



Criteria for Selecting and Updating CORDEX Domains

Domains receiving an official CORDEX designation should satisfy a set of criteria, discussed below. Any application for a new CORDEX domain should address each of these. The CORDEX Science Advisory Team (SAT) will review applications and give approval if the application satisfies all criteria. Updates of domains should also be reviewed and approved by the CORDEX SAT.

1 Scientific relevance

Describe scientific relevance of the domain. Why is it so important to establish the domain proposed? What information can be accessed from existing CORDEX domains and what not? Is higher resolution required? Is coupling additional models (e.g., ocean or lake model) required?

A domain should have specified physical processes that are important for the region's climatology. These processes should have time and space scales that regional downscaling can handle well and which are not well resolved in coarser resolution models. Typically, they will be mesoscale or smaller processes.

There should be a set of scientific questions posed that downscaling for the domain will address. Among these should be questions addressing the potential added value to GCM output from downscaling.

2 User needs

A domain should have needs, such as for VIA (Vulnerability, Impacts and Adaptation) assessments, that will benefit substantially from downscaling of the region's climate. An application should identify a community of users for the downscaling. Provide information about potential users of downscaled climate information in the region. Who is going to use downscaled climate information (international and regional agencies, private companies, local authorities, etc.)?

Ideally, these users have participated in formulating some of the scientific questions.

3 Capability requirements

Capability requirements are twofold. First, there should be an assessment of the computing resources needed to perform downscaling for the domain according to CORDEX specifications (e.g., resolution, time periods and scenarios). Are there enough resources to a run reasonably large number of climate simulations with the domain configuration proposed? How many evaluation and climate change simulations may be expected?

Second, how many groups have been involved in configuring the domain? The domain should engage a community of researchers that has the resources to perform the downscaling. The community should consist of at least three institutions and at least three different RCMs.

4 Configuration of the domain

Provide parameters of the domain proposed in terms of a rotated polar coordinate. This includes identifying the region, boundaries, resolution and number of grid points within the free domain



(once the relaxation/nudging zones have been removed), which should be minimally covered by the simulations. Also provide the 8 bounding points that provide guidance to those using other projections. See for example the [parameters for the existing CORDEX domains](#). Provide suitable sub-domain to allow for the straight comparison of dynamical and statistical downscaling approaches.

5 Sensitivity studies performed

Describe what sensitivity experiments have been performed to determine domain configuration. How does the downscaled climate depend on the domain size and resolution? How many domain configurations have been tested? Sensitivity studies of possible domain configurations should ensure that the issues in items 1-4 above are addressed well.

Has input from users of downscaled climate information been used in developing domain configurations?

Sensitivity studies should address the capability for properly accounting for large-scale features such as storm tracks and teleconnections. Did the sensitivity experiments help to determine which physical and tuning parameters (surface parameterisation, convection, radiation and clouds) are better to simulate regional climate more accurately?

6 Contact details

Applications to initiate new domains should be sent to the International Project Office for CORDEX (IPOC) at eleonor.orourke@smhi.se