

General Aims of CORDEX

Generate a coordinated ensemble of high-resolution, historical/future regional climate projections for land-regions of the globe sampling; multiple GCM/RCP/RCM/ESDs methods. 1st phase based on CMIP5 historical-projection runs and/or ERA-int boundary data

*Make data accessible & useable in common format/file structure
Now ~99% same as CMIP5 and compatible with ESG2.*

Foster coordination between downscaling efforts & encourage local participation, *in generating, analysing & communicating potential regional climate change and associated uncertainties & risks*

Initial emphasis on African climate & IAV: START/WCRP sponsored 3 analysis/IAV workshops for an Africa-CORDEX team in 2011-12

Similar activities now starting for South Asia, East Asia and South/Central America

CORDEX Phase I experiment design

Model Evaluation
Framework

Climate Projection
Framework

Multiple regions (Initial focus on Africa)
50km resolution (higher in some regions, Europe: 10km)

ERA-Interim BC
(1979)1989-2010

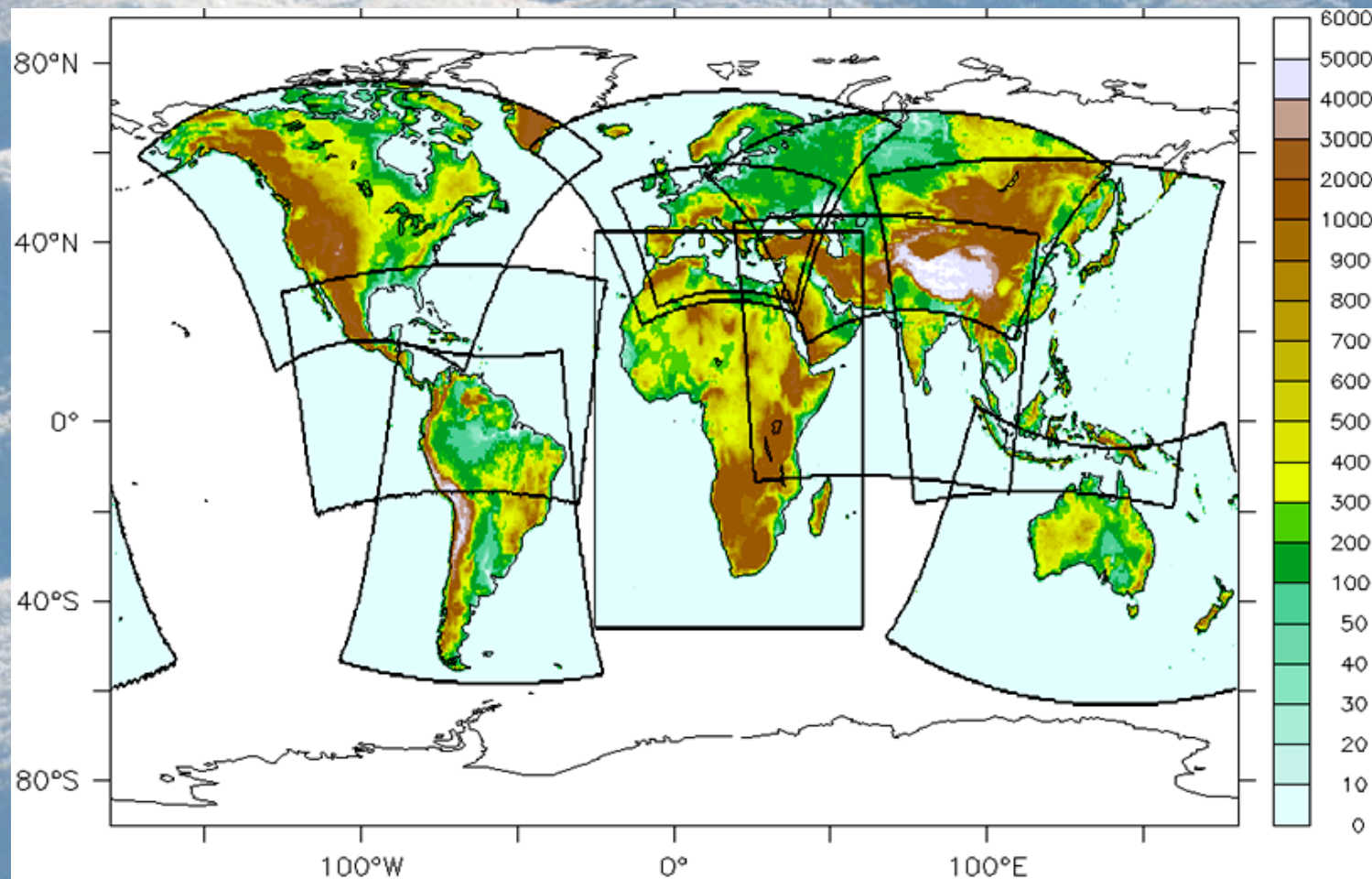
RCP4.5, RCP8.5
some RCP 2.6 runs

Multiple AOGCMs

Regional Analysis
Regional Databanks
Europe, Korea, S.Africa

Regional Projections 1950-2100

CORDEX DOMAINS (also Arctic & Antarctica)



- 12 domains with a resolution of 0.44° (approx. $50 \times 50 \text{ km}^2$)
- Initial Focus on Africa
- High resolution $\sim 0.11^\circ \times 0.11^\circ$ for Europe (~ 6 institutions)

CORDEX now has a Science Advisory Team (3 year mandate) that will report to the new WG on Regional Climate (Science & Informatio) *relationship to WGCM presently unclear (to me)*

CORDEX SAT had its first telecon Sept 13 2012

Members:

Colin Jones (co-chair, Eur, Arctic)

Filippo Giorgi (co-chair, Med)

Bill Gutowski (N Am, Arctic)

Silvina Solomon (S Am)

Won Tae Kwon (East Asia)

R. Krishnan (South Asia)

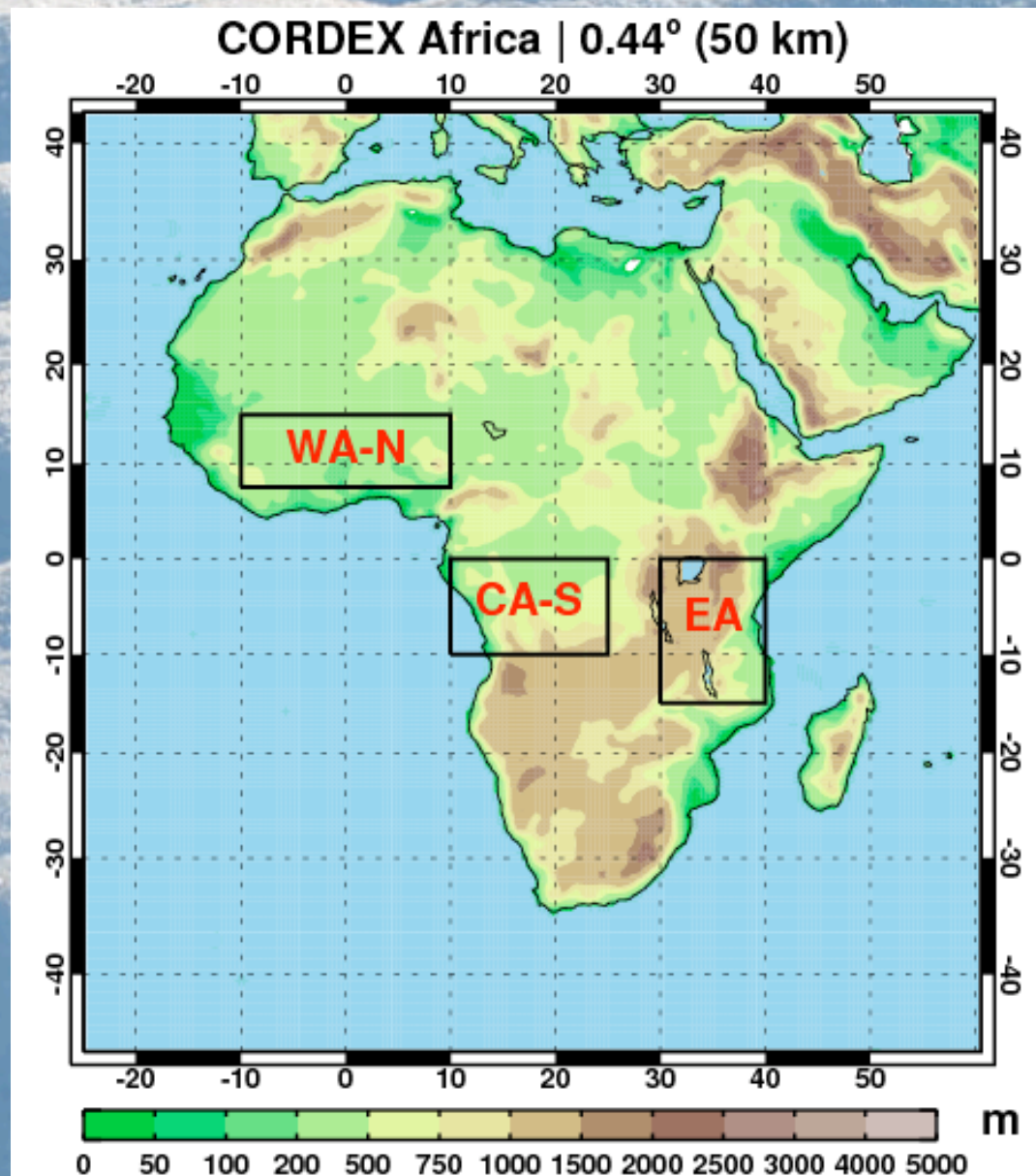
Bruce Hewitson (Africa)

Clare Goodess (IAV)

Michel Rixen (WCRP)

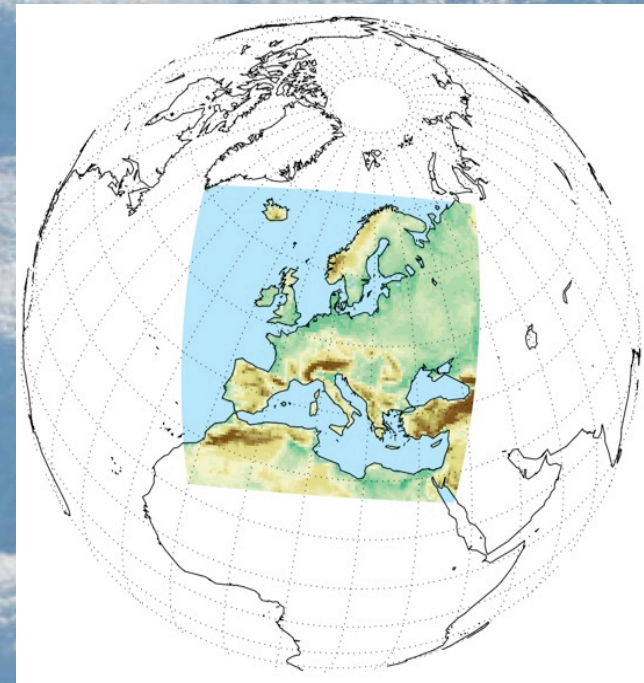
Areas not directly covered by SAT: Australasia, ARAB-MENA

Africa-CORDEX status



RCM Scenarios for Europe – EURO-CORDEX

- Area: Europe
- Emission scenarios:
RCP4.5, RCP8.5, RCP2.6
- Driving GCMs: *CMIP5*
- Grid spacing: 12.5 km, 50 km
- Period: 1951 - 2100
- Ensemble size: in total >70 simulations
(3 emission scenarios, 2 resolutions, several GCMs, several RCMs)
- Availability: 2013
- Further information:
 - Homepage: <http://www.euro-cordex.net/>
 - Contact: andreas.gobiet@uni-graz.at,
daniela.jacob@hzg.de



→ ~25 very high (0.11°) resolution simulations based on the new rcp scenarios
→ ~45 moderate (0.44°) resolution simulations based on the new rcp scenarios

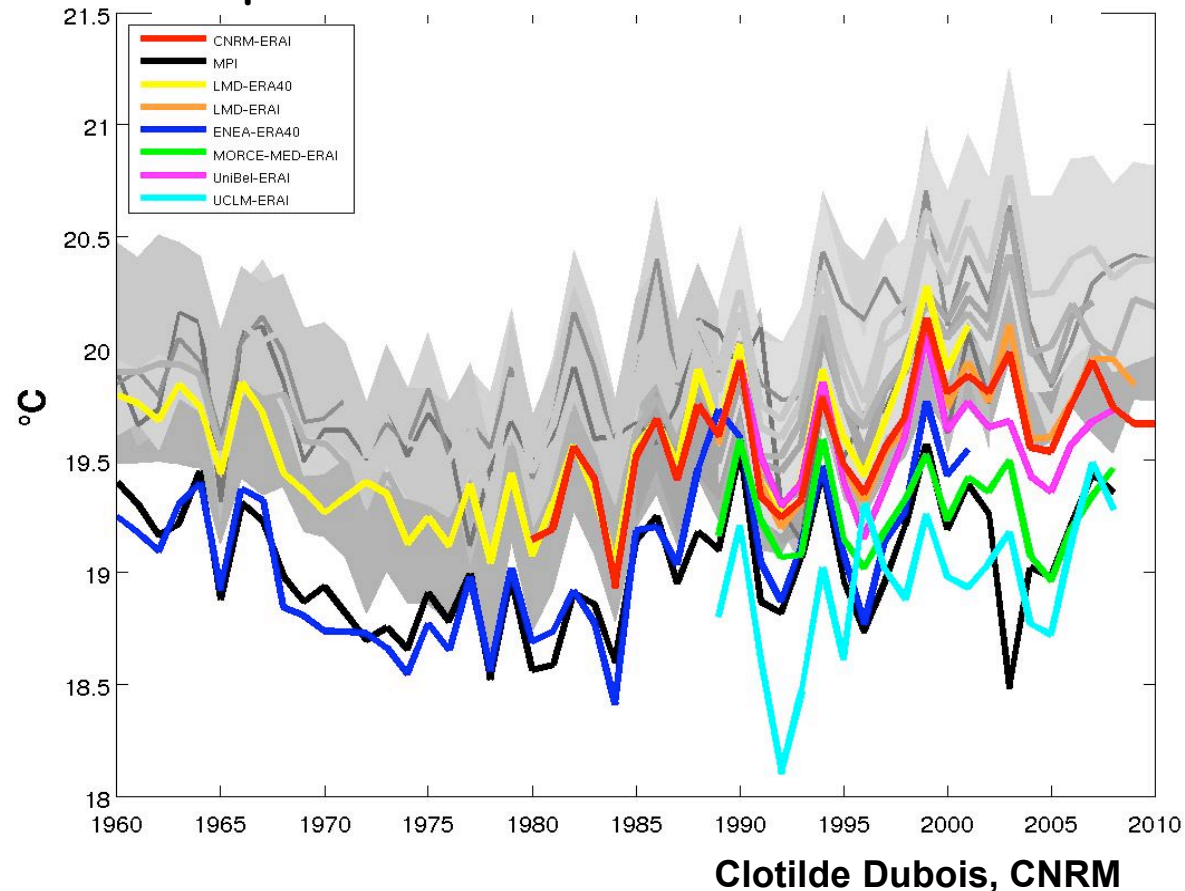
Med-CORDEX: Coupled RCM simulations for Mediterranean/Black Sea

Atmos-only: 50km and 10-20km resolutions

RegCM3/4, ALADIN, REMO, LMDZ, EBU, WRF, CLM, PROMES

Coupled RCM 10-20km resolution: ENEA, MPI, CNRM, LMD, U.Belgrade, MORCE-Med, UCLM, INSTM, CLM, UAH, IC3, CMCC

Coupled RCM simulated Mediterranean SST



ERA-int (1979-2010)
runs completed

RCP runs on-going

Database open early
2013

www.medcordex.eu

samuel.somot@meteo.fr
paolo.ruti@enea.it

CORDEX-South America: Update September 2012

1) ERA-Interim simulations (all finished)

- List of the participating models/labs (all runs in 50 km resolution):
 - RegCM3/University of Sao Paulo-Brazil
 - REMO/Max Plank Institute/Climate Service Center-Germany
 - LMDZ/IPSL-France
 - PROMES/UCLM_spain
 - ETA/INPE-Brazil
 - RCA/SMHI_Sweeden
 - MM5/CIMA-Argentina
- *The ERA-Interim runs performed under the CLARIS-LPB project.*
- *Database opening by March 2013.*

2) RCP simulations period: 1951-2100 resolution: 50 km

- List of regional models driven by CMIP5 global models
 - LMDZ/IPSL RCP4.5 finished
 - REMO /MPI RCP4.5, RCP8.5, RCP2.6 finished
 - RegCM4/ not sure about driving GCMs RCP4.5, RCP8.5, RCP2.6 on-going
 - PROMES/various GCMs RCP runs on preparation
 - RCA4 RCP runs planned

3) Publications

Solman et al, (2012) under revision Clim Dyn
Marengo et al., (2012) Under revision Clim Dyn
Samuelsson et al (2012) in preparation

CORDEX data will now be available through the ESG. Initially at DKRZ and BADC, soon followed (early 2013) by CORDEX ESG nodes in Sweden, Denmark, Italy and South Africa. Hopefully later Korea, India +++

**Africa data (SMHI, CLM & REMO) will go live at the DKRZ ESG late 2012.
~April 2013: Euro-CORDEX (DKRZ), Med-CORDEX (ENEA).**

The screenshot shows the ESGF Portal interface in a Mozilla Firefox browser window. The browser title is "ESGF Portal - Mozilla Firefox". The address bar shows "ESGF Portal". The page features the ESGF logo (Earth System Grid Federation) and a circular "EUCLIPSE" logo. A navigation bar includes links for Home, Search, Tools, and Login. On the left, there are sections for "Current Selections" (with links to remove all, institute:SMHI, time frequency:day, and text:CORDEX) and "Search Categories" (listing Project, Institute, Model, and Instrument). The main search area includes a search bar, a "Search" button, and checkboxes for "Search All Sites", "Show All Replicas", and "Show All Versions". Below the search bar, it indicates "displaying 1 to 1 of 1 search results". The search results are displayed in a table with columns for "Results" and "Data Cart". The first result is "cordex.EUR-44.SMHI.ERAINT.evaluation.r1i1p1.SMHI-RCA4.v1.day.v1|euclipse1.dkrz.de (28 files)". The result is checked, and there are buttons for "Remove All" and "WGET All Selected". At the bottom right, there are links for "Collapse", "WGET", "Globus Online", and "Remove".

ESGF Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

ESGF Portal

ESGF Earth System Grid Federation

EUCLIPSE

Home Search Tools Login

Current Selections

[remove all](#)

[\(x\) institute:SMHI](#)

[\(x\) time frequency:day](#)

[\(x\) text:CORDEX](#)

Search Categories

Project

cordex (1)

Institute

SMHI (1)

Model

Instrument

Search

☐ Search All Sites ☐ Show All Replicas ☐ Show All Versions

< 1 > displaying 1 to 1 of 1 search results

Results Data Cart

☒ Show all files ☐ Filter over search constraints

Remove All WGET All Selected

☒ cordex.EUR-44.SMHI.ERAINT.evaluation.r1i1p1.SMHI-RCA4.v1.day.v1|euclipse1.dkrz.de (28 files)

[Collapse](#) | [WGET](#) | [Globus Online](#) | [Remove](#)

[OPENDAP](#) [GridFTP](#) [HTTP](#)

CORDEX Meeting/Conference updates

2nd pan-CORDEX conference: Nov 4-7 2013, Brussels, BE

Conference jointly organized by EC, WCRP and IPCC (WG1)
To be held at the EC Charlemagne conference centre

Date is between release of IPCC WG1 (Sep 2013) and WG2 (March 2014)

The first day will be a high-level segment with:

- a) IPCC presentation/discussion of WG1 findings to the EC
- b) A high-level stakeholder event (possible WG2 representation)

Days 2-4: 3-day CORDEX science conference

Time Schedule:

- ~end 2012 : Call for papers
- ~March 2013: Close of call for papers
- ~May/June 2013: Notification of acceptance
- ~summer 2013: Registration

Regional conference/workshops/training events

Africa-CORDEX has held 3 training workshops with 3 Regional evaluation teams (west, east & southern Africa), run by UCT.

Resulted in 3 papers (one per team) submitted to international journals analyzing the ERA-interim Africa-CORDEX ensemble

Discussion ongoing to extend these workshops into a series targeted towards societal impacts linked to RCP runs and case study examples.

A series of workshops (targeting model evaluation training and links with regional IAV communities) kick-off at IITM, Pune, Oct 17-20
2nd East Asia CORDEX conference in Korea Nov 6-8

3 workshops linking CORDEX-IAV communities across (South, East, South-East) Asia to occur 2013-2015, pending funding from APN.

2nd Euro-CORDEX workshop to be held in Hamburg Nov/Dec 2012

1st Arctic CORDEX planning workshop held in Sweden March 2012

2 South America/Central America CORDEX-IAV regional workshops planned for 2013 in collaboration with VAMOS project

Observations for CORDEX

High resolution (10-50km) and land region emphasis

NASA-JPL have developed a tool somewhat like Obs4MIP using NASA data for RCM evaluation: <http://rcmes.jpl.nasa.gov>

RCMES has established links for evaluating CORDEX simulations with:

Africa : strong collaboration (NSF and CKDN funded)

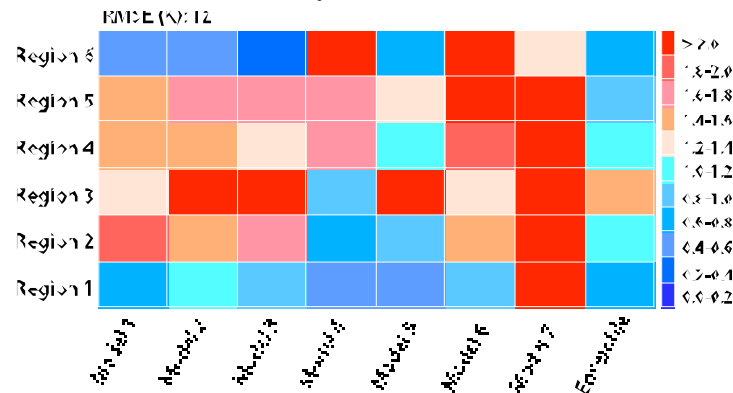
South Asia (IITM visited JPL, and JPL scientists will attend the South Asia CORDEX meeting)

North America : collaboration with NARCCAP

Collaboration starting with Arctic-CORDEX

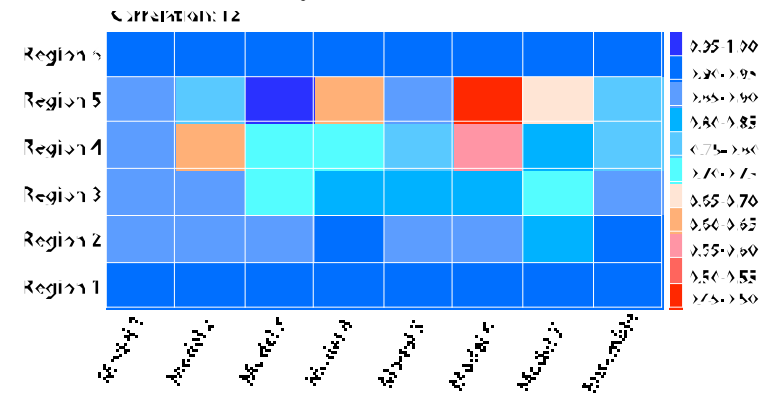
Performance comparison across RCMs for regions of Africa (e.g. 2m-temp)

Annual Cycle RMSE(K)



T2m

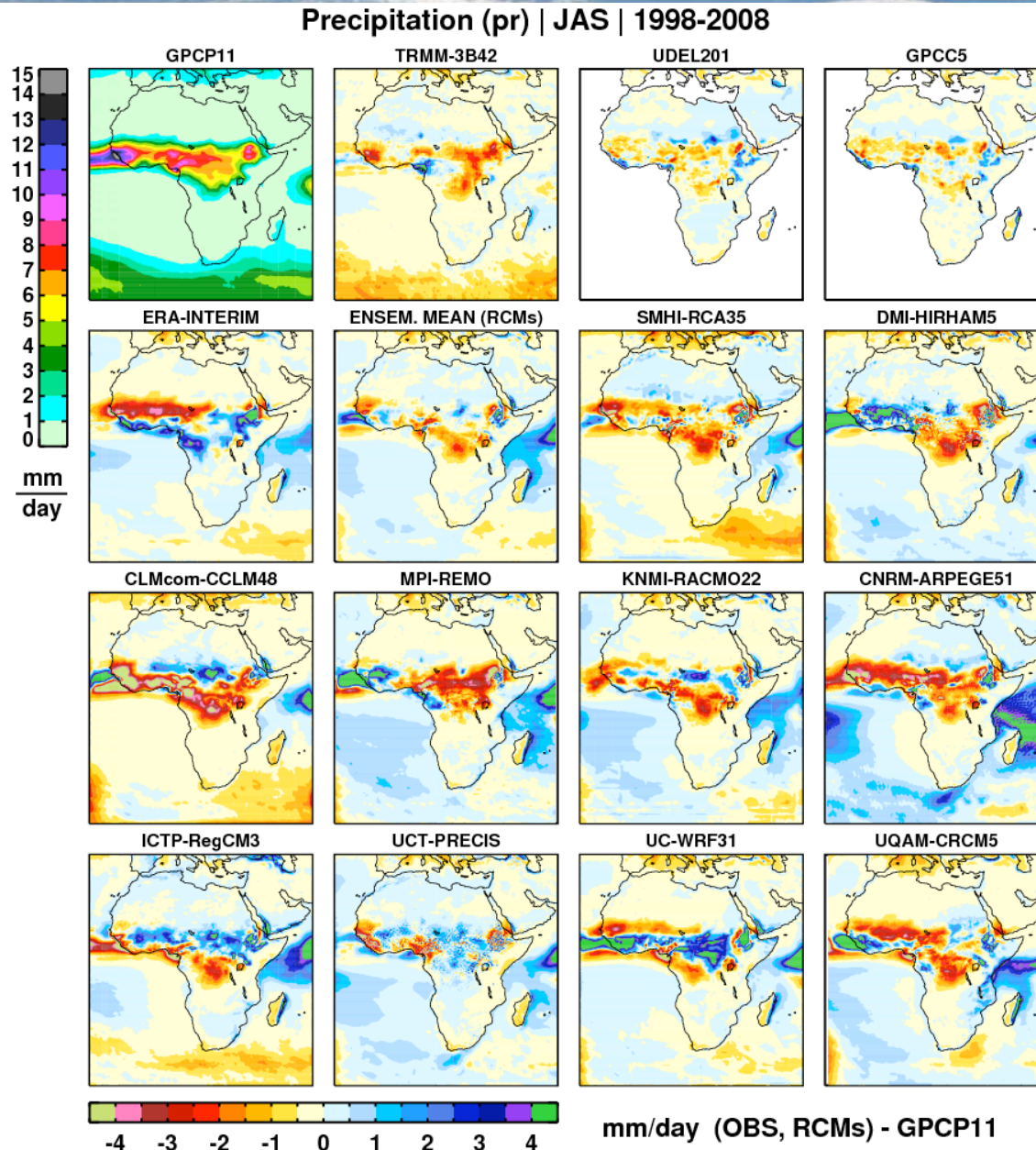
Annual Cycle Correlation



TMin

TMax

JAS precipitation bias relative to GPCP

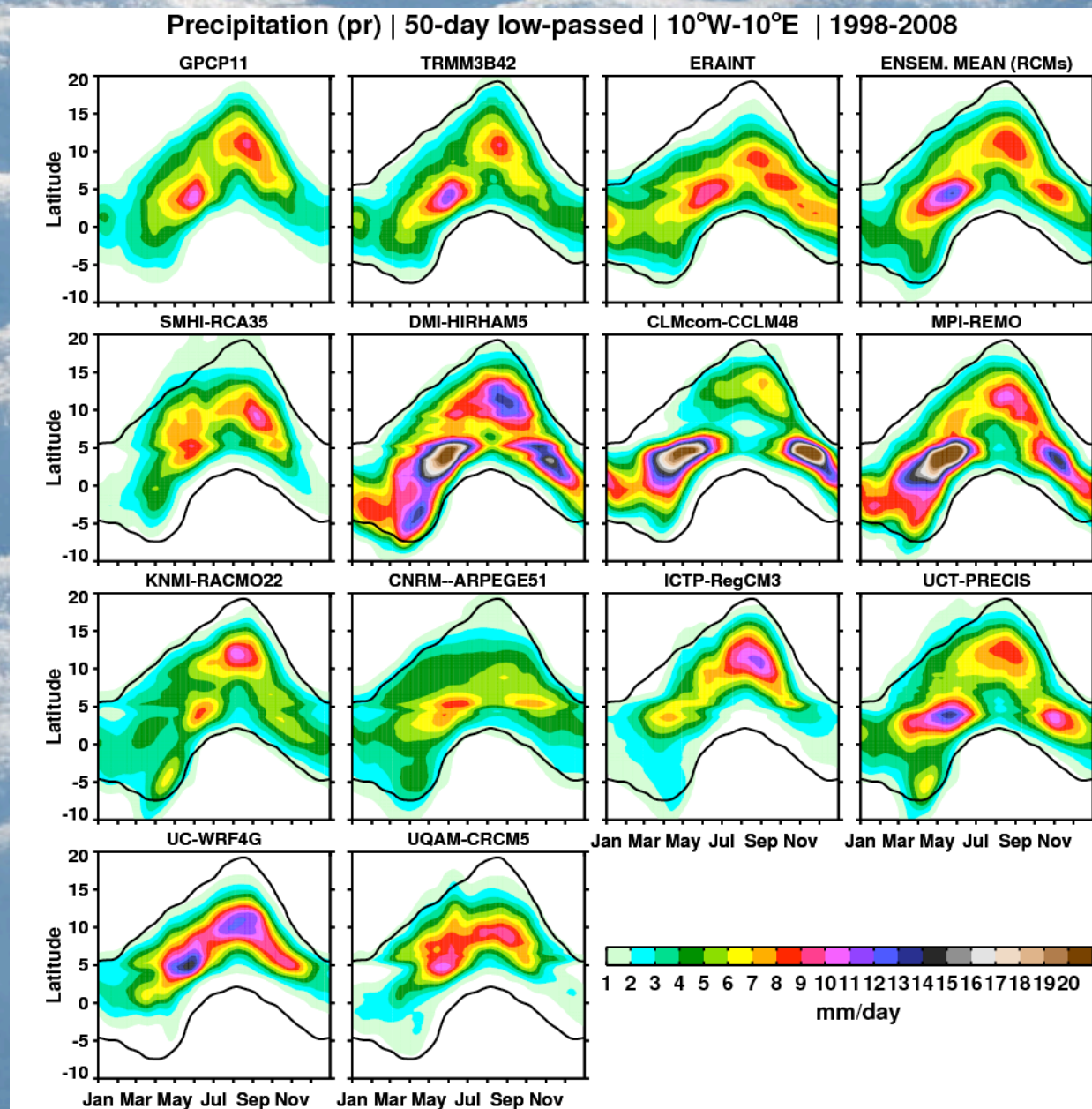


1st CORDEX ensemble was Africa-ERAint BC 1989-2008.

10 RCMs contributed.

4 papers (so far) with 3 written by the Africa CORDEX evaluation teams

West African monsoon: Annual cycle of WAM poleward progression

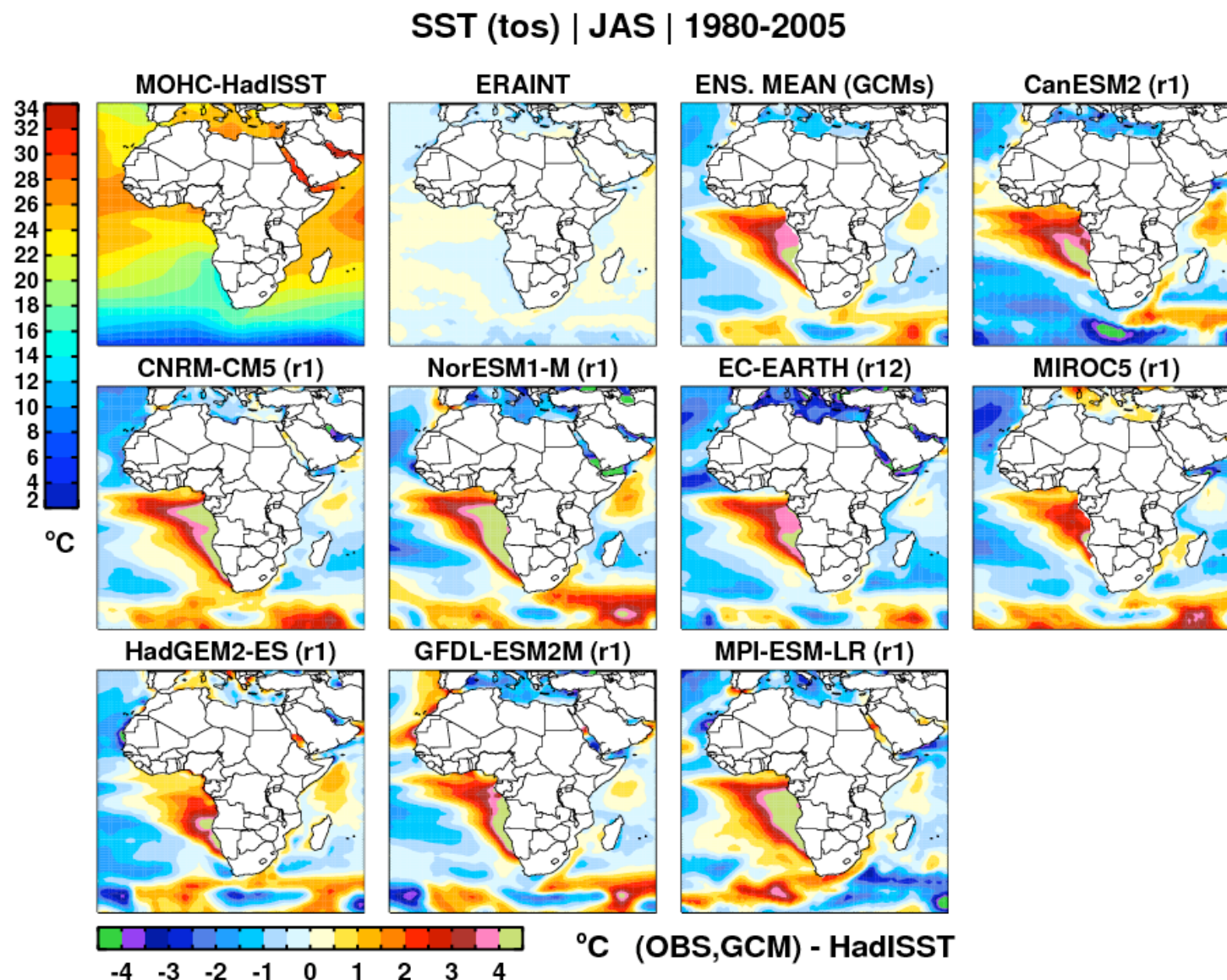


SMHI- RCA4 Africa CORDEX 50km matrix

GCM	Historical 1950-2005	RCP8.5 2006-2100	RCP4.5 2006-2100	RCP2.6 2006-2100
EC-Earth	✓	✓	✓	✓
HadGEM	✓	✓	✓	✓
CNRM	✓	✓	✓	
MIROC5	✓	✓	✓	
NorESM	✓	✓	✓	
CanESM	✓	✓	✓	
GFDL-ESM	✓	✓	✓	
MPI-ESM	✓	✓	✓	✓
IPSL-CM	☑	☑	☑	
CSIRO	☑	☑	☑	
NCAR	☑	☑	☑	

✓ Completed
 ✓ Running
 ✓ Planned
 ☑ Possible

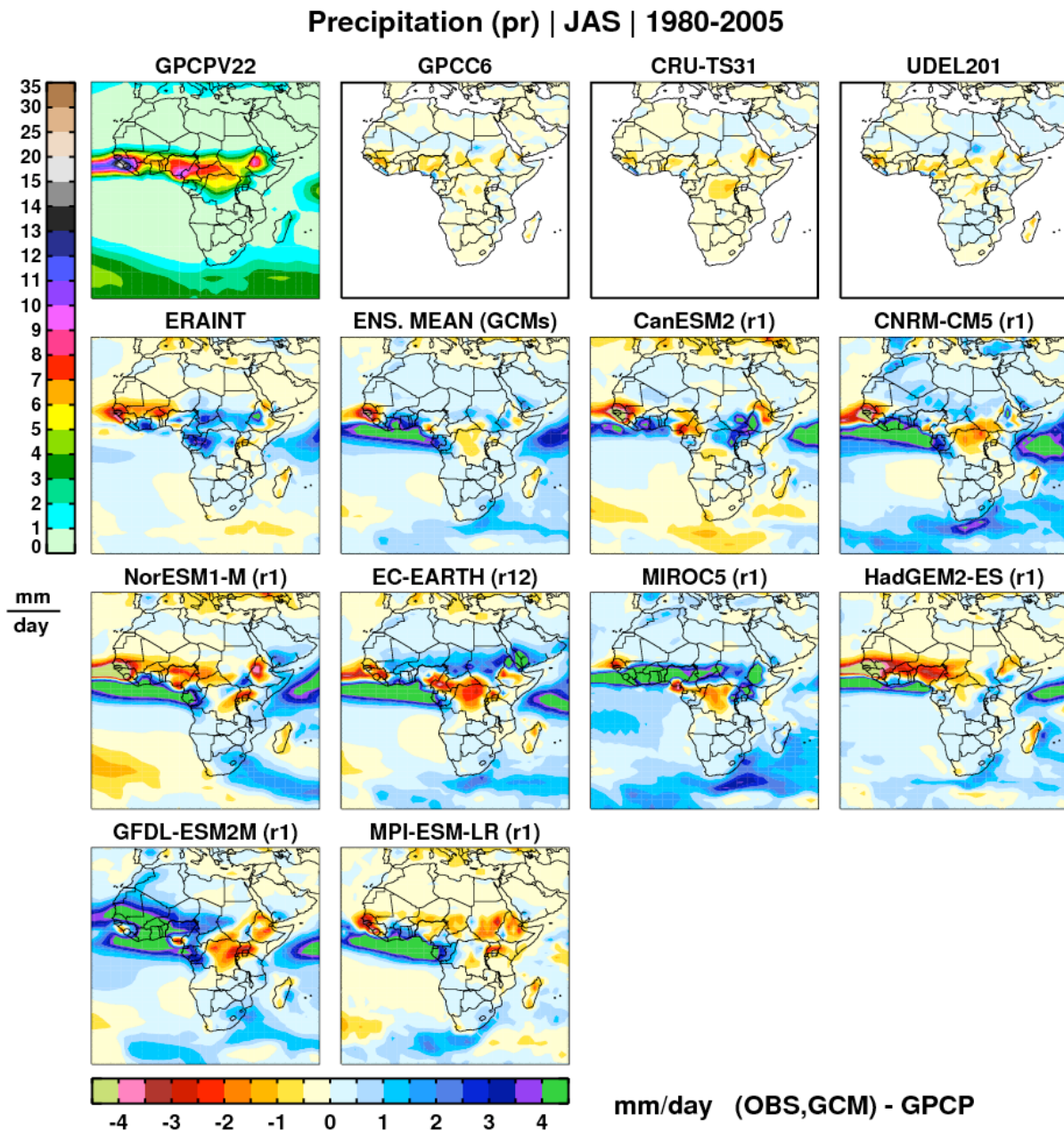
Systematic SST errors from CMIP5 historical simulations



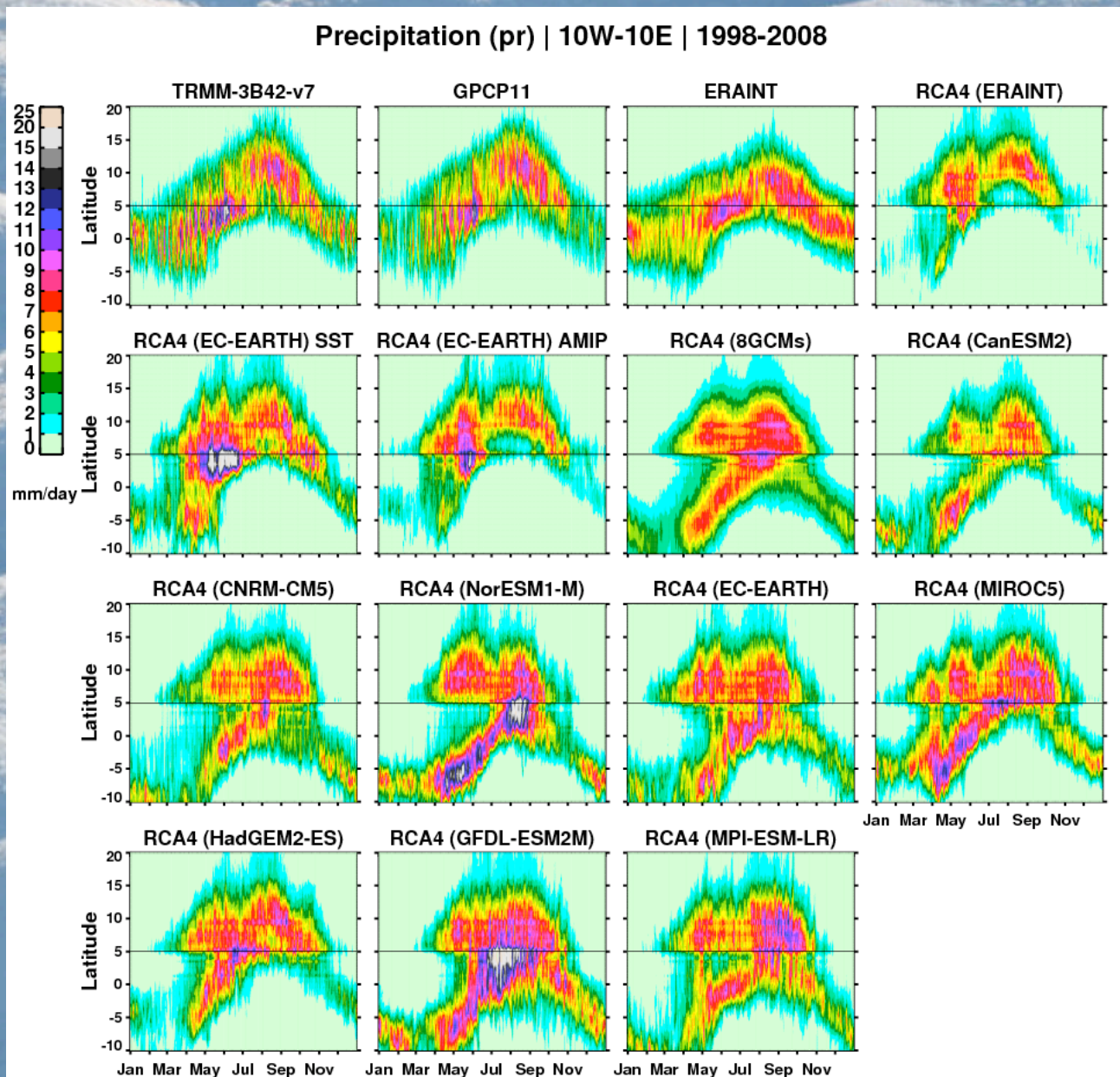
GCM precipitation errors reflect the SST error

Precipitation (pr) | JAS | 1980-2005

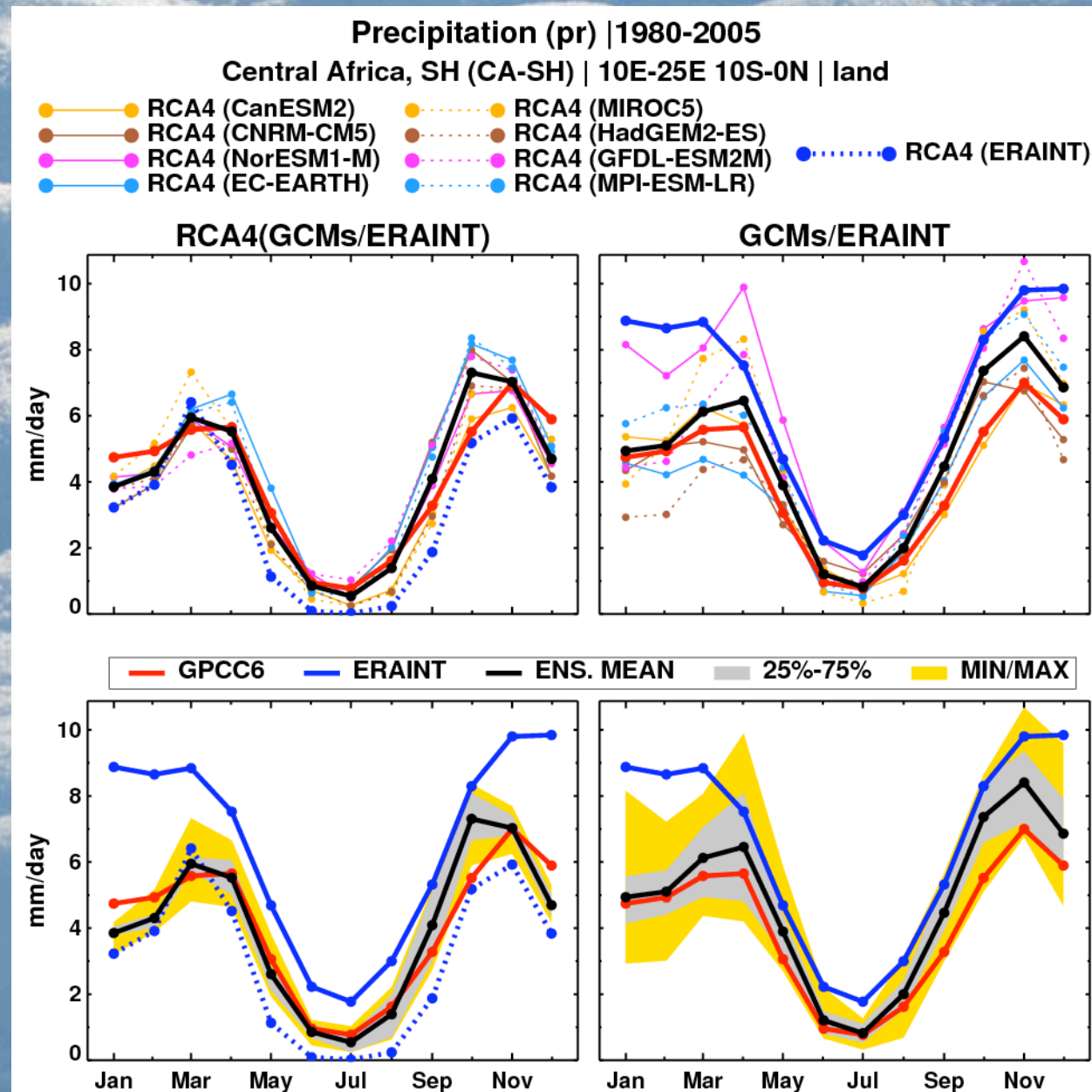
mm/day (OBS, GCM) - GPCP



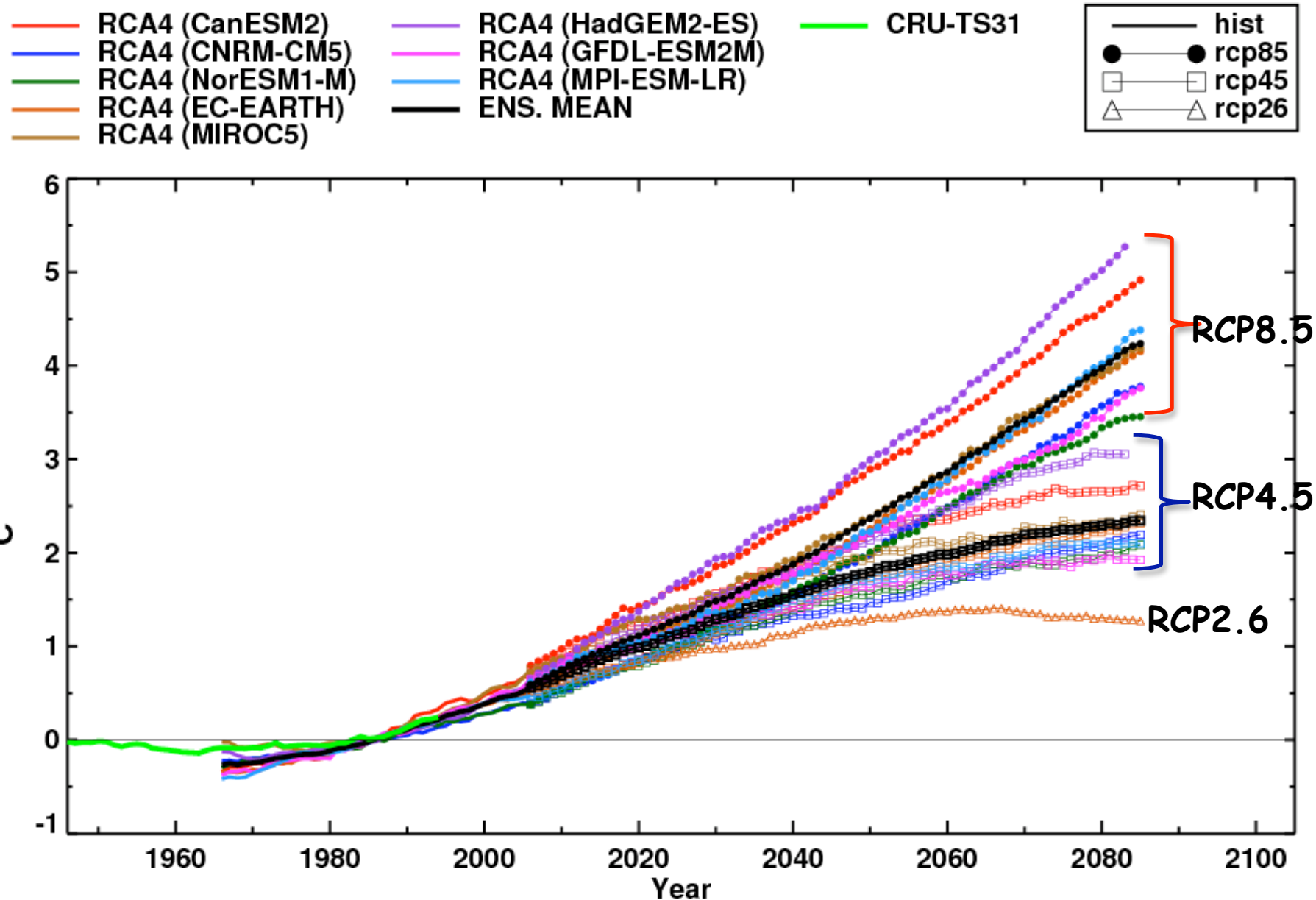
And carries through to RCM downscaled simulations



RCMs can improve certain climate features and narrow the ensemble spread



2m Temperature (tas) anomalies wrt 1971-2000 | 31-yr. mov. mean | JFM |
Africa (AFR) 20W-50E 40S-35N | land



Soil moisture (mrso) | JAS | CTL: 1971-2000 | SCN: 2071-2100 | rcp45

