

Preparing for the 'Next' Heatwave in Eastern Africa

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Background

- Eastern Africa is likely to experience more frequent and intense extreme temperature events, potentially leading to negative impacts related to heat stress affecting humans, livestock, environment and diverse aspects of economic productivity.
- Recent extreme temperature events in March 2024 and February 2025 affecting parts of Eastern Africa, resulting to distressing outcomes including disruption of the school calendar in South Sudan points to a growing threat of re-current temperature extremes in the region.

Problem and Opportunity

- While extreme events like floods and droughts have been widely researched and forecasted, there is limited early warning information on extreme heat and the direct impacts on human and livestock health, general wellbeing, and productivity over Eastern Africa.
- There is acute lack of impact-related early warning information on heat stress/extreme temperature, which is crucial to trigger early actions to protect communities.
- There is an opportunity to establish extreme temperature and related impact information as part of the multi-hazard early warning systems (MHEWSs), such as the Eastern Africa Hazards Watch (<https://eahazardswatch.icpac.net>) managed by the IGAD's Climate Prediction and Applications Centre (ICPAC)

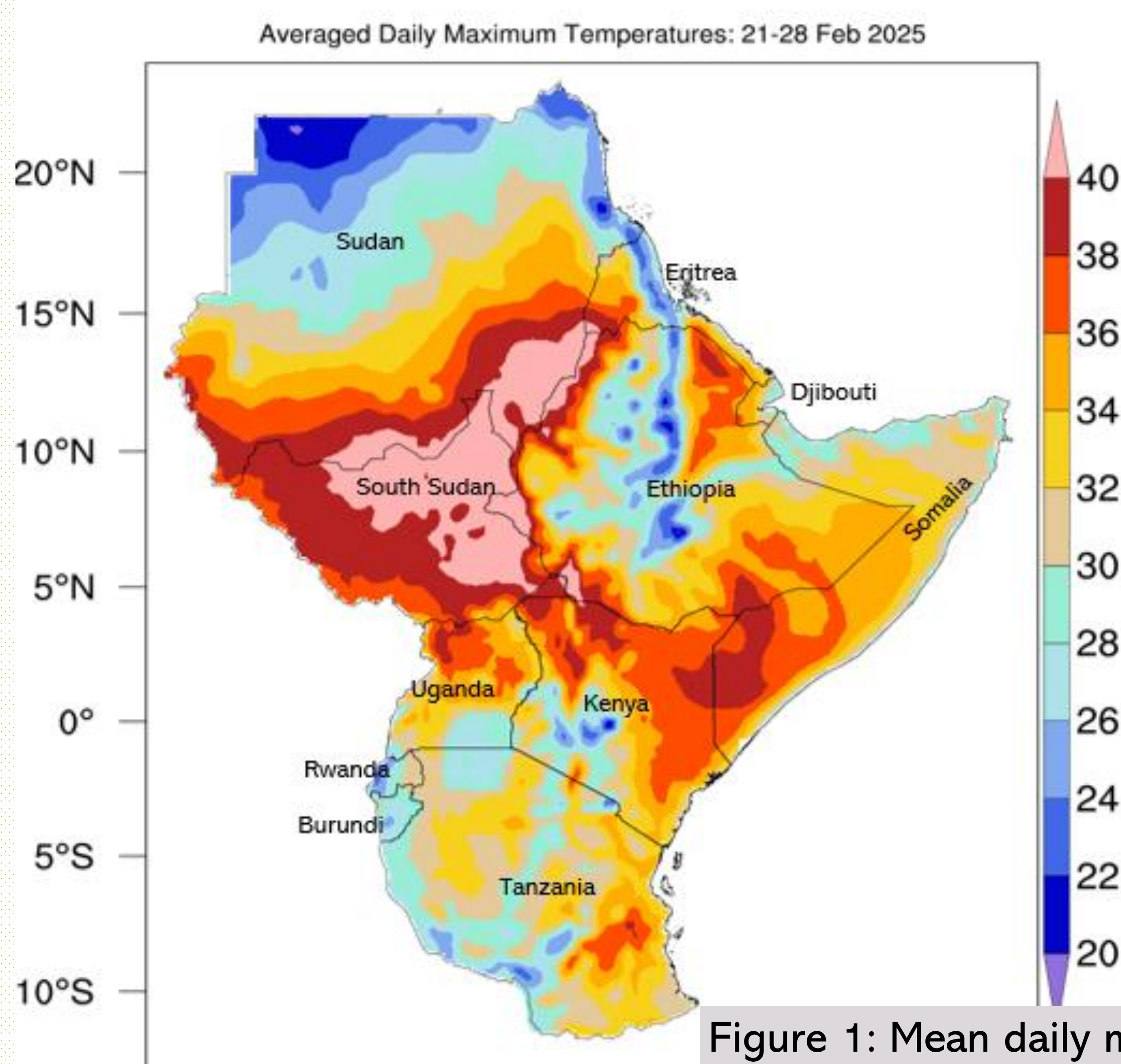


Figure 1: Mean daily maximum temperature over Eastern Africa over the period 21-28th Feb 2025

Methodology & Initial Results

- Utilizing the percentile technique, we established the 90th percentile threshold for daily maximum temperatures, with a three-day persistence to determine a heatwave, Ngoungue Langué *et al.*, (2023).
- Over Malakal, South Sudan, the 2024 heatwave was more intense & persistence compared to both 2023 and 2022, during the month of March, Figure 2.

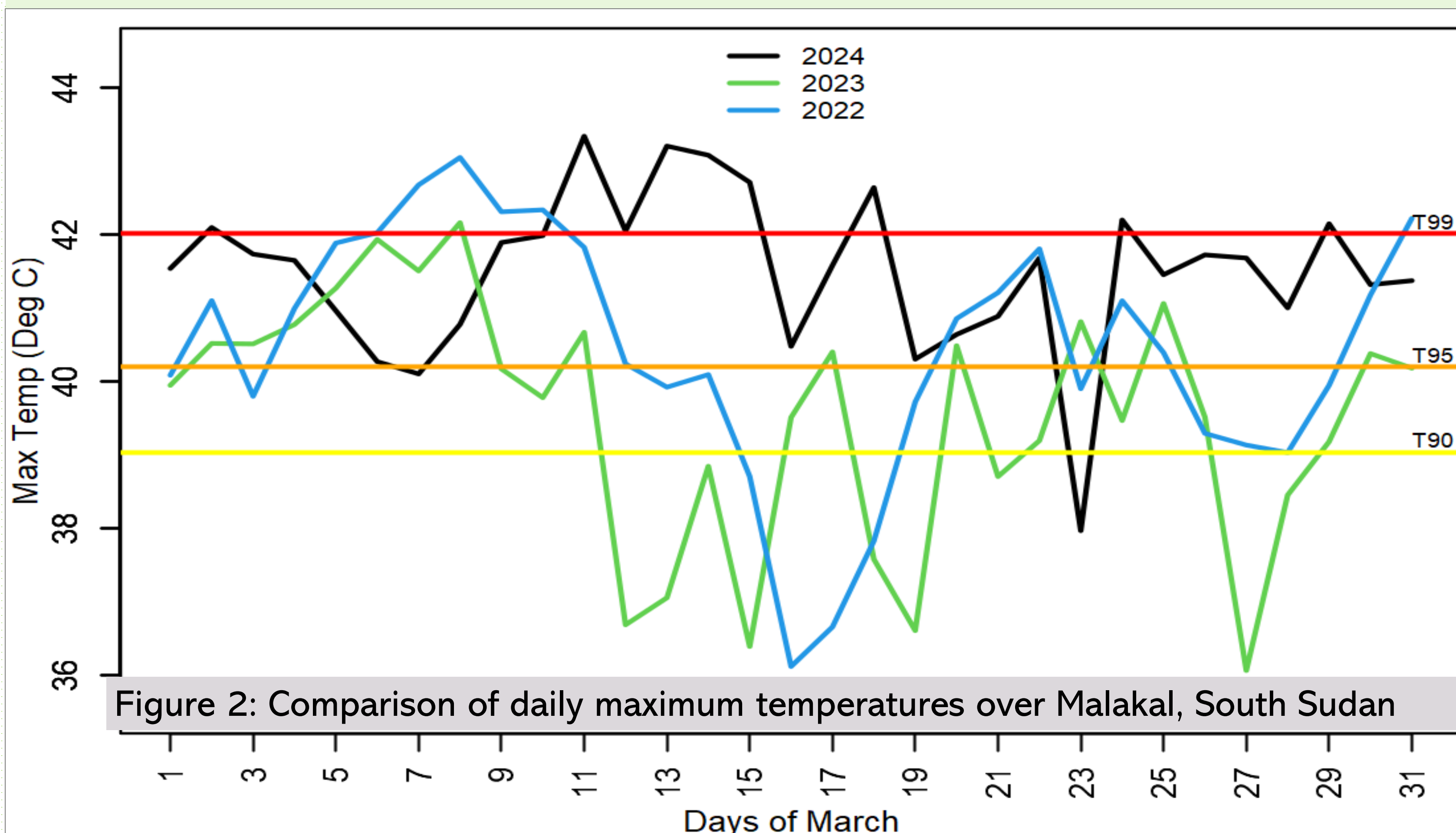
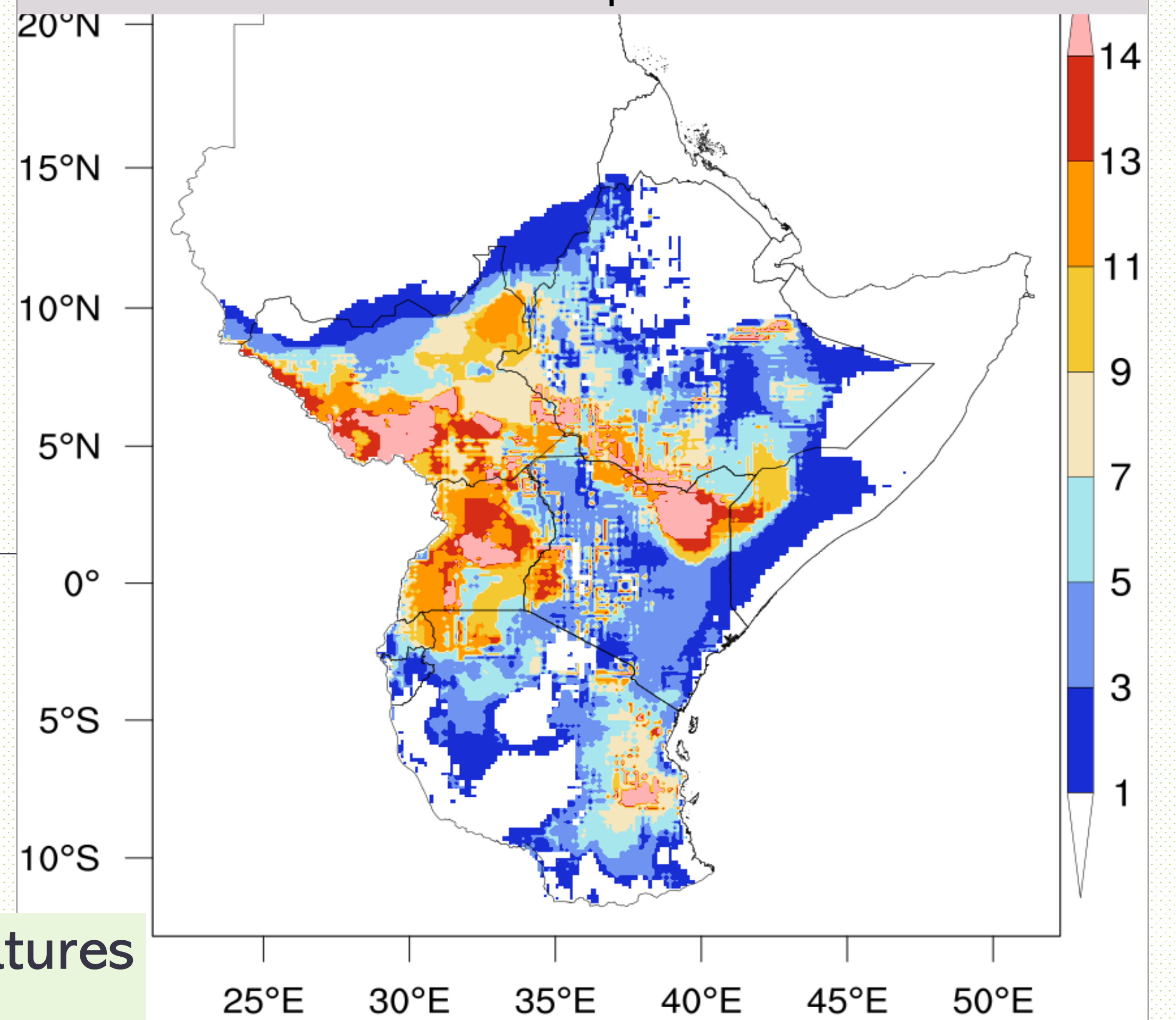


Figure 2: Comparison of daily maximum temperatures over Malakal, South Sudan

Figure 3: Number of consecutive days exceeding the heat wave threshold over the period 1-28th Feb 2025



- Most parts of Uganda and South Sudan had persistence temperatures reaching the heatwave threshold in February 2025, Figure 3.

Next Steps

- Implement percentile thresholds in NWP & S2S outputs
- Mainstreaming the methodology in operational MHEWS

Reference

Ngoungue Langué, C. G., Lavaysse, C., Vrac, M., & Flamant, C. (2023). Heat wave monitoring over West African cities: uncertainties, characterization and recent trends. *Natural Hazards and Earth System Sciences*, 23(4), 1313-1333.

Acknowledgements

All graphics were generated using ERA5 data