

Ongoing evolution of CORDEX

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on behalf of the
CORDEX Science Advisory Team



CORDEX goals and vision

CORDEX has the science goals, not only providing datasets

1. To better understand relevant regional/local climate phenomena, their variability and changes, through downscaling.
2. To evaluate and improve regional climate downscaling models and techniques
3. To produce coordinated sets of regional downscaled projections worldwide
4. To foster communication and knowledge exchange with users of regional climate information

The CORDEX vision is to advance and coordinate the science and application of regional climate downscaling through global partnerships

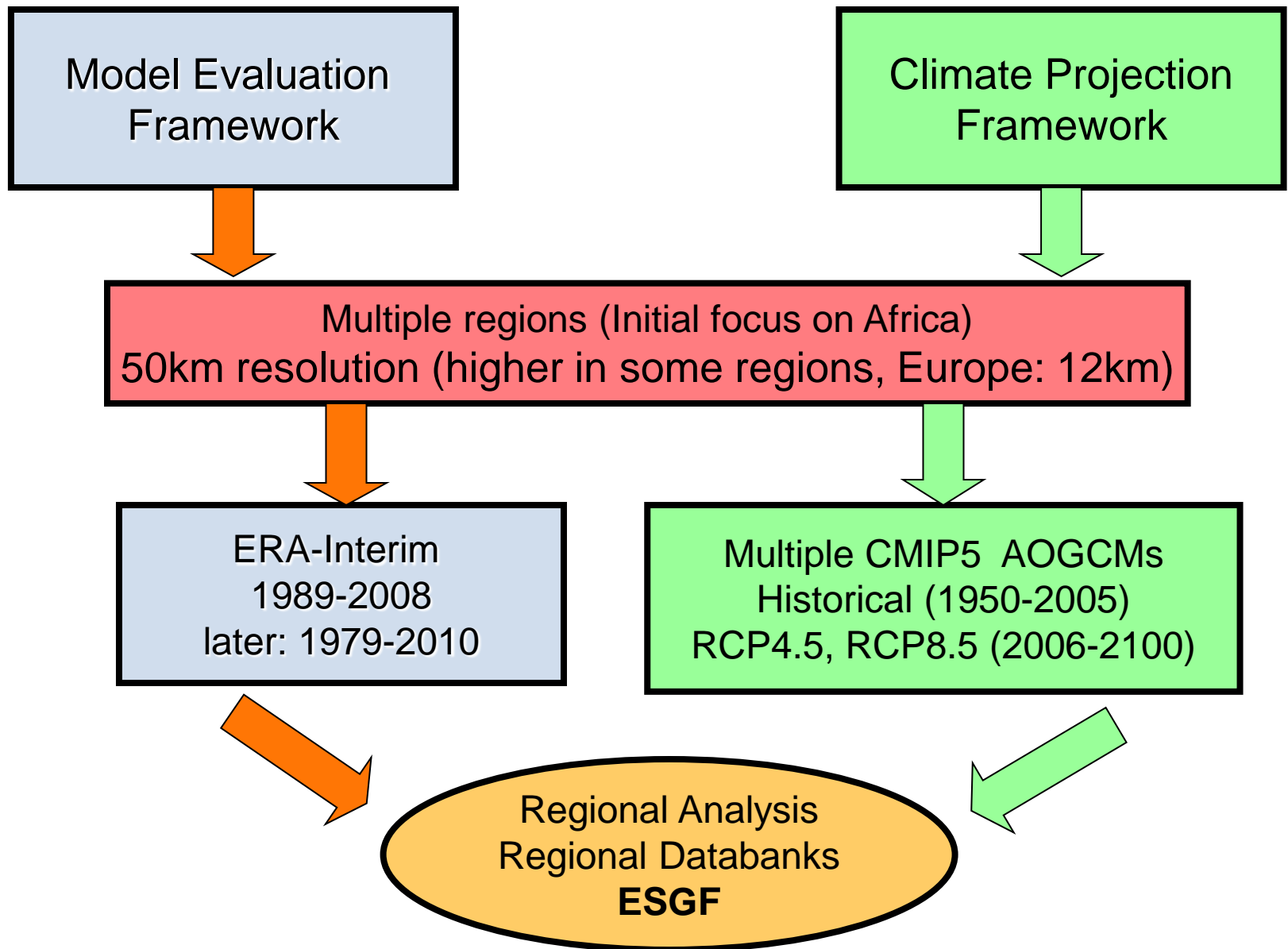
CORDEX Management and Coordination

- **CORDEX Science Advisory Team (SAT)**, 12 members, two meeting SAT1 - May 2014 and SAT2 – Feb 2015



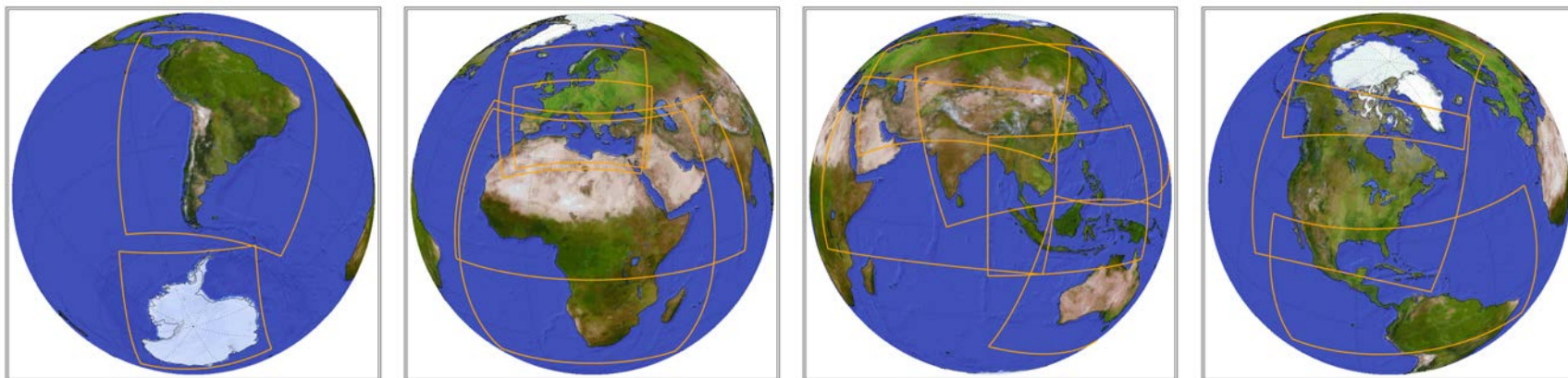
- **International Project Office for CORDEX (IPOC)** hosted by SMHI (Sweden) since January 2015 (Eleanor O'Rourke)
- CORDEX archiving is coordinated by IS-ENES
- Regional Points of Contacts (POCs), 2-3 per region

CORDEX Phase I experiment design



CORDEX Domains

- 12 CORDEX domains were defined in 2009
- 2 new domains came later: Middle East North Africa (MENA) in 2012 and South-East Asia (SEA) in 2014
- Each CORDEX domain has 2-3 Points of Contact (POCs)



- there are comments/suggestions on domain configuration in the CORDEX community (extension, resolution etc.)
- a domain criteria document is in preparation (April 2015)
- the document provides a number of criteria for selecting and updating CORDEX domains: scientific relevance, user needs, capability requirements, configuration and sensitivity studies

CORDEX Archiving

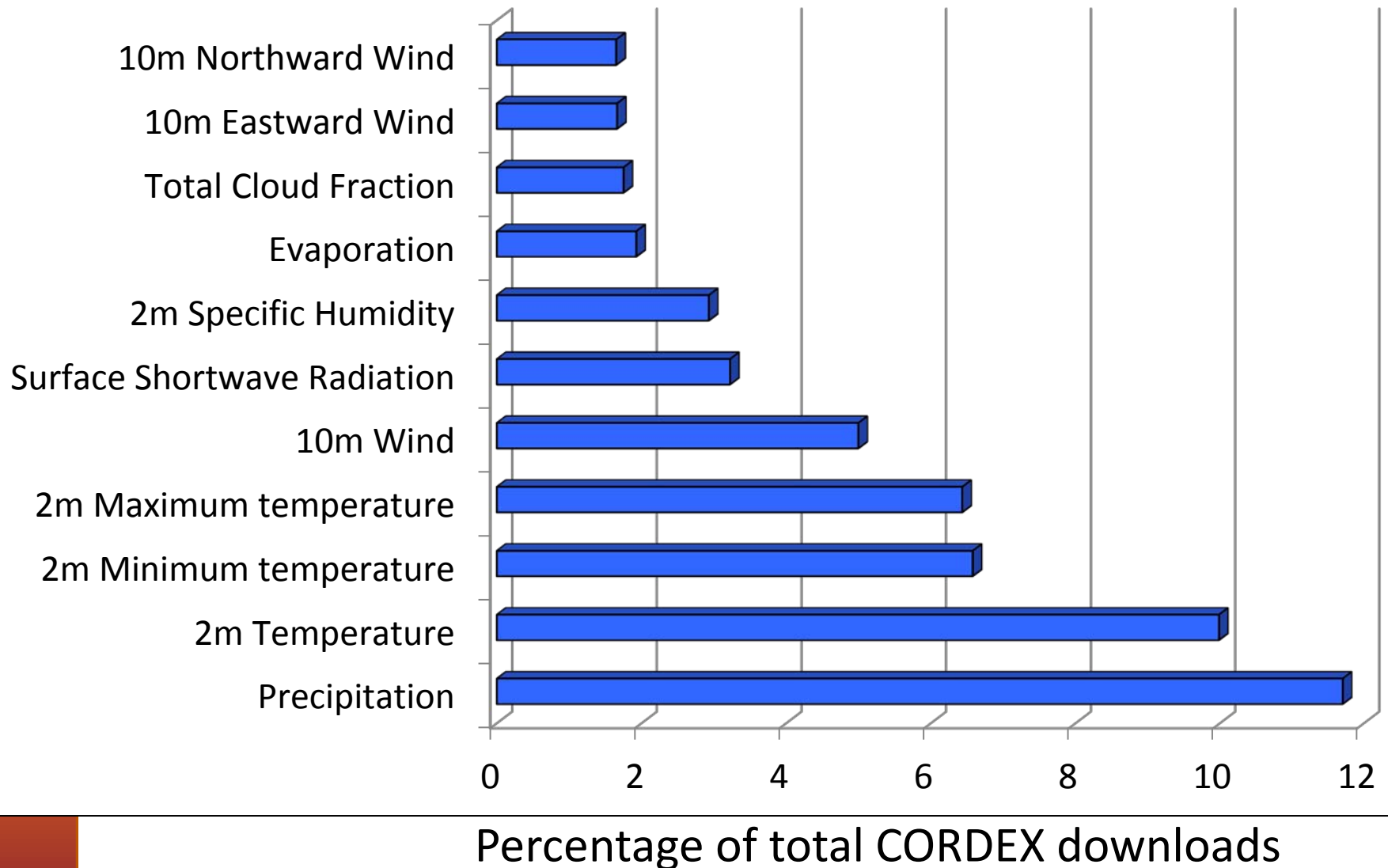
- a common CORDEX standard for archiving RCM output has been established
- the main focus on Earth System Grid Federation (ESGF), although 3 Regional Data Portal also exist (moving to ESGF)
- **CORDEX-ESGF** is in operation since mid-Sep 2013 (1436 users, 12Apr 2015), many simulations already available
- complexity of post-processing of RCM output to the CORDEX format was strongly underestimated, still a bottleneck for many CORDEX RCM groups
- a common tool for post-processing like Climate Output Model Rewriter (CMOR) in CMIP5 is not available but work is ongoing

detailed instructions on CORDEX website:

“How to submit data - RCM” and “How to access the data?”

Most popular CORDEX variables

11 variables are about 50% of total CORDEX downloads
(based on 7 CORDEX domains, ~130 simulations, SMHI-RCA4)



Empirical statistical downscaling (ESD)

- the current CORDEX objectives and activities are strongly RCM dominated
- Some ESD techniques may be very difficult to integrate into the CORDEX framework
- It may be impossible for most ESD methods to work in current CORDEX domains (large and insufficient observation)
- One goal is the comparison between ESD and RCM (scientific questions rather merely a technique comparison)
- 1st and 2nd CORDEX ESD workshops (Sep 2013 and Aug 2014)
- 3rd ESD workshop will be on 1st-3rd June 2015 (Cape Town)
- sub region studies in South America and Africa are underway
- ESD experiment protocol now available on CORDEX website

CORDEX Regional Training Workshops

many CORDEX-related regional training workshops:

- 4 Africa CORDEX START training workshops (2011-2012) and a new workshop series is in planning
- 1st and 2nd WCRP CORDEX South Asia Training Workshops (Oct 2012 and Aug 2013)
- 1st and 2nd CORDEX Latin America and the Caribbean (LAC) training workshops (Sep 2013 and Apr 2014)
- CORDEX Asia ESGF training workshop (Dec 2014)

such training workshops are an integral component for developing the regional capacity for assessment of impacts of climate change on regional scales (+ establishing of regional teams)

interest to regional training workshops is very large but funding as usual is the main problem

Pan-CORDEX Conferences and Workshops

- regular CORDEX session at EGU (one full day)
- International conference on CORDEX (Mar 2011, Trieste)
- International Conference on Regional Climate CORDEX2013 (Nov 2013, Brussels); about 450 abstracts and more than 500 attendees; also VIA and stakeholders community
- Lund Regional Climate Modelling workshop (June 2014); too many were interested but capacity was limited by 250
- Next International Conference on Regional Climate **CORDEX2016** - 17-20 May 2016, Stockholm.



CORDEX next steps

- CORDEX has applied for CMIP6 endorsement requesting output downscaling (expected late 2016 or early 2017)
- a high demand on CORDEX bias-adjusted simulations: providing CORDEX data bias-adjusted by different methods (will be available on ESGF under “CORDEX-Adjust”)
- ongoing discussion about calculating and making available climate extreme indices (“CORDEX-Indices” on ESGF ?)
- Filling GCM-RCM matrices in different regions (collecting detailed information about existing simulation is ongoing)
- Moving to higher convective-permitting resolution
- Flagship Pilot Studies

Flagship Pilot Studies (FPS)

- one of the main recommendations of the CORDEX 2013 conference to address in depth key questions on the value of the CORDEX
- as part of the wider CORDEX strategy planning (5 year strategy) taking into account CMIP6 and the Grand Challenges
- start with one pilot study per domain and see how it works
- high resolution is not an absolute necessity but there must be some added value
- Specific FPS to be proposed by regions and must have
 - Fine-scale processes important to region's climate (physical basis)
 - Observational basis for verification (analysis basis)
 - User applications (VIA basis)
- Potential connection with other WCRP programs, esp. GEWEX