

Linking regional climate simulations with impact modeling over Africa: Examples from human health and food security

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CORDEX (The Coordinated Regional Downscaling Experiment) coordinates the use and development of regionalization methods within WCRP. CORDEX aims to generate a number of multi-GCM, multi-downscaling method, matrices of regional climate change projections for land-regions worldwide, with Africa being a priority region for coordinated activities over the coming few years. CORDEX also has an important role to play in supporting the use of regional climate simulations in impact, adaptation and vulnerability (IAV) studies, which are often carried out at the sub-continental to national scale. We present some early results from two CORDEX-IAV collaborative efforts, focussing respectively on (i) climate and malaria risk and (ii) climate and food security over Africa. In the first example, an ensemble of CORDEX Regional Climate Model (RCM) simulations are used to drive the University of Liverpool dynamic malaria model, with an aim to assess the impact of climate variability and change on future risks for malaria incidence, epidemic transmission and spatial extent over Africa. In the second case, the World Food Programme Africa RiskView tool is driven by the same ensemble of RCM simulations to investigate links between regional climate variability and change and the potential costs of livelihood protection in response to changing drought incidence. In both cases we highlight the importance of; (i) utilizing an ensemble of RCM simulations and regional climate change estimates, (ii) carefully evaluating the representation of the recent observed past, in terms of both regional climate variability as simulated by the RCMs and the response to this variability in the respective impact models. Finally, we present some preliminary findings on the benefits of increasing RCM resolution, from the CORDEX-standard of 50km, through 25km to 12.5km, with respect to simulated regional climate variability over Africa and the downstream impacts on malaria risk and food security.