

Interactive comment on “WCRP COordinated Regional Downscaling EXperiment (CORDEX): A diagnostic MIP for CMIP6” by William J. Gutowski Jr. et al.

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The central concern of the reviewer is the greater emphasis on dynamical downscaling versus empirical statistical downscaling (ESD) in the CORDEX2 plans as delineated in the GMD paper. We agree that ESD needs to be more strongly a part of CORDEX, and efforts have been underway to promote ESD in the CORDEX framework. We have included ESD in the CMIP6 planning for CORDEX as a Diagnostic MIP, especially in the output request, which was tailored to cover both RCM and ESD needs. We have modified the paper at several locations to make this point clear, either by explicitly mentioning ESD (lines 106-109, 147-148, 291, 297 and 358-360 of revised manuscript) or changing places where we used “RCM to “RCD” (e.g, lines 257, 289 and 293); the

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latter includes both types of downscaling, as we have made clear in the first part of the paper.

We have also noted that ESD can bring a variety of techniques to bear on producing climate information for regions and the value of the extra tools ESD brings for addressing additional matters such as bias correction and added value (lines 147-148). We do note, though, that the purpose of the paper is to describe CORDEX in the context of CMIP6, and going deeply into methods and outcomes of assessing added value or bias correction is beyond the intended scope of the paper. We have, however, cited several papers that go into details of added value and bias correction.

The reviewer suggests we start with specific science questions under different WCRP grand challenges. Because this paper is about CORDEX as a CMIP6 Diagnostic MIP, we have focused more on where CORDEX contributes to key science needs as outlined by CMIP leadership. However, the CORDEX Science Advisory Team did develop its regional science challenges partly with the WCRP challenges in mind, and we do refer to the primary WCRP challenge addressed by CORDEX: climatic extremes. These regional science challenges are also presented as the basis for the development of the CORDEX2 framework. We further recognize that the WCRP grand challenges are undergoing their own revision. In particular, the regional information grand challenge no longer exists, though there is substantial discussion occurring on the role of the WCRP for undertaking the science to provide needed regional information. The text has been modified on lines 331-332 to reflect this evolution. We have noted, though, that the CORE framework would produce output that should be amenable to addressing such concerns.

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