Future directions for modeling regional climate variability and change

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This presentation will review the main techniques used for the regionalization of simulated climate data. By this we mean techniques that bring more detail and accuracy (spatially and/or temporally), over a limted geographic region, to simulated data from Global Climate Models (GCMs). The same techniques may, and preferably should, also increase the usefulness of this data for user groups local to the target region. We highlight a number of successful activities in this area, drawn from different regions of the world and addressing different timescales, e.g. from seasonal prediction to centennial timescale climate chan ge. In doing this we wish to highlight important do's and don'ts related to the regionalization and subsequent use of GCM climate data. We discuss the main factors presently limiting the generation of high-quality, useful regional climate information and outline priority areas for future research and development. We introduce a number of new coordinated activities in the area of modeling regional climate variability and change, in particular the WCRP-sponsored CORDEX initiative. CORDEX acts to coordinate international downscaling activities linked to CMIP5, in order to produce a set of standardized matrices of regional climate data, for land-regions worldwide, that sample a significant fraction of the uncertainty space inherent in such endeavors. We present some early results from CORDEX, both with respect to modeling regional climate variability and the use of such downscaled data in a number of impact assessment projects. Finally, we discuss the potential role of CORDEX, and the large group of contributing scientists, in the provision and subsequent use of regional climate information in projects of high societal importance.