Assignment for PhD interview: Evaluating the simulated latent heat flux by RCA-GUESS

As an Earth system modeller, you have recently enhanced the land-atmosphere coupling of an Earth system model by integrating a new dynamic vegetation module. The new model is called RCA-GUESS. You want to check if RCA-GUESS has a good performance in simulating land surface heat fluxes and the overall climate.

For this assignment, you have been provided with two simulated variables from RCA-GUESS: surface upward latent heat flux (hfls) and precipitation (pr). They are on a monthly basis, covering the period from 2016 to 2020. The respective files containing the data are named as follows:

- hfls_AFR-44_CanESM_VegFB_v2_SMHI-RCA4_v1_mon_201601-202012.nc
- pr_AFR-44_CanESM_VegFB_v2_SMHI-RCA4_v1_mon_201601-202012.nc

More information about these two variables (e.g., unit, coordinates, etc.) can be obtained in these two files themselves (you can use ncdump to check the NetCDF files). These two variables are extracted from the vegetation feedback simulation of RCA-GUESS, driven by CanESM. More details regarding the simulation and model setup can be found in the paper https://esd.copernicus.org/articles/7/627/2016/esd-7-627-2016.pdf

Based on the provided materials, please address the following questions:

- How well does RCA-GUESS simulate latent heat flux in Africa? Support your argument by comparing the simulations with relevant observational datasets.
- What are the potential processes that contribute to the biased simulation of latent heat flux? Explain the possible reason behind these biases.
- Describe how the biased simulation of latent heat flux could impact the simulated climate in Africa.

Please prepare your answers to these questions in a Powerpoint file, which should include the results and description that you wish to present during the interview. The submission deadline for this assignment is 23:59, 26th, May (CEST). Thank you for your participation, and I look forward to discussing your finding in the interview.

Good luck!

Best wishes
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