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Dynamic downscaling of CMIP6 model outputs: usage of the Lengau Cluster by the Agrometeorology division of Agricultural Research Council

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The Agrometeorology division of the Agricultural Research Council represents a research group focused on weather and climate in relation to agricultural activities. One aspect of the group's activities is to investigate how climate change could impact agricultural activities, focusing on smallholder to large-scale commercial farming activities. To understand the future effects of climate change for consideration in agricultural decision-making, Global Climate Models (GCM) can provide us with climate change projections, which represent potential future climate scenarios. However, GCMs have very coarse spatial resolutions (around 100 x 100 km or more), which are not appropriate to apply for decision-making in agriculture. Therefore, to guide agricultural decision-making across South Africa, the Agrometeorology division has begun dynamically downscaling GCM outputs from selected models contributing to the sixth phase of the Coupled Model Intercomparison Project (CMIP6). For this task, we are utilising the Weather Research and Forecasting (WRF) model to downscale GCM outputs to an 8 x 8 km spatial resolution for a range of future scenarios (i.e., SSP1-2.6, SSP2-4.5, and SSP5-8.5). To undertake this massive computing task, the division relies very heavily on the computing resources offered by the Centre for High Performance Computing (CHPC) Lengau Cluster; without these resources, this dynamic downscaling task would not be possible. Thus, in presenting this work, I will highlight just how significant and valuable the CHPC resources are for our work, and I will share on our progress (with some results), challenges, and successes to date.

Student or Postdoc?

No. Not a student nor Postdoc.

Primary author: Dr ROFFE, Sarah (Argometeorology Division, Agricultural Research Council – Natural Resources and Engineering, Pretoria, South Africa)

Presenter: Dr ROFFE, Sarah (Argometeorology Division, Agricultural Research Council – Natural Resources and Engineering, Pretoria, South Africa)

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