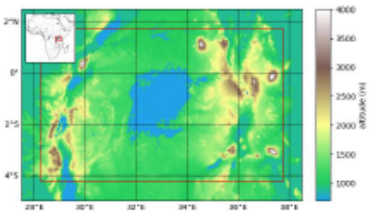
Project: 1111
Title: KIT-ELVIC – Climate Extremes in the Lake Victoria Basin
Report for period 01.07.2022 - 30.06.2023

During the application period 07/2022 – 06/2023, the focus was (i) on further evaluation and post-processing of the ERA-Interim driven control run within KIT-ELVIC and (ii) to start new ERA5 driven runs for present day for comparison with the envisaged pseudo global warming (PGW) experiments in the next allocation period (07/2023 – 06/2024). KIT contributed to the CORDEX-FPS-ELVIC project with a dynamical downscaling approach using the regional climate model WRF to achieve the overall project aims: the generation of a high-resolution (3 km grid spacing) convective permitting multi-model ensemble over the Eastern African Lake Region with a specific focus on the Lake Victoria to analyze the regional climate over this vulnerable region.

The first paper showing the results of the continuous 10-year run with the WRF model (driven by ERA-Interim) at high resolution (2.8 km grid spacing) in comparison with the results of the other modelling groups as well as a validation of the high-resolution model ensemble with observational datasets has been published in Climate Dynamics. As the ELVIC team agrees to aim for a PGW-approach based on CMIP6 climate change signals imposed to ERA5 data, an additional ERA5-based evaluation run (2.8 km grid spacing) is currently produced. For the next application period, we plan to conclude the project by running the envisaged PGW runs for the end of this century (see application for computing time within the project 1111 for 07/2023 – 06/2024).

The following Figures give an overview (Fig. 1) of the ELVIC project and some results of the modelling activities within this project.

Model	Institute	Timing	Driver	Coarse resol	Fine resol	Lake model
CCLM	KUL	2005-2015	ERA-Int	12 km	2.8 km	Flake
CCLMe5	KUL	2005-2015	ERA 5		2.8 km	Flake
ALADIN-AROME	SMHI	2005-2015	ERA-Int	12 km	2.8 km	Flake
RegCM	ICTP	2005-2015	ERA-Int	25 km	3.0 km	Hostetler
WRF	KIT	2005-2015	ERA-Int	12 km	2.8 km	Flake
MO-UKV	MO	1997-2007	HadGEM	25 km	4.0 km	



Topography map of the Lake Victoria region, indicating the agreed coarse (12 km) and high (2.8 km) resolution domains.

Figure 1: Overview of participating institutes and considered regional climate models over the model domain with focus over the Lake Victoria.

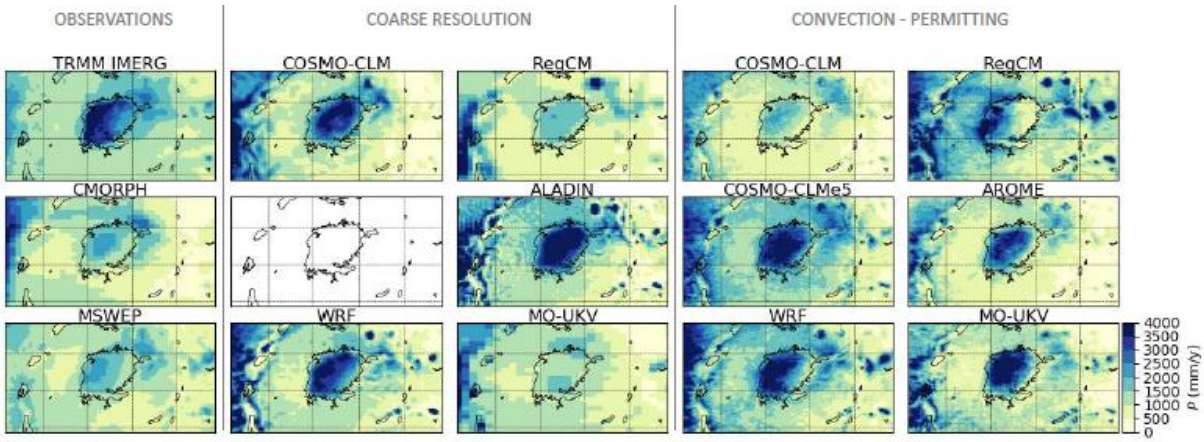


Figure 2: Comparison of observational precipitation data sets and annual mean precipitation based on different regional climate model output for coarse and high resolution.

Published Paper:

van Lipzig NPM, Van de Walle J, Berthou S, Coppola E, Demuzere M, Fink AH, Finney DL, Glazer R, Ludwig P, Marsham JH, Nikulin G, Pinto JG, Rowell DP, Thiery W (2022) Representation of precipitation and top-of-atmosphere radiation in a multimodel convection-permitting ensemble for the Lake Victoria Basin (East-Africa), Clim Dyn. https://doi.org/10.1007/s00382-022-06541-5