

The Coordinated Regional Climate Downscaling Experiment ([CORDEX](#)), launched by the World Climate Research Programme ([WCRP](#)) and overseen by its [Working Group on Regional Climate](#), is rapidly gaining momentum.

The 2nd WCRP CORDEX Science and Training Workshop, held 27th - 30th August 2013 in Kathmandu, Nepal (*p5*), has further facilitated the integration of CORDEX South Asia, East Asia, and Australasia (*p3*) efforts, and coordination with the newly established CORDEX Southeast-Asia initiative (*p2*).

Synergies between regional WCRP initiatives are leading to interesting collaborations, as illustrated by the recent “WCRP joint VAMOS/CORDEX Workshop on Latin-America and Caribbean - LAC: Phase I - South America” (11th-13th September 2013, Lima, Peru), a necessary venture to tackle the scientific challenges of regional climate downscaling where large scale ocean dynamics play a significant role (*p5*).

CORDEX networks and activities are also growing in the Middle East-North Africa (MENA), Central Asia, Arctic (*p3*), and Antarctic regions, which should see some exciting projects emerge soon.

Building on the successful distributed archiving system developed under the Coupled Model Intercomparison Project (CMIP), CORDEX is now adopting the same archiving protocols and standards within the Earth System Grid Federation (ESGF), which offers, along with the sister obs4MIPs and ana4MIPs initiatives, great prospects for scientific analysis by streamlining regional model assessment against global models, satellite data sets and reanalyses. You can read about a new data release on the Swedish ESGF node on *p6*.

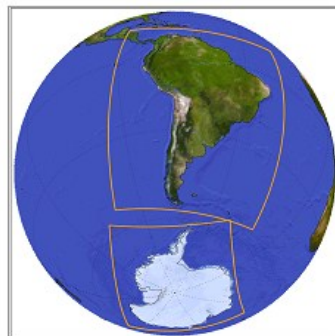
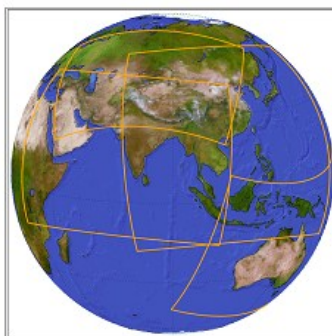
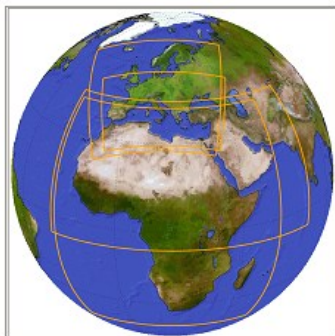
As announced in our first edition the International Conference on Regional Climate - CORDEX 2013 organized jointly between WCRP, the European Commission, and IPCC takes place 4th-7th November 2013 in Brussels (*p7*). This event will provide an excellent opportunity to review the current status, challenges, and opportunities of CORDEX and regional climate science allowing the community to prepare for the second phase of CORDEX. This will be a unique and exciting event and we look forward to seeing many of you there!

Last but not least, it is our pleasure to welcome William Gutowski as the new Co-chair of CORDEX, taking over Colin Jones, who has moved to a new role in the UK after 6 years at SMHI where he has been instrumental in developing CORDEX regional initiatives in Europe and elsewhere, and making regional climate information from downscaled models increasingly relevant for vulnerability, impact and adaptation applications.

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The CORDEX community



The CORDEX community has grown to now include 14 domains;

- Arctic CORDEX
- North America CORDEX
- Central America CORDEX
- EURO-CORDEX
- MED-CORDEX
- CORDEX Africa
- MENA-CORDEX
- Central Asia CORDEX
- South Asia CORDEX
- East Asia CORDEX
- South East Asia CORDEX*^{NEW}
- Australasia CORDEX
- South America CORDEX
- CORDEX Antarctica

NEW DOMAIN: South East Asia CORDEX

Contact: [Fredolin Tangang](#)



Prof. Fredolin Tangang

The CORDEX Southeast Asia is the latest addition to the CORDEX community. It evolves from a bottom-up initiative of a group of scientists from five countries (Malaysia, Indonesia, Vietnam, Thailand and the Philippines) that recognize the need for a coordinated climate downscaling activity in this region. At a workshop hosted by the VNU Hanoi University of Science in August 2012, these scientists subsequently formed the Southeast Asia Regional Climate Initiative (SEARCI), a platform for regional cooperation on climate related research. Subsequently under this initiative, a proposal on regional climate downscaling for the Southeast Asia region, coined as the Southeast Asia Regional Climate Downscaling (SEACLID) Project, was developed and headed by Prof. Fredolin Tangang of the National University of Malaysia. Two additional countries namely Cambodia and Lao PDR were later added into the group.

The project has successfully secured an APN funding under the ARCP Programme for three years starting October 2013. Recently SEACLID has been incorporated into CORDEX and is now known as the CORDEX Southeast Asia (CORDEX-SEA) with Prof. Tangang as its coordinator. A number of workshops have been planned for SEACLID / CORDEX-SEA with the first to be held in Jakarta from 18-20 November 2013 and to be hosted by the Indonesian Meteorological and Geophysical Agency (BMKG). This three-day workshop will be a project launching and preparatory workshop where representatives from countries involved, CORDEX, CORDEX South Asia and CORDEX East Asia, as well as potential collaborators of CORDEX-SEA, will be invited to participate. Potential end-users and policy makers are also welcome to attend for their useful inputs to the discussions. Details on the workshop can be found [here](#)



Arctic CORDEX

Contact: [John Cassano](#)

A number of the Arctic CORDEX groups have finished a first set of simulations with further simulations planned for the coming months; a summary of the current status can be found below:

Simulation type	Number completed	Number planned/ongoing
Hindcast (ERA-Interim evaluation) runs	6	8
Control (GCM-driven historical) runs	4	4
Scenario (GCM-driven RCP4.5 & RCP 8.5)	8	10

Arctic-CORDEX data has been provided by CCCma, HIRHAM, RCA, and WRF regional climate models. Some initial analysis of the completed runs has commenced and will be presented at the CORDEX 2013 conference. A dedicated Arctic-CORDEX meeting will be held on Friday 8th November at the end of the conference. Further details on the meeting can be found [here](#)

CORDEX Australasia

Contact: [Jason Evans](#)

CORDEX-Australasia is just starting to ramp up activities with several groups completing ERA-Interim driven simulations and moving on to produce simulations driven by CMIP5 GCMs. These simulations will complement a series of simulations that downscaled CMIP3 GCMs over the same CORDEX-Australasia domain. The recent introduction of a new supercomputer, and the establishment of a node of the Earth System Grid Federation at the National Computational Facility in Canberra, Australia, will greatly facilitate future CORDEX-Australasia simulations and the archiving and dissemination of CORDEX-Australasia simulations. While only a few groups are currently contributing simulations, it is hoped that more groups will consider contributing in the future. A series of CORDEX workshops that bring together relevant communities from South Asia, East Asia and Australasia are planned over the next few years.

Table 1: CORDEX-Australasia simulations **completed**, **underway** and **planned (X)**.

GCM	RCM (group)			
	CCLM (Institute of Coastal Research / Helmholtz -Zentrum Geesthacht, Germany)	CCAM (CSIRO, Australia) [& Queensland go- vernment]	WRF (Murdoch University, Australia)	WRF (3-member multi-physics en- semble) (University of New South Wales, Austr- alia)
ERA-Interim				
MPI-ESM-LR				
EC-Earth				X
HadGEM2-ES				
CNRM-CM5				
ACCESS 1.0				
CCSM4				X
NorESM1-M				
GFDL-CM3				
CSIRO Mk3.6				
ACCESS 1.3				X

MED-CORDEX

Contact: [Samuel Samot](#)

MED-CORDEX gathers 20 different modelling groups from 9 different countries in Europe, Middle-East and North-Africa. It includes 9 atmosphere RCMs, 8 regional ocean models and 12 coupled Regional Climate System Models. Evaluation runs use the ERA-Interim reanalysis as lateral boundary conditions. Historical and scenario runs use 6 different GCMs from CMIP5. More information on MED-CORDEX can be found at their [dedicated website](#).

In recent months, the metadata format has been decided and first data provider groups have described their runs (see [here](#)). The first observation-based gridded products; ocean temperature and salinity and sea level reconstruction; for Med-CORDEX model evaluation has also been provided to the [HyMeX database](#). Agreement about ocean output standard format has been achieved and ocean stand-alone runs, mostly in hindcast (evaluation) mode, have been carried out for the 1958-present or 1979-present period. The MED-CORDEX database includes around 30000 files for 1.1 Tb provided by 8 different institutes.

The MED-CORDEX community has presented at the HyMeX annual workshop, at EGU, to the French climate community (MISSTERRE project meeting), and will also present at the CORDEX 2013 conference. Some MED-CORDEX related articles from 2013 are listed below:

1. L'Heveder B. *et al* (2013) Interannual variability of deep convection in the Northwestern Mediterranean simulated with a coupled AORCM. *Climate Dyn.*, 41:937-960. doi: 10.1007/s00382-012-1527-5;
2. Nabat P *et al* (2013) A 4-D climatology (1979-2009) of the monthly tropospheric aerosol optical depth distribution over the Mediterranean region from a comparative evaluation and blending of remote sensing and model products. *Atmos. Meas. Tech.*, 6, 1287-1314, doi:10.5194/amt-6-1287-2013;
3. Ruti P. *et al* (2013) MED-CORDEX initiative for Mediterranean Climate studies (BAMS, in revision);
4. Stéfanon, M. *et al* (2013) Soil moisture-temperature feedbacks at meso-scale during summer heat waves over Western Europe. *Climate Dynamics*, 1-16; and
5. Trambly Y., *et al* (2013) High-resolution Med-CORDEX regional climate model simulations for hydrological impact studies: a first evaluation of the ALADIN-Climate model in Morocco. *Hydrol. Earth Syst. Sci. Discuss.*, 10, 5687-5737, doi:10.5194/hessd-10-5687-2013, <http://www.hydrol-earth-syst-sci-discuss.net/10/5687/2013/hessd-10-5687-2013.html>

CORDEX North America

Contact: [William Gutowski](#)

While groups in Canada, the U.K and France have performed CORDEX simulations for North America, there has been no organized multi-model U.S. effort to date. However, efforts are underway to develop and obtain funding for a U.S. program for North America CORDEX (NA-CORDEX). An NA-CORDEX planning committee has been holding teleconferences and meetings of opportunity at conferences, workshops, etc., to structure a U.S. program that promotes CORDEX goals and advances them further. The committee is co-chaired by Bill Gutowski and Linda Mearns and includes Joe Barsugli, David Behar, Gregg Garfin, Dennis Lettenmaier and Ruby Leung. The program would build on the regional climate modeling experience gained with NARCCAP but expand to include other modes of obtaining regional climate information, such as statistical downscaling and high-resolution global simulation.

There has been recent interest from U.S. federal agencies to support a workshop that will engage a broad spectrum of the climate and applications communities, including decision makers in various sectors, to review planning thus far and make recommendations for a program that would secure funding from multiple U.S. federal agencies. The workshop will examine potential goals for North America CORDEX:

- Assess the added value of downscaling for decision makers and other applications communities;
- Determine with statistical rigor levels of confidence in regional climate information;
- Develop a co-learning environment among its participants for producing the knowledge needed for applications of regional climate information;
- Identify key processes and climate-system sensitivities for North American climate change.

The workshop will review white papers supporting these goals to refine a program that both promotes CORDEX goals and satisfies identified U.S. national needs, thus providing a basis for financial support.

CORDEX South America & Caribbean

Contact: [Silvina Solman](#)

On September 11-13 2013 the Institute of Geophysics of Perú (IGP) held the WCRP VAMOS/CORDEX Workshop on Latin America and Caribbean (CORDEX LAC): Phase I - South America at Lima, Perú.



This training workshop was organised by WCRP in partnership with ICSU-ROLAC, the Inter-American Institute for Global Change Research (IAI) and the Caribbean Community Climate Change Centre (5Cs), and in collaboration with ICTP and CIMA. 70 participants from 19 countries attended the workshop, of which around 50% were early-career scientists.

The three-day Workshop identified regionally focused Vulnerability, Impact and Adaptation (VIA) on-going studies, and user knowledge needs in addition to on-going climate modelling activities within the CORDEX framework in the region.

The training activities were focused on developing a regional network from Latin America and the Caribbean communities, leading the participants to gain a deeper understanding of approaches for identifying vulnerability and risk, and developing skills in integrating and communicating climate related risk and the appropriate policy responses.

Full details of the Workshop and presentations are available [here](#) and information on the 2nd workshop can be found [here](#).

CORDEX South Asia

Contact: [R Krishnan](#)

The [2nd WCRP CORDEX South Asia Science and Technology Workshop](#), Kathmandu, Nepal, during 27-30 August 2013, was organized jointly by the International Centre for the Integrated Mountain Development (ICIMOD), World Climate Research Programme (WCRP), Asia Pacific Network (APN), Centre for Climate Change Research and Indian Institute of Tropical Meteorology (CCCR-IITM), Chinese Academy of Sciences (CAS) and Monsoon Asia Integrated Regional Study (MAIRS).

About 70 experts from 16 countries participated in the workshop. The deliberations of the workshop addressed important issues concerning regional climate change over South Asia and their potential impacts on water, food and energy. The workshop programme included (a) Scientific lectures (b) Training lectures on regional climate downscaling over South Asia (c) Hands-on training on analysis and applications of CORDEX South Asia regional climate data for sectorial assessments. The workshop focused on the following topics:

- Evaluation of monsoon climate simulations in Hindu Kush-Himalayan and Tibetan Plateau regions from multiple climate models (onset and withdraw, seasonal and intra-seasonal variability, flood, drought, heat wave etc.).
- Assessment of downscaling techniques and their products in Hindu Kush-Himalayan and Tibetan Plateau region to understand uncertainties accompanying the regional climate projections and to examine the feasibility of climate model results.
- Bridging the gaps between end users' needs and climate modeling communities, and meeting the requests of end-users (hydrology, agriculture, water resources, land cover and ecosystem, human health etc.) on downscaled products, with definition of data types, formats and resolutions, for vulnerability, impacts and adaptation analysis.
- Training of operational departments and local policy makers in South Asia and supporting local/regional policy making as well as sustainable development by providing user friendly regional downscaling products for South Asia.

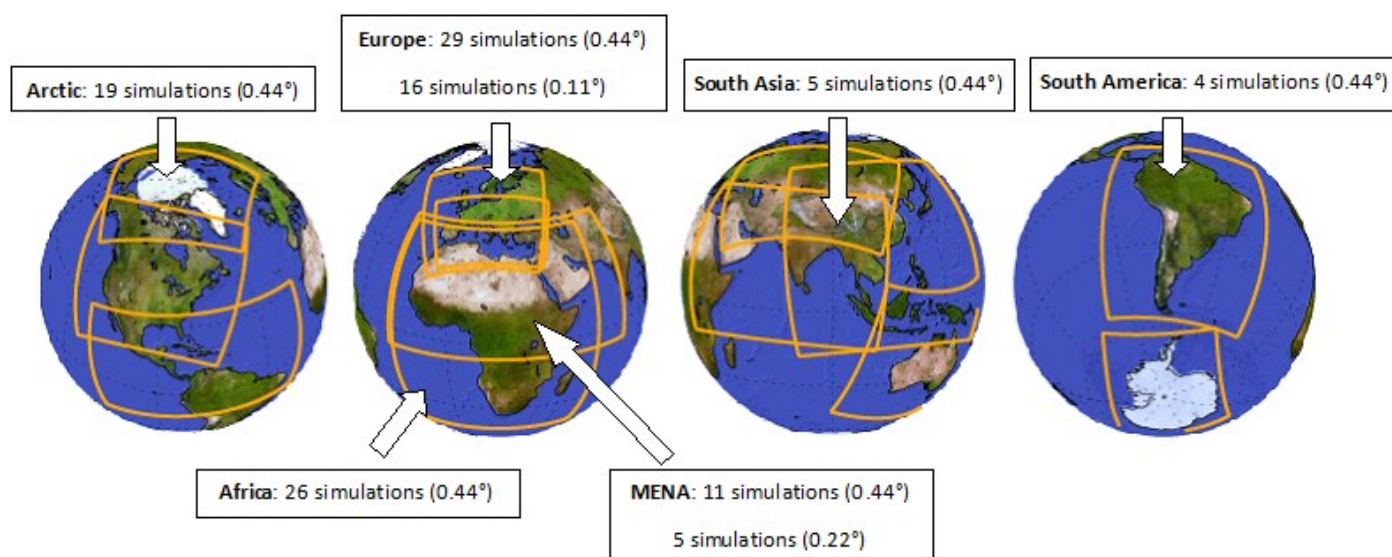


SMHI releases new CORDEX simulations

Contact: [Grigory Nikulin](#)

The Rossby Centre at SMHI has been heavily involved in CORDEX dynamical downscaling since 2010 by coordinating international regional modelling activities and producing regional climate simulations over various CORDEX domains. The full Africa-CORDEX ensemble (26 simulations) has now been already published on the [Swedish ESGF data node](#) and is freely accessible.

The latest version of the Rossby Centre Regional Climate Model - RCA4 has been used to downscale a subset of Global Climate Models (GCMs) simulations from the 5th Coupled Model Intercomparison Project (CMIP5). Future climate projections from nine CMIP5 GCMs, under both the RCP4.5 and RCP8.5 scenarios, have been downscaled in different combinations over 6 of 13 CORDEX domains: Africa, Europe, Arctic, Middle East and North Africa (MENA), South Asia and South America. The simulations (a total of 115) and the associated resolution are summarised in the image below.



Most of the Rossby Centre CORDEX simulations are performed at 0.44° resolution, recommended by the CORDEX experiment design to be completed first. For this reference resolution, the Euro-CORDEX ensemble (9 GCMs downscaled) and the Africa-CORDEX ensemble (8 GCMs downscaled) are the largest ensembles of transient (1951-2100) regional climate simulations ever produced by one regional model driven by different GCMs. In addition to the reference 0.44° resolution 5 GCMs were selected for downscaling over the Euro-CORDEX domain at unprecedentedly high spatial resolution - 0.11° and 2 GCMs for downscaling over the MENA-CORDEX domain at 0.22°. Such very high resolution simulations can provide more small-scale details necessary for impact and adaption studies at regional scales, for example in regions with complex topography and/or coastline.

In the coming weeks until the end of 2013 all Rossby Centre CORDEX simulations shown above will be published on the same data node. The publishing is possible thanks to support from the IS-ENES2 FP7 project and the published simulations are also visible, or will be visible, on other IS-ENES2 European datanodes: <http://esgf-data.dkrz.de/>, <http://esgf-index1.ceda.ac.uk>, <http://cordexesg.dmi.dk/> and <http://esgf-node.ipsl.fr>.

For further details on this release see the [Rossby Centre Website](#) or

contact Dr Grigory Nikulin grigory.nikulin@smhi.se

CORDEX Conference 2013



The programme for this exciting event has now been finalised and interactive version with dynamic links can be found on the [conference website](#). Around 700 participants have currently registered from 91 countries with WCRP providing support for 85 students, early career scientists and scientists from developing nations.

Registration remains open [here](#) and on site registration will be available although at an enhanced rate. Click on image (left) to download the latest conference announcement.

A number of [side events](#) will be held in the framework of the CORDEX 2013 conference week:

- [Arctic-CORDEX meeting](#)
- CORDEX-ASIA meeting
- CORDEX MENA-CA meeting
- JPI-Climate Workshop on future Paths for CORDEX and Climate Impact Research (invite only)

NEWS: Early Career Scientist Event

The CORDEX conference offers the participating Early Career Scientists (ECS) with an ideal platform for networking, exchanging ideas, developing collaborations, and gaining a sense of the steps required to build the CORDEX community. We hope to optimise their experience through a dedicated session that will take place on Tuesday 5th October at 12.30pm. The event is open to all Early Career Scientists (including students) and will provide the ECS with the chance to hear from some leading scientists from the CORDEX community, ask questions, and network with others (see programme below).

Time	Activity	Who
12.30-13.00	Introduction: welcome and objectives	Fernanda Zermoglio, Chile (chair)
	Presentation 1: 'Fellowship and mentorship: the CSAG experience'	Chris Lennard, South Africa
	Presentation 2: 'Building a career in climate science'	Colin Jones, UK
	Presentation 3: 'How to communicate with key target groups'	Chris Jack, South Africa
13.00-13.30	Question and answer session	Panel and all participants
13.30-14.00	Informal networking and lunch	All participants

The latest news on this event can be found on the [conference website](#) or by contacting [Eleanor O'Rourke](#) or [Roberta Boscolo](#).

CORDEX Empirical Downscaling Workshops

To date, progress in CORDEX has been largely on the basis of downscaling with Multi-GCM / Multi-RCM pairings. In contrast, Empirical/Statistical downscaling (ESD) methods are recognized as of equivalent skill with different advantages and shortcomings compared to using RCMs. However, ESD potential has not been explored as systematically as that of RCMs, creating a gap in overall assessment and applications of downscaling in CORDEX.



A sequence of three invitation-only ESD workshops of 2 days each is now in progress to close this gap and leverage the benefits of ESD to complement the RCM-based work. The workshop series is developing the core ESD comparison framework to evaluate and refine methodologies and engage stakeholders directly in co-exploration and utilization of combined ESD/RCM data archives. The first workshop took place on the 26th and 27th September 2013 at ICTP, Trieste, Italy (see group photo, left).

The workshops are bringing together scientists from all continents that are active in ESD to establish a standard framework of ESD activities that contribute to CORDEX and complement the equivalent

RCM product suite, and to build on existing climate downscaling activities for Africa. Included in this framework will be appropriate metadata for communicating downscaling output and metrics for evaluating it. Organizers are using previous CORDEX RCM activities involving both model analysis and stakeholder interaction to bring the ESD side of CORDEX to a level of engagement, assessment and utilization on par with the RCM effort. The workshop series will build a more cohesive community among the wide diversity of ESD practitioners, and establish a more rigorous foundation for the evaluation and uptake of ESD outputs by the scientific community and by stakeholders in Africa. The workshops will develop a multi-model, multi-method downscaling product complementary to the established CORDEX RCM design, and include additional diagnostics pertinent to ESD evaluation and tailored outputs targeted at needs of the adaptation and impacts communities.

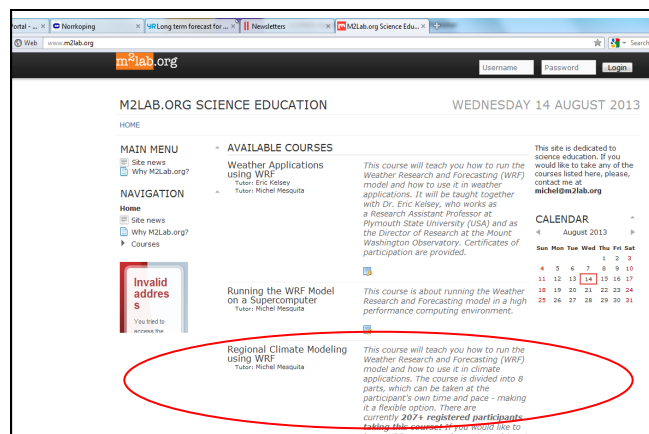
The ESD outputs will contribute directly to the broad range of other ongoing and proposed stakeholder-relevant adaptation and policy activities in developing nations, including those of various country aid agencies (e.g., UK DFID) and development agencies (e.g., World Bank). By advancing the role of statistical downscaling in CORDEX, the workshops will broaden the basis for analyzing climate downscaling and the provisioning of information for climate change studies in vulnerability, impacts and adaptation. The stakeholder participants will gain access to new climate-change information and increase their capacity to work knowledgeably with the information. The statistical downscaling participants will become more attuned to the needs and concerns of the stakeholder community through planning discussions of the first two workshops and the direct interaction afforded by the third workshop. The workshops will also strengthen the stakeholder impacts community in Africa that was established under previous activities. The workshops will thus provide a basis for sustained end-to-end analysis from climate change simulation to societal responses, one of the goals of CORDEX.

WRF Online Course Information

Michel Mequita, Head of Climate Outreach at Uni Climate, Bergen has created a Weather Research and Forecasting (WRF) online course, where participants learn how to run the model on their own laptops. We also discuss the CORDEX domain there and best practices when it comes to experiment design. There are currently 207+ registered participants from all over the world.

Feel free to invite others to attend our course. The registration process is free and can be completed as follows:

1. Visit our website at m2lab.org
2. Click on "Regional Climate Modelling Using WRF"
3. Select "Create New Account"



CORDEX People

The **Scientific Advisory Team (SAT)** is responsible for implementing and overseeing CORDEX to ensure it achieves its goals. The current members, and their responsible domains are;

Filippo Giorgi (co-chair)	MED
William Gutowski (co-chair)	North America
Bruce Hewitson	Africa
Won Tae Kwon	East Asia
R Krishnan	South Asia
Colin Jones	EURO, MENA
Silvina Solman	South America & Caribbean
Clare Goddard	Impacts

For those domains not represented by SAT members there are the following points of contact;

Jason Evans	Australasia
John Cassano	Arctic, Antarctica
Fredolin Tangang	South East Asia

The WCRP Joint Planning Staff contact is [Michel Rixen](#).

The CORDEX Communication & Outreach team are responsible for the CORDEX website, communication between the domains, and promoting CORDEX to those outside the community;

Roberta Boscolo (WCRP)	Catherine Michaut (IPSL)
Samuel Somot (CNRM)	Eleanor O'Rourke (SMHI)

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