Newsletter Issue 3 *January 2014*

CORDEX reached a major milestone when more than 400 scientists, all working on regional climate, came together in Brussels, Belgium, in early November 2013 for the 2nd International Conference on CORDEX. The conference was embedded in a wider event on Regional Climate jointly organized by the World Climate Research Programme (WCRP), the European Commission (EC) and the Intergovernmental Panel on Climate Change (IPCC). A summary of outcomes of the CORDEX conference can be found on p2. The conference week ended with four parallel regional side meetings kindly hosted by the European Commission: Polar-CORDEX; the Middle-East and North Africa (MENA) and Central Asia (CA) regions; eastern Asia regions; and a group focused on the European Joint Programming Initiative for Climate. Details of some of these meetings appear later in this issue (p3-4).

CORDEX opportunities increase as our community advances scientifically and tries to provide wider society with much needed robust climate information. CORDEX has grown to a size that now requires an international coordination office to manage its scientific and capacity building activities in all the regions, especially in the developing world. To that end, the WCRP offers a great opportunity for an institution to coordinate and support this exciting WCRP research initiative by hosting a dedicated CORDEX International Project Office (CIPO). A call for expressions of interest to host the CIPO has been issued. Deadline for submission is 31st March 2014 (for more details, see p6).

Last but not least, it is our pleasure to welcome new members on the CORDEX Science Advisory Team (CORDEX-SAT): Isabelle Anguelovski (UAB, Spain), Chris Lennard (UCT, South Africa), Grigory Nikulin (SMHI, Sweden), Tannecia Stephenson (UWI, Jamaica) and Bertrand Timbal (BoM, Australia). We would also like to thank warmly Colin Jones (SMHI, Sweden, now at the UK MetOffice), Bruce Hewitson (UCT, South Africa) and Clare Goodess (UEA, UK) for their exceptional contribution to CORDEX during their tenure.

For more information on CORDEX please see our website

Newsletter Contents

ICRC: CORDEX 2013 Summary

The ICRC: CORDEX 2013 conference reached and exceeded its ambitions. The first day of this important gathering featured a High Level Session with the participation of the EC Commissioners for Research & Innovation and for Climate Action, where the Intergovernmental Panel on Climate Change (IPCC) presented key findings from the Working Group I Contribution to the IPCC Fifth Assessment Report. This was followed by a Stakeholder Dialogue session focusing on how regional climate information can best serve the needs of policy and decision-makers. This segment provided important socio-economic and policy contexts that motivated much of the ensuing discussion during the CORDEX conference which brought together over 400 regional climate scientists.

Significant outcomes of discussions during the conference were several key challenges that CORDEX must address to better serve the vulnerability, impacts and adaptation (VIA) and other stakeholder communities. Participants recognized:

- the need to establish a two-way dialogue with the end users of regional climate information so as to ensure an appropriate tailoring of the CORDEX output to the decision makers' needs ;
- the demand for training activities that build capacity for interaction among practitioners, policymakers, scientists and other societal decision making groups;
- the importance of high-resolution observational data sets, and accessible model products to support evaluation of regional climate simulations; and
- the need for mechanisms to communicate scientific uncertainty in regional climate modeling and the implications that those uncertainties can have applying regional climate information to VIA studies.

A recurrent theme running through these challenges was the need to demonstrate rigorously the "added value" of the regional dynamical and statistical downscaling methods and thus the utility of CORDEX outputs.

The conference proposed several concrete actions for addressing these challenges:

- Revisit the CORDEX domains and develop a clear-science based procedure for their selections.
- Support the development of high-resolution observation datasets and archiving infrastructures such as the Earth System Grid Federation (ESGF).
- Develop metrics to assess the added value of the regional downscaling model outputs as compared to global climate simulations.
- Establish end-to-end pilot studies over selected sub-regions together with other WCRP regional initiatives and in partnership with the WCRP Working Group on Regional Climate.
- Review the multi-model multi-method matrix of simulations to ensure a robust characterization of climate uncertainties.
- Design and implement capacity building activities that bring together information providers and decision makers towards meeting regional needs.

The challenges are substantial, but the opportunities are stimulating as our community advances scientifically and responds to the important societal need for robust climate information.

For more information on the event, including webstreaming and photos, and the upcoming full conference summary please see the dedicated conference website here.

Arctic CORDEX Meeting

Contact: John Cassano

Representatives from different groups participating with simulations or interested in the analysis of Polar-CORDEX simulations attended a meeting at the EC following the ICRC: CORDEX 2013 conference. Each group provided an update about their completed and planned simulations and intended analysis. Some groups have indeed already completed ERA-Interim and GCM driven simulations.

Overall for Arctic-CORDEX, it is planned that there will be ERA-Interim-driven atmospheric RCM simulations from the following 9 models/groups by mid-2014: RCA4/SMHI, Sweden; CanRCM4/CCCma, Canada; CCLM/Univ. Trier, Germany; HIRHAM5/AWI, Germany; WRF/Univ. Colorado and Iowa State Univ., United States; WRF/Bjerknes Centre, Norway; HIRHAM5/DMI, Denmark; and RRCM/MGO, Russia. All groups will try to simulate the 1979-2010 period. For the climate projection simulations, Arctic-CORDEX will focus initially on RCP8.5 and make sure to end up with a good RCM-GCM matrix. Different specific modeling issues (horizontal resolution, nudging, stratospheric processes) were also discussed at the November meeting. We also discussed physical processes (e.g. atmospheric boundary layer processes, cyclones, clouds, marginal ice zone, polynyas) which are expected to show added value by these RCM simulations. A future plan is to set up coordinated coupled atmosphere-ice-ocean simulations for Arctic-CORDEX.

Two groups have run Antarctic-CORDEX simulations (KNMI, RACMO model, Netherlands; New Mexico Tech, WRF model, US) with another (LGGE, MAR model, France) interested in these simulations. In terms of process-based model evaluation, both the Arctic and Antarctic Polar-CORDEX activities are linked.

The Climate and the Cryosphere Project (CliC) office hosts the Polar CORDEX web page. This web page has just been set up and will be updated with a list of participating groups and models, completed and planned simulations, etc. as soon as possible. We have set up a mailing list to exchange information. Contact John Cassano or Annette Rinke to be added to this e-mail list.

Linking to the climate impact community

Contact: Ralf Döscher

CORDEX is a unique initiative for regional downscaling of global scale climate change simulations with a tremendous database and knowledge potential having been collected for use by the climate impact community. A JPI-Climate workshop held following the ICRC: CORDEX 2013 conference highlighted the need to advance the interface between the communities of regional climate downscaling and climate impact research. JPI Climate is a collaboration between 14 European countries to coordinate jointly their climate research and fund new transnational research initiatives (link to website). The need for a coordinated strategy was discussed, with continued improvements of climate models and more intense collaboration: for example through the joint exploration of climate simulations by the impact community and the CORDEX community.

The success of CORDEX in regionally interpreting climate change information needs to be complemented by integrated process-oriented case studies with improved models focusing on documented added value and user benefit in various sectors. This implies improvements in the complete value chain from better models to improved user value. There is a perceived need for further reduction of model biases, improved representation of extreme conditions and process descriptions, as well as for inclusion of directly user-relevant model components including oceans, cities, aerosol, vegetation, soil, permafrost, land hydrology and lakes.

Efficient exchange of knowledge and transfer of climate model data between the CORDEX and impact communities require the development of both better bias correction methods and a translator function to bridge the gaps in understanding, methods, and culture. Bias correction methods need to be explored and developed with respect to their effect on impact variables in a systematic effort, involving advanced statistics avoiding seasonal offsets, minimizing effects due to stationarity. Bias corrections of several variables must be carried out in an inherently consistent way, and need to be shaped and verified to drive extreme conditions realistically.

CORDEX MENA Meetings

Contact: Grigory Nikulin

CORDEX-MENA and CORDEX CA Joint Meeting

During the CORDEX 2013 conference, a number of posters and oral presentations demonstrated the first results from regional climate model simulations over the MENA- and CA-CORDEX domains. This was an especially encouraging result for the MENA domain which was officially recognized and included in the CORDEX domain list only in spring 2012. A number of side events, supported by the European Commission, were held in the framework of the CORDEX 2013 conference including the MENA-CA meeting. The main aim of the meeting was to summarize all completed and ongoing modelling activities in the MENA-CA domains and to discuss future activities across the various scientific communities involved. There is increasing interest in the first MENA-CA results and 15 scientists from different disciplines attended the meeting while more people were involved in MENA-CA related discussions during the conference.

An overview was given on existing regional climate simulations for both domains providing information about availability of the simulations; a large ensemble of the MENA simulations has been already published in open access via ESGF. Evaluation and analysis of the MENA-CA simulations were discussed in detail including observational data sets, definition of sub-regions and metrics for evaluation of RCMs. A few examples of impact studies focusing on human health and vulnerability were also presented. The meeting provided a good opportunity for interaction across different climate and impact modelling groups contributing to rising awareness of the MENA-CA CORDEX activities. One of the main outcomes of the meeting is involvement of more climate modelling groups planning regional simulations in the MENA domain, which is crucial to extending the MENA-CORDEX ensemble.

CORDEX-MENA 5th Expert Group Meeting

The CORDEX-MENA domain was established as a central component of RICCAR (*Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region*). As part of this ongoing initiative, the 5th "Expert Group Meeting" was held in Amman, Jordan, 11th-12th Dec 2013. Focus of the meeting was to review progress to date for regional climate modelling over CORDEX-Mena domain and how the regional projections will be used toward assessing impacts on water resources. To date, 13 regional climate projections have been completed and a number of additional projections are underway.

Further processing of the projection results into hydrological impacts models is a key component of RICCAR. Other components include vulnerability assessment, and establishment of both a regional knowledge hub and a regional climate outlook forum (RCOF). The meeting was organised by UN-ESCWA (Economic and Social Commission for Western Asia) and the League of Arab States; attending were participants from 14 Arab countries, 6 UN organisations, 5 research institutes and 3 regional organisations.

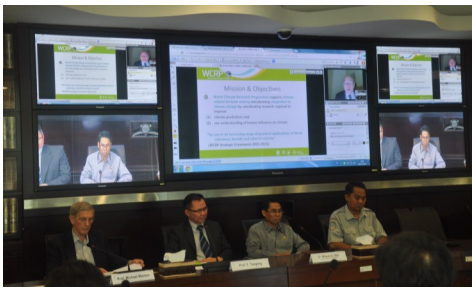
Please find relevant links below:

- http://www.escwa.un.org/RICCAR/ri.asp?ReferenceNum=RI (overall RICCAR initiative)
- http://www.escwa.un.org/RICCAR/sida.asp?ReferenceNum=Sida (direct to Sida-Project where SMHI has a leading role)

NEW DOMAIN: South East Asia CORDEX

Contact: Fredolin Tangang

Group photo of participants



Michel Rixen of WCRP addresses participants via Skype during the opening session

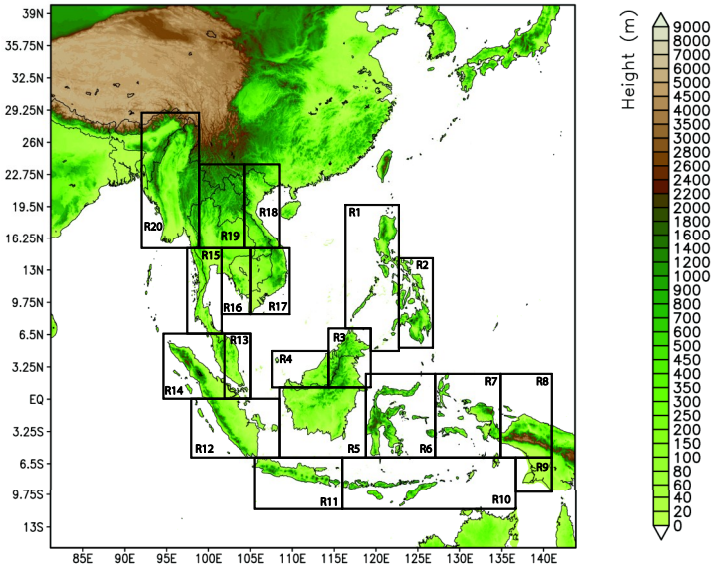
The first workshop of the Southeast Asia Regional Climate Downscaling (SEACLID)/CORDEX Southeast Asia (SEACLID/CORDEX-SEA) was successfully held on 18th-19th November 2013 in Jakarta, Indonesia hosted by the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG). The main objective of this workshop was to formulate an agreement among SEACLID member countries and potential collaborators on how to implement SEACLID/CORDEX-SEA activities. Participants from Indonesia, Malaysia, Thailand, Vietnam, the Philippines, Singapore, UK, Australia, South Korea and Hong Kong took part.

The workshop was led by Dr. Widada Sulistya, Deputy Director General for Climatology of BMKG, who acknowledged the need for scientists from within the region to work together and build capacity in regional climate downscaling, and praised the establishment of SEACLID/CORDEX-SEA. Dr Michel Rixen of WCRP, who addressed the participants via Skype, provided an overview of WCRP and CORDEX activities and was enthusiastic about the ongoing collective initiative within this region.

A total of seventeen presentations were made covering aspects of regional modeling activities within the SEACLID/CORDEX SEA region and the results of RegCM4 sensitivity experiments for best physics options over SEACLID/CORDEX-SEA domain. In addition, a discussion on various issues related to implementation of SEACLID/CORDEX-SEA took place.

Country	No of GCMs	RCM	RCP4.5	RCP8.5
Indonesia	1	RegCM4	?	?
Malaysia	3	RegCM4	?	?
Vietnam	1	RegCM4	?	?
The Philippines	1	RegCM4	?	?
Thailand	1	RegCM4	?	?
Australia	3	CCAM		?
UK	1	PRECIS2	?	?
South Korea	1	WRF	?	?
Hong Kong SAR	1	WRF	?	?

Table 1: Pledged commitments by countries involved in SEACLID/CORDEX-SEA



Map1 (above): CORDEX-SEA domain map

The workshop achieved its objective, in that an agreement was reached where thirteen GCMs (detailed in Table 1) will be downscaled to a resolution of 25km on the SEACLID/CORDEX-SEA domain. Currently the sensitivity experiment is ongoing and expected to be completed in the next few months well before the second workshop in June 2014, which will be hosted by Thailand.

Call for expression of interest

CORDEX International Project Office

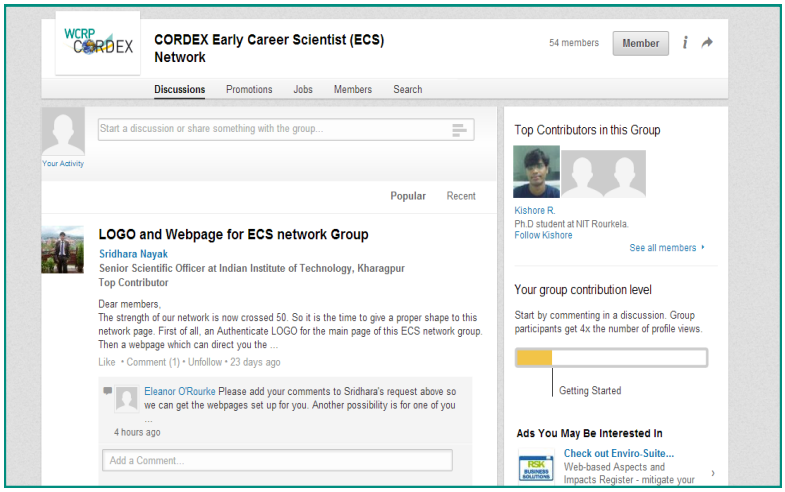
The need for a CORDEX International Project Office (CIPO)

CORDEX has grown to a size that now requires an international coordination office to manage its scientific and capacity building activities (e.g. support to conferences, workshops, training sessions, schools and fellowship programs) in the CORDEX regions, especially in the developing world. To that effect, WCRP offers hereby a great opportunity for an institution to coordinate and support this exciting WCRP research initiative in the form of hosting a dedicated CORDEX International Project Office (CIPO). A call for expressions of interest to host the CIPO has been issued. It is anticipated that the designation of the CIPO will last for an initial period of five years with subsequent renewal if appropriate. Interested institutions are invited to note the Terms of Reference outlined in Annex 1 of the application documents and to return detailed answers to points listed in Annex 2 **no later than 31st March 2014** to Michel Rixen via email at mrixen@wmo.int. All offers to host the CIPO will be examined carefully and the selection will be based on scoring the adequacy of criteria outlined in Annex 2, which can be complemented by additional relevant information as appropriate. Any questions regarding this call can be forwarded to the above email address.

For more information and the full application documents for those interested in hosting the CIPO see here

Early Career Scientist Network

After the success of the Early Career Scientist (ECS) event at ICRC: CORDEX 2013 it was clear that there was interest in developing a network of ECS involved in CORDEX and other regional climate activities. This type of initiative must be driven by the ECS' themselves and therefore the CORDEX communications team released an informal call for volunteers to initiate the network and take some first steps. Enthusiastic responses were received including Sridhara Nayak (right) who is currently working on regional climate over the South Asia CORDEX domain at the Indian Institute of Technology, Kharagpur, India. Sridhara has set up the CORDEX Early Career Scientist (ECS) Network group in Linkedin and is taking the lead to communicate relevant information and discussions among the group members. It is hoped that the ECS Network will continue to grow and develop providing a platform for the participants to network, find information on job and grant opportunities, share knowledge, and become involved in outreach activites across the globe.



Want to find out more?

If you would like more information on the CORDEX ECS Network please contact:

Sridhara Nayak (ECS representative)

or

Eleanor O'Rourke

Roberta Boscolo

WCRP and CORDEX at the 3rd International Conference on Climate Services

The WCRP Working Group on Regional Climate (WGRC) organized a side event with the focus on CORDEX at the 3rd International Conference on Climate Services that took place in December 2013 in Montego Bay, Jamaica. The event titled "*Regional climate modeling and robust foundations for climate services: What does the CORDEX initiative have to offer climate service providers and users*?" was designed as an opportunity to inform those in the climate-services community about the CORDEX initiative. In the incoming months it is anticipated that many terabytes of CORDEX data will become available online and in this context WGRC recognized the importance of setting expectations and context by informing potential users on the design of the regional downscaling experiments as well as broader CORDEX activities and plans (link).

In particular, the presenters offered some practical examples on how to build around CORDEX activities, regional networks of climate modellers, and climate service providers and users, including the example of the Caribbean and South America. Bruce Hewitson, WGRC co-chair, gave an overview of an 18-month capacity building program using RCM analysis in Africa. The African regional teams analyzed the outputs from RCMs, GCMs, and SDS, and looked at how to handle contradictions between the models. Considerable effort was devoted to "distilling" the variety of information streams in order to provide useful information to user communities.

Felipe Lucio from WMO stressed the importance of the research community for the implementation of the Global Framework for Climate Services (GFCS). The recent Africa Climate Conference (link) held in Arusha, Tanzania, in October 2013, was highlighted as an example where scientists and practitioners agreed on a coordinated regional climate research agenda for development.

GFCS welcomes the CORDEX efforts towards reducing the gap between science products and service-oriented climate information. Finally Felipe listed some GFCS research priorities where a great synergy with the CORDEX community is anticipated such as the characterization of uncertainties in climate information for risk management, adaptation and mitigation decisions, and research on attribution and prediction of extreme events at regional level.

The side event provided a space for dialogue and inputs from the climate services community on research priorities in support of climate services with a special focus on CORDEX regional downscaling experiments. While acknowledging the major achievements of CORDEX, there was a strong desire to see CORDEX move beyond a 'simple' model intercomparison project. Several pressing needs and gaps emerged from the discussion, including the need to:

- develop tools for analysis, evaluation and comparison of model outputs and share them across the CORDEX domains;
- develop and make available high-resolution observational data sets;
- improve stakeholder engagement, focusing on problem solving and co-exploration, for example, in the context of the sectoral and regional data and decision support systems;
- reduce the gap between scientists and users of CORDEX data;
- work with intermediary organizations and social scientists who can help translate user needs into research questions;
- raise awareness of the important climate issues for decision-makers;
- recognise that more than data dissemination is required. Data are not information although the science community tends to present their model data as if they are ready to use. Climate *information* needs to be generated from the data and made available; and
- consider downscaling of seasonal forecasts and decadal predictions.

Contact information

CORDEX People

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

Filippo Giorgi (co-chair)

William Gutowski (co-chair)

Isabelle Anguelovski	Tannecia Stephenson
Won Tae Kwon	Betrand Timbal
R Krishnan	Grigory Nikulin
Chris Lennard	Silvina Solman

In addition to the SAT members there are also additional contact points as following :

Jason Evans	Australasia
John Cassano	Arctic/Antarctic
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)

CORDEX is a WCRP Project sponsored by:

World Climate Research Programme

WMO IOC ICSU International Council for Science