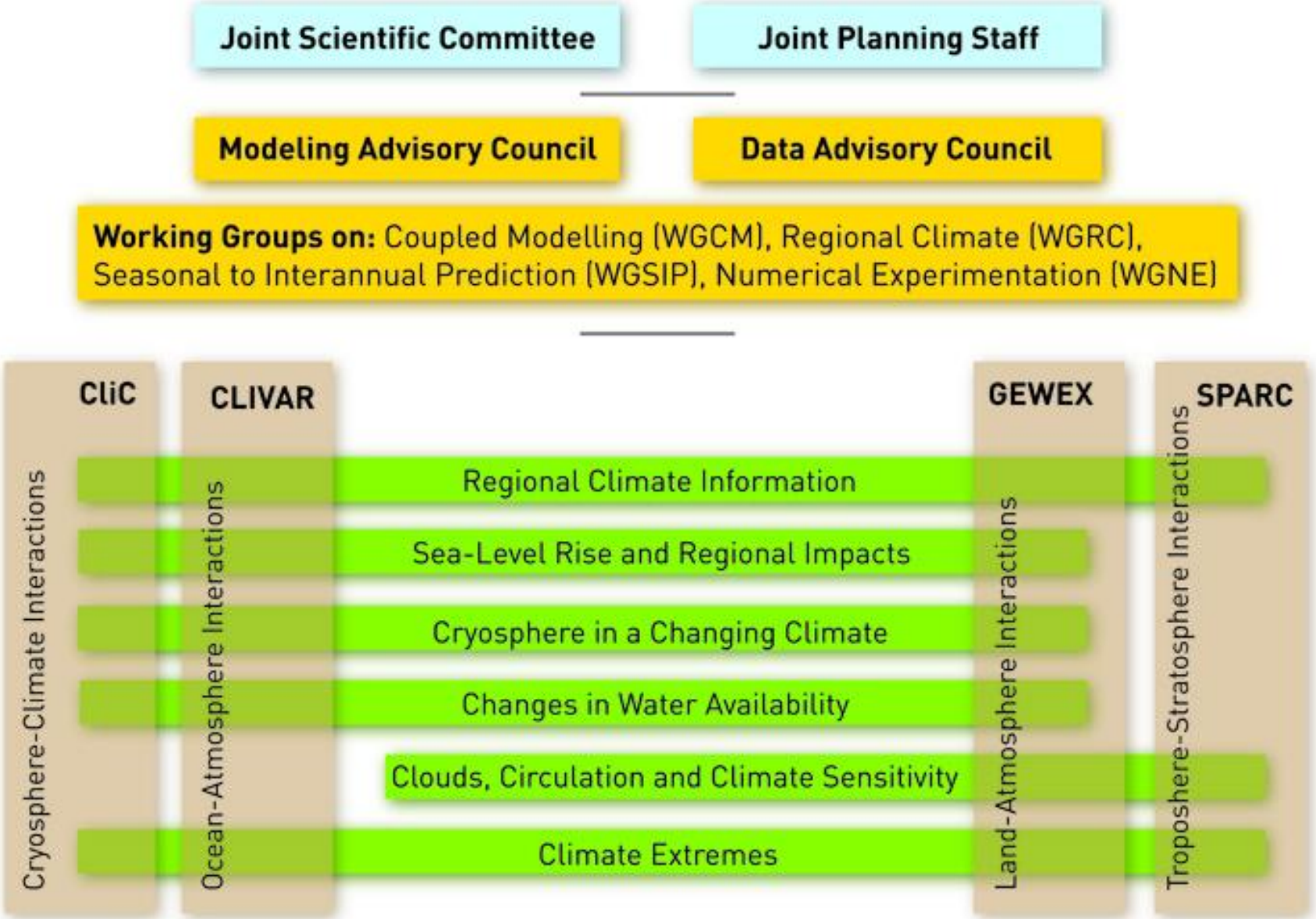
"for use in an increasing range of practical applications of direct relevance, benefit and value to society"

(WCRP Strategic Framework 2005-2015).

Global Framework for Climate Services (GFCS)

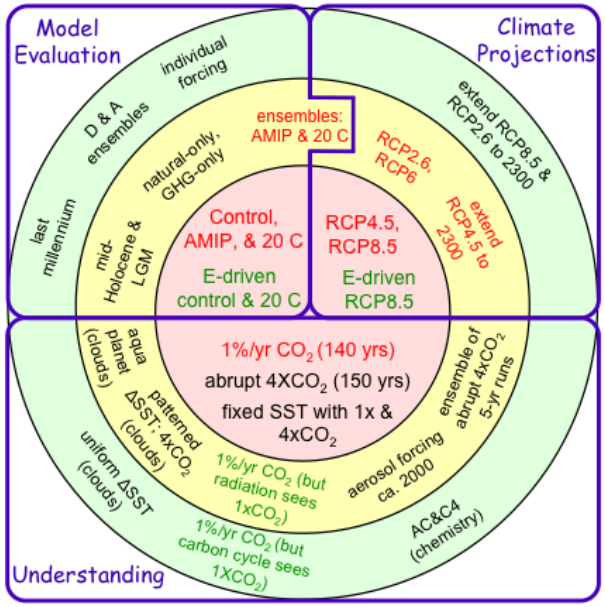


WCRP Organization



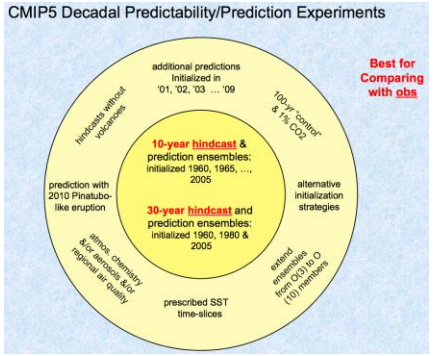
CMIP5
Coupled Model Intercomparison Project

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



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

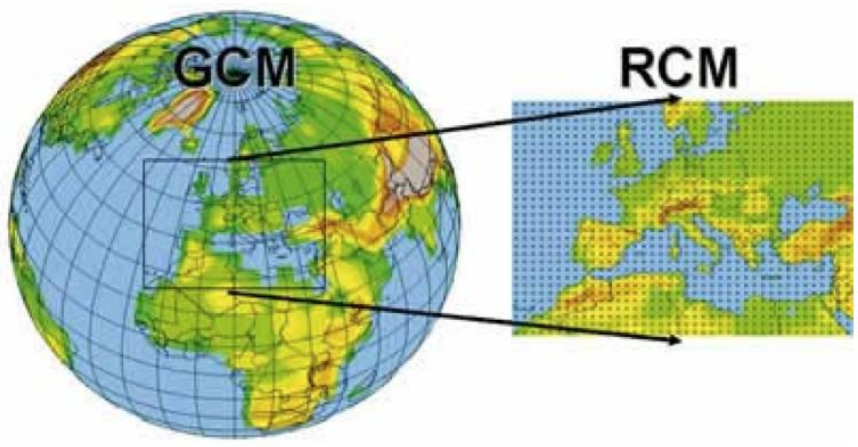
- Other modeling efforts within WCRP (Seasonal-to-internannual, Decadal, Regional-CORDEX) could likely follow similar schemes in the future

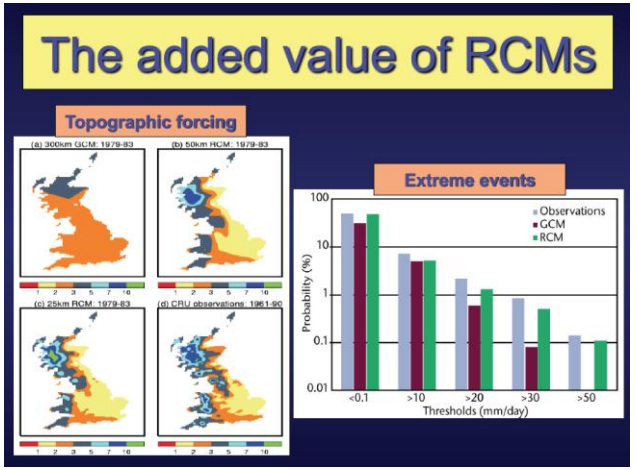


Red matches CMIP3 experimental suite

Green coupled carbon-cycle climate models

From Global to Regional Scale





Why do we need Regional Climate Downscaling Global Climate Models (GCM) can provide us with predictions and projections of how the climate of the earth will change in the future. These results are vital to inciting the international community to take decisions to help limit climate change. However, the **impacts of a changing climate, and the adaptation strategies to deal with them, need to be addressed at a finer, regional scale**. This is where Regional Climate Downscaling (RCD) has an important role to play by providing predictions and projections with much greater detail.

Vision for CORDEX

- Actionable regional information: models and data
- Consistency of CORDEX experiments and protocols
- Recognize regional peculiarities and local ownership
- Past, present, future (predictions and projections)
- Importance of assessments and validations
- Benefits of a multi-model approach to capture uncertainties
- Transfer of uncertainties from models to VIA applications

CORDEX Phase I experiment design

Model Evaluation Framework

Climate Projection Framework

AMIP like

Multiple regions (Initial focus on Africa)
50 km grid spacing

CMIP like

ERA-Interim LBC
1989-2007

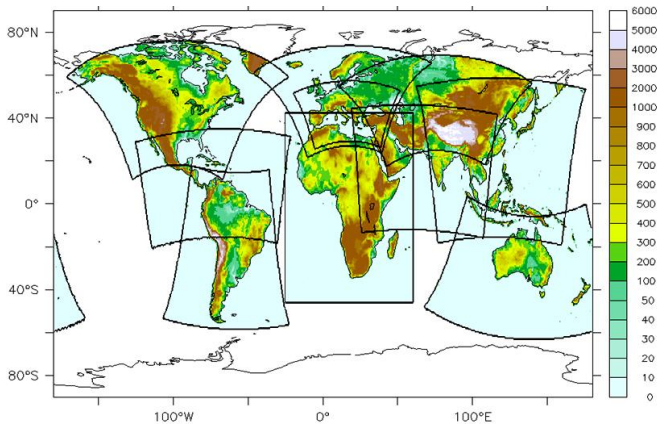
RCP4.5, RCP8.5
1951-2100 or 1980-2050

Decadal predictions
1980-2010, 1990-2000, 2005-2035

Regional Analysis
Regional Databanks

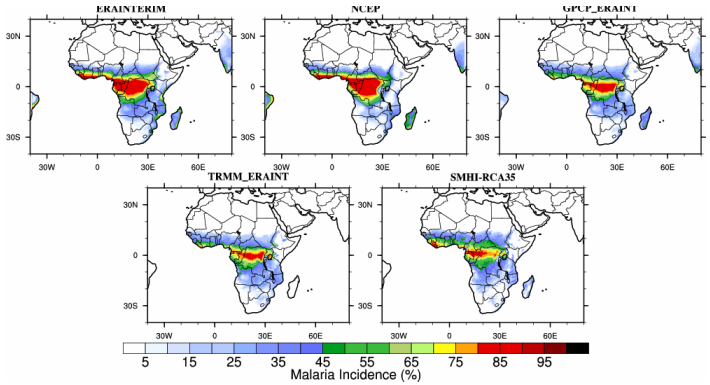
Multiple AOGCMs

Coordinated Regional Climate Downscaling (CORDEX)

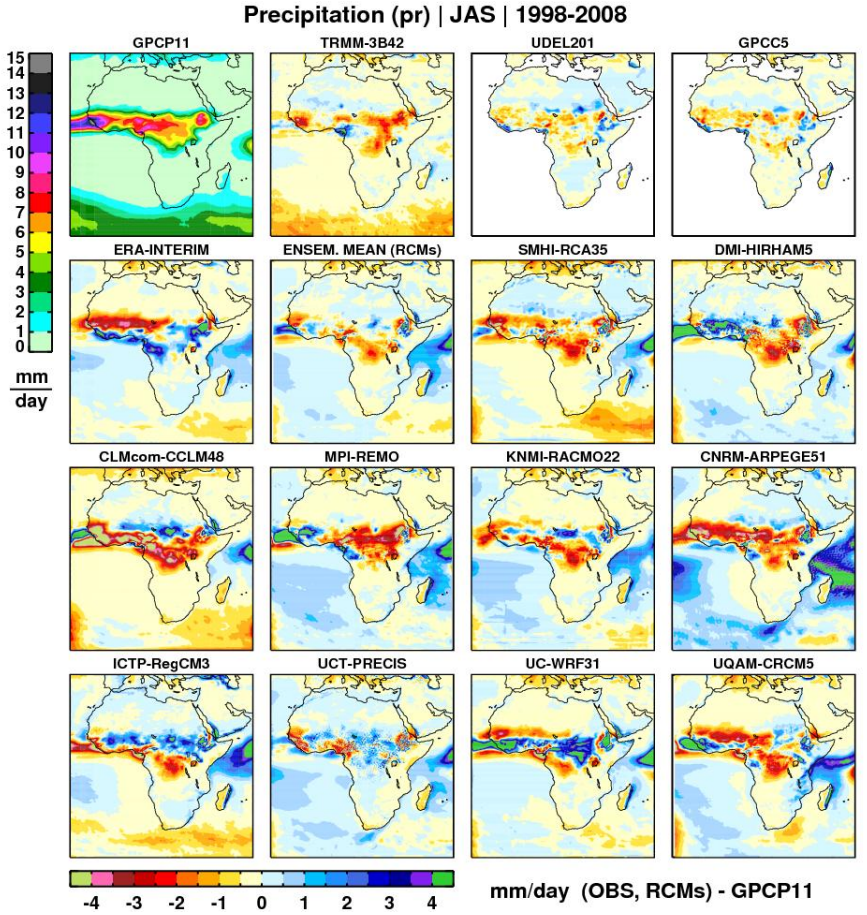


- 13 domains with a resolution of 0.44° (approx. 50x50km²), focus on Africa
- Also higher res for some domains (by some institutions)

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 & GPCP-ERAINT control experiment

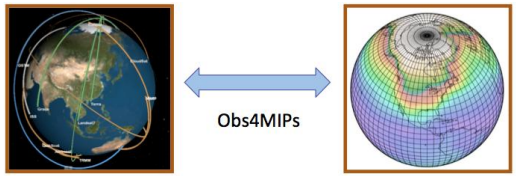


Example of CORDEX multi-model data available for Africa. From Top to bottom and left to right: GPCP mean July-August-September precipitation for 1998-2008 and differences compared to GPCP in the other gridded observations, and the individual RCMs with their ensemble average.

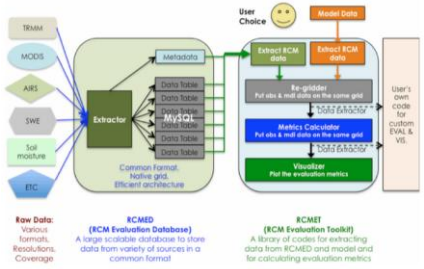
Nikulin, G., et al, J. Clim, 2012

Tools and Requirements

- Models and observations: Earth System Grid, http://www.earthsystemgrid.org/



Regional Climate Model Evaluation System



- Community of stakeholders and end-users: communication and outreach

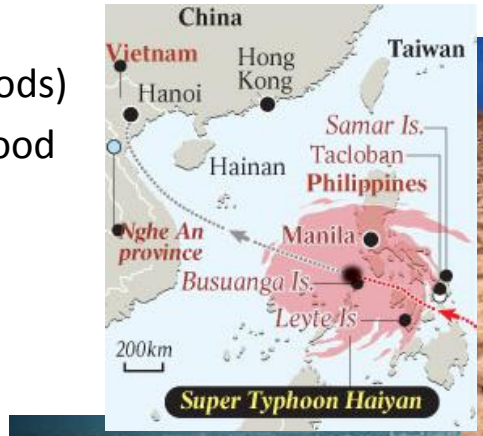
Find us on Facebook

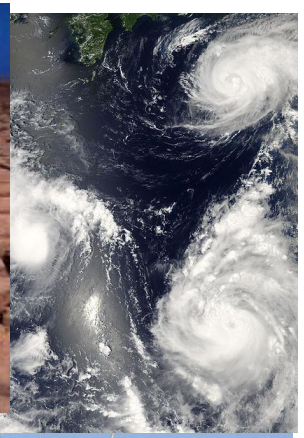
Follow us on Twitter

http://wcrp-cordex.ipsl.jussieu.fr/

Why is Monsoon Asia high on WCRP's regional agenda?

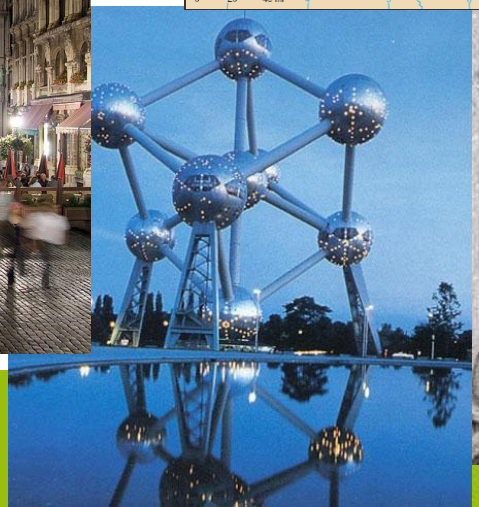
- Range of natural hazards (typhoon, floods)
- Seasonal monsoon affects water and food
- World's highest mountains
- Heat source of Tibetan Plateau
- 3.6 billion people
- Anthropogenic aerosols
- Rapid urbanization
- Vulnerable coastal development
- IPCC ARs regional needs
- GFCS





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/
- 480 participant, 97 countries



OUTCOMES AND PRIORITIES

- Dialogue and co-exploration with end-users (capacity building, training, local know-how, contributions to GFCS)
- Added value of RCM/SD: process studies, appropriate metrics, high resolution observations and data sets
- Uncertainty: multi-model, multi-methods, data fusion/distillery, post-processing/bias correction
- CORDEX-II Framework: domains, resolution, nesting, RESMs
- Publish your data, don't sit on it: ESGF

ORGANIZATION

- Coordination within and between regions (SAT, POCs, social media, etc)
- Ensure sustained CORDEX efforts, resource mobilization

With special thanks to all sponsors

and

to BMKG for hosting the meeting!

Last but not least:

A very warm welcome to CORDEX Southeast-Asia!