

Flagship Pilot Studies: Criteria, Guidelines and New Reporting Requirements

1. INTRODUCTION

During the International Conference on Regional Climate – CORDEX 2013, a number of scientific challenges emerged including the need for:

- More rigorous and quantitative assessment of the added value of regional downscaling;
- Better understanding of processes and phenomena relevant for regional climate change;
- A broader and more process-based assessment of downscaling techniques and models;
- Better integration of Empirical-Statistical Downscaling (ESD) within the CORDEX framework;
- Moving towards very high resolution, convection permitting models;
- Development of coupled regional earth system models, in particular including the human component (e.g. urbanization, dams, pollution emissions, adaptation etc.)
- Assessment of the effects of regional forcing, such as land-use change and aerosols;
- Distillation of actionable information from multiple sources of downscaled projection information; and
- Better integration of CORDEX with other WCRP programs (e.g. GEWEX)

In these discussions it was recognized that addressing these scientific challenges might be problematic within the general CORDEX framework (details of which can be found on the [CORDEX website](#)) that employs standard sets of simulations for large domains often encompassing entire continents and surrounding regions. The idea thus emerged to develop more targeted experimental setups, called “Flagship Pilot Studies (FPS)”, which would enable the CORDEX communities to better address a number of the challenges outlined above.

The FPS would focus on sub-continental-scale targeted regions, so as to allow a number of capabilities towards addressing key scientific questions motivated by several issues:

- Run RCMs at a broad range of resolutions, down to convection-permitting;
- Promote side-by-side experimental design and evaluations of both statistical and dynamical downscaling techniques at scales more typical of VIA applications;
- Design targeted experiments aimed at investigating specific regional processes and circulations;
- Investigate the importance of regional scale forcings (aerosols, land-use change, vegetation etc);
- Compile and use high quality, high resolution (both spatial and temporal), multi-variable observation datasets for model validation and analysis of processes;
- Coordinate with specific activities in other WCRP projects, most notably the GEWEX regional hydroclimate projects;
- Design end-to-end, climate-to-end-user, projects demonstrating the actionable value of downscaled climate change projections;

- Increase the potential for funding by focusing on specific issues of interest for a certain region

In subsequent discussions, the CORDEX Scientific Advisory Team ([CORDEX-SAT](#)) recognized that, due to their very nature, FPSs cannot be conceived in general terms but should be driven by the regional CORDEX communities, although sharing common protocols so as to allow easier exchange of know-how. The SAT thus envisions a mechanism of solicitation of FPS proposals to be submitted by the regional communities and assessed by the SAT, with the aid of external experts, for formal CORDEX endorsement. This document serves to provide guidelines to enable these groups to develop FPS proposals for review and endorsement by the CORDEX SAT according to the criteria listed below.

2. CRITERIA

Applicant groups should ensure that their proposal meets all the criteria in the ‘Essential’ column and should take into consideration the ‘Highly recommended’ criteria as relevant to their goals of their proposed study.

Criteria	Essential	Highly recommended
1 Targeting fine scale processes and clear scientific questions of interest (e.g. see list above)	<ul style="list-style-type: none"> • Not addressed by GCMs or coarser resolution downscaling • Have potential to demonstrate the added value of downscaling • Not addressed within the existing standard CORDEX framework. 	<ul style="list-style-type: none"> • Can be usefully approached by both dynamical and statistical downscaling methods, so as to allow an intercomparison of the approaches • Investigate regional processes, circulations and forcings of interest.
2 Use of observational data including not only meteorological but also derived data (e.g. soil moisture, streamflow etc.)	<ul style="list-style-type: none"> • Studies should be based upon data of sufficient quality to support the objectives. 	<p>The observation data should enable the capability to:</p> <ul style="list-style-type: none"> • Investigate regional processes • Validate dynamical models down to convection permitting resolutions and sub-daily scales • Provide information suitable to calibrate and validate statistical downscaling tools • Enable cross analysis and validation of multiple variables, processes, feedbacks and interactions across climate system components
3 End-to-end perspective and potential to support demonstrated local/regional needs	<ul style="list-style-type: none"> • Impact of the study from the physical science and/or VIA viewpoints (whether near or long term) should be evident. 	<ul style="list-style-type: none"> • Stakeholder needs determined by the interactions with VIA community or existing literature on the topic. • Potential to generate funding support • Potential to produce actionable climate information

4 Applicant group	<ul style="list-style-type: none"> • Multiple participants must be involved in the study. 	<ul style="list-style-type: none"> • Transnational and multidisciplinary applicant groups are encouraged.
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3. EVALUATION PROCEDURE

- Step 1:** Submission of completed FPS proposal to International Project Office for CORDEX (IPOC)
- Step 2:** IPOC provides preliminary assessment (application has been completed correctly and all information has been provided).
- Step 3:** IPOC sends application to relevant external review panel relevant to application focus (CORDEX Points of Contact, representative of WCRP projects, Future Earth, GFCS and other as relevant).
- Step 4:** External reviewers complete their evaluation and submit report to IPOC.
- Step 5:** CORDEX-SAT make a final decision; those SAT members involved in any applications will not be included in associated decisions.
- Step 6:** IPOC informs applicant of outcomes and provides guidance for successful applications.

4. REPORTING REQUIREMENTS and GUIDELINES

1. A written annual report on the status and progress of the FPS is to be submitted to the International Project Office for CORDEX (IPOC). The report is due 15th of February each year and will be posted on the CORDEX website. In addition the annual report is to be presented during one of the teleconferences of the CORDEX SAT.
2. Each FPS should report at all ICRC CORDEX Conferences in the lifetime of the project.
3. Each FPS will be assigned to a CORDEX SAT member who has the primary responsibility for reviewing project reports.
4. Each FPS should maintain a website to update community on lessons learnt and major outputs of the project.
5. An FPS should last no longer than 5 years. At this time short-term extensions may be applied for in order to complete final tasks. Thereafter projects that wish to continue will need to be recast with an application to be a new FPS under revised goals and direction.
6. Any FPS that fails to meet these requirements, including the provision of annual reports, for two consecutive years will be considered inactive and unendorsed as an FPS.