

Evaluation Of CORDEX Simulations Using obs4MIPs/ana4MIPs & NASA Datasets

A Proposal for a CORDEX *Flagship Pilot Project*

Duane Waliser, Alexander Goodman, and Huikyo Lee

Jet Propulsion Laboratory, Caltech/NASA

with help, support and/or suggestions from

W. Gutowski (co-chair CORDEX), J. Glisan (ISU), M. Rixen (WCRP), I. Lake (SMHI), G. Nikulin (SMHI)

Coordinated Regional Climate Downscaling Experiment (CORDEX; www.cordex.org) is a Core Project of the World Climate Research Program (WCRP; www.wcrp-climate.org), with a goal to advance and coordinate the science and application of regional climate downscaling through global partnerships. CORDEX involves 14 subdomains worldwide, by which coordinated dynamic downscaling experiments are being performed to understand regional climate and variability, evaluate and improve regional climate models and downscaling techniques, produce coordinated sets of downscaled climate simulations and projections, and foster communication between the climate projection and climate stakeholder communities.

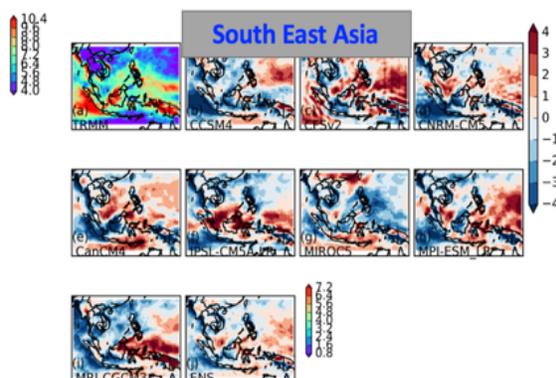
A critical component of CORDEX are the regional climate models (RCMs) that are used to downscale the global climate model simulations and projections (e.g. typically from CMIP), and provide guidance for local/regional policy and decision support relative to climate change. Because of the potential role these RCMs (may) have, it is a high priority to bring as much observational scrutiny to them as possible. This requires the systematic application of observations; enabling such multi-variate evaluations is essential for advancing model development, and for performing quantitative model comparison and uncertainty analyses.

The **goal** of this proposal is to perform a multi-domain, multi-model, multi-variate model evaluation. This evaluation will be based on:

- **16 Variables:** a) precipitation from TRMM & GPCP, b) net longwave & shortwave radiation at the surface and TOA from CERES, c) temperature & water vapor at 850, 500 and 200 hPa from AIRS, d) 2m temperature, 850 & 200 hPa zonal and meridional wind, and sea level pressure from MERRA-2 and ERA-I.
- **5 Evaluation Metrics:** a) bias, centered RMS and Taylor plots for climatological annual and seasonal means, b) temporal correlation and centered RMS for 12-month annual cycle.
- **CORDEX Domains:** Include all domains and its models for which all or part of the above variables are accessible via ESGF or otherwise by CORDEX domain technical point of contact.
- **CMIP5 GCMs:** Including a small number (~6) of select GCMs used for driving CORDEX RCMs.

The **outcomes and deliverables** include:

- **Display of the evaluation metric results** on easy to navigate web pages (e.g. at rcmes.jpl.nasa.gov), categorized by domain, that would be linked to the CORDEX project web page.
- **Tutorials and reproducibility** - Documentation of the procedures and software tools used to produce the metrics, with tutorials on how to extend the open source evaluation code/scripts to use other observations (e.g. CRU) or metrics, including how to obtain **CORDEX data** from the **ESGF** and observations from **obs4MIPs** and **ana4MIPs**.



Examples

