

EGU21-5319

<https://doi.org/10.5194/egusphere-egu21-5319>

EGU General Assembly 2021

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Modelling the Southeast African regional Climate

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The aim of the Flagship Pilot Study (FPS) “Modelling the Southeast African regional Climate” is to study processes and phenomena relevant to regional climate change in south-eastern Africa. The region is vulnerable to climate change due to socio-economic factors as well as its exposure to weather and climate extremes such as floods, droughts and heat waves. The FPS will foster regional collaboration on modelling and the analysis of precipitation and temperature that will be beneficial for the society in general. The FPS South-eastern Africa includes various scientists from the National Meteorological and Hydrological Services (NMHSs) and academia of South Africa, Mozambique, Zimbabwe, Malawi, Tanzania, Kenya, Rwanda, Burundi and Norway. The research will involve analysis of local observations, reanalysis, simulations from regional climate models (RCMs) and empirical-statistical downscaling (ESD) to study dependencies between large-scale conditions and local variability in the rain and temperature statistics. The expected impacts of the FPS are skills development in data analysis and modelling, and a better understanding of regional climate that is fundamental to climate services and provides guidance to decision-makers and planners. The involvement of NMHS in the project provides access to their observational networks, whose use will assist with verification of model simulations, and also increase the value of NMHSs’ work with observations and data management. Actionable information will be extracted for decision-makers, based on a synthesis of multiple sources of information which take into account the local climate, past and future trends, models’ skill, known weather/climatological phenomena, and other geographical information. Biases between the model climate and observations will be adjusted through appropriate adjustment methods such as the Quantile Mapping approach. The work will also involve capacity building on R programming language as well as other tools (e.g. CDO, python) and use R-based shiny web applications in distillation efforts and to provide a gateway to the information embedded in complex data structures.