

Annual report 2022 for Flagship Pilot Study ELVIC

Status and progress during the year including scientific highlights, end to end perspective and participants engaged in the project

The added value of convection-permitting simulations for the Lake Victoria Basin (LVB) under present-day climate conditions was assessed, based on the multi-model ensemble. A consortium paper was published in *Climate Dynamics: Modeling of extreme weather events in East Africa* with five regional climate models reveals substantial systematic improvements in metrics related to deep convection in convection-permitting models at 2.5 km to 4.5 km grid spacing compared to their counterparts where convection is parameterized (12–25 km grid spacing).

Concerning climate change assessment in the LVB (with focus on changes in weather events, like heavy precipitation, heat waves, droughts and wind storms, and the water balance of the lake), the team already decided the methodology, agreeing to apply the Pseudo Global Warming approach, in which a run is driven with re-analyses that are perturbed with a multi-member ensemble mean from the recent CMIP6 global dataset. KU Leuven performed PGW integrations for East Africa.

Summary of each workshop/activity held during the year

<i>Title, date, short description, location, website, links</i>	<i>Responsible person/-s</i>	<i>Funder</i>

Related publications during the year

<i>Title, journal and link to publication</i>	<i>Author/-s</i>	<i>Date</i>
Representation of precipitation and top-of-atmosphere radiation in a multi-model convection-permitting ensemble for the Lake Victoria Basin (East-Africa), <i>Climate Dynamics</i> , doi.org/10.1007/s00382-022-06541-5	Nicole P. M. van Lipzig, Jonas Van de Walle, Danijel Belušić, Ségolène Berthou, Erika Coppola, Matthias Demuzere, Andreas H. Fink, Declan L. Finney, Russell Glazer, Patrick Ludwig, John H. Marsham, Grigory Nikulin, Joaquim	2022-11-04

	G. Pinto, David P. Rowell, Minchao Wu & Wim Thiery	
Evaluation of High-Resolution Precipitation Products over the Rwenzori Mountains (Uganda), <i>J. Hydrometeor.</i> , doi: 10.1175/JHM-D-21-0106.1	Nakulopa, Faluku Vanderkelen, Inne ; van de Walle, Jonas ; van Lipzig, Nicole PM ; Tabari, Hossein ; Jacobs, Liesbet ; Tweheyo, Collins ; Dewitte, Olivier ; Thiery, Wim	2022-05-01
Lack of vegetation exacerbates exposure to dangerous heat in dense settlements in a tropical African city, <i>Env. Res. Lett.</i> , doi: 10.1088/1748-9326/ac47c3	J Van de Walle, O Brousse, L Arnalsteen, C Brimicombe, D Byarugaba, M Demuzere, E Jjemba, S Lwasa, H Misiani, G Nsangi, F Soetewey, H Sseviiri, W Thiery, R Vanhaeren, B F Zaitchik and N P M van Lipzig	2022-02-21
Fine-scale climate projections: What additional fixed spatial detail is provided by a convection-permitting model? <i>J. Climate.</i> doi.org/10.1175/JCLI-D-22-0009.1	Rowell, D.P. and Berthou, S.	2022-11-03
Future changes in heatwaves over Africa at the convection-permitting scale. <i>Journal of Climate.</i> 35(18), pp. 5981-6006	Birch CE, Jackson LS, Finney DL, Marsham JM, Stratton RA, Tucker S, Senior CA, Keane RJ, Guichard F, Kendon EJ.	2022
Climate change impacts on extreme rainfall in Eastern Africa in a convection permitting climate model. <i>Journal of Climate.</i>	Chapman S, Bacon J, Birch CE, Pope E, Marsham JH, Msemo H, Nkonde E, Sinachikupo K, Vanya C.	2022
Aircraft observations of the lake-land breeze circulation over Lake Victoria. <i>Quarterly Journal of the Royal Meteorological Society.</i> 148(743), pp. 557-580	Woodhams BJ, Barrett PA, Marsham JH, Birch CE, Bain CL, Fletcher JK, Hartley AJ, Webster S, Mangeni S.	2022

Planned activities for next year

Currently ELVIC is suffering from very limited staff working on East Africa. Jonas Vande Walle,

one of the cornerstones of ELVIC, has finished his PhD and left academia. KU Leuven, who is currently the main lead of ELVIC, unfortunately has no PhD or Postdoctoral staff who can dedicate their time on East Africa. We plan to submit proposals related to the ELVIC goals and acquire funding for ELVIC related work

The next activity on the agenda are the future climate simulations. These simulations are planned applying the Pseudo Global Warming approach, driving with a multi-member ensemble mean from the recent CMIP6 global dataset.

Additional relevant information

Contact person/-s

Nicole P. M. van Lipzig

The report is due the 15th of February each year and should be sent to ipoc@cordex.org.