



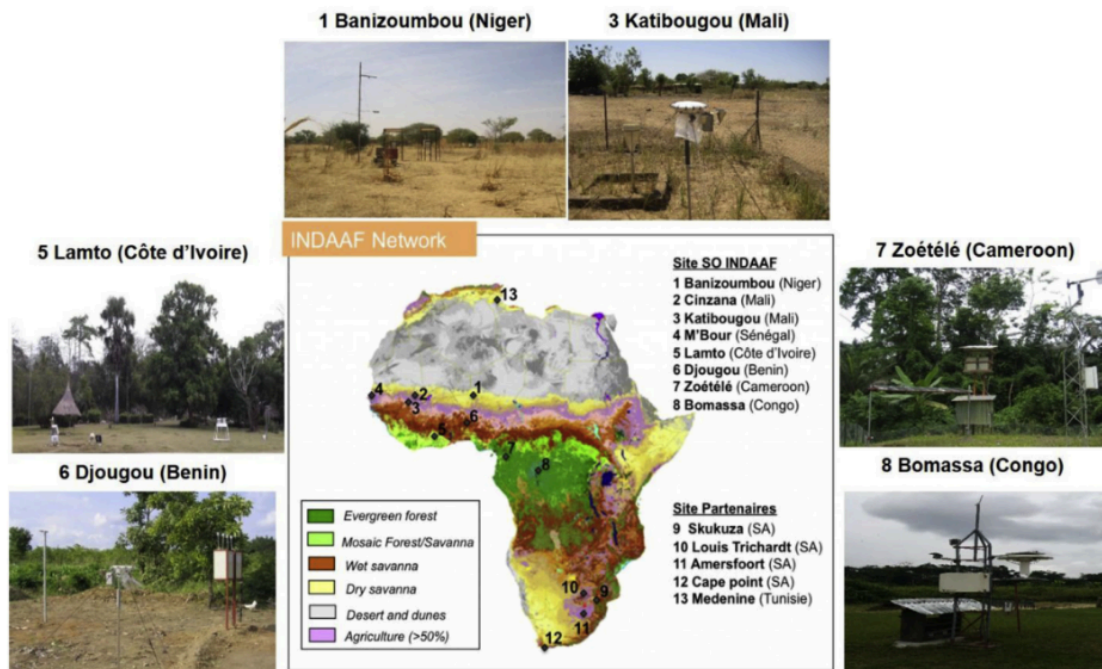
*Supplement of*

## **Influence of biogenic NO emissions from soil on atmospheric chemistry over Africa: a regional modelling study**

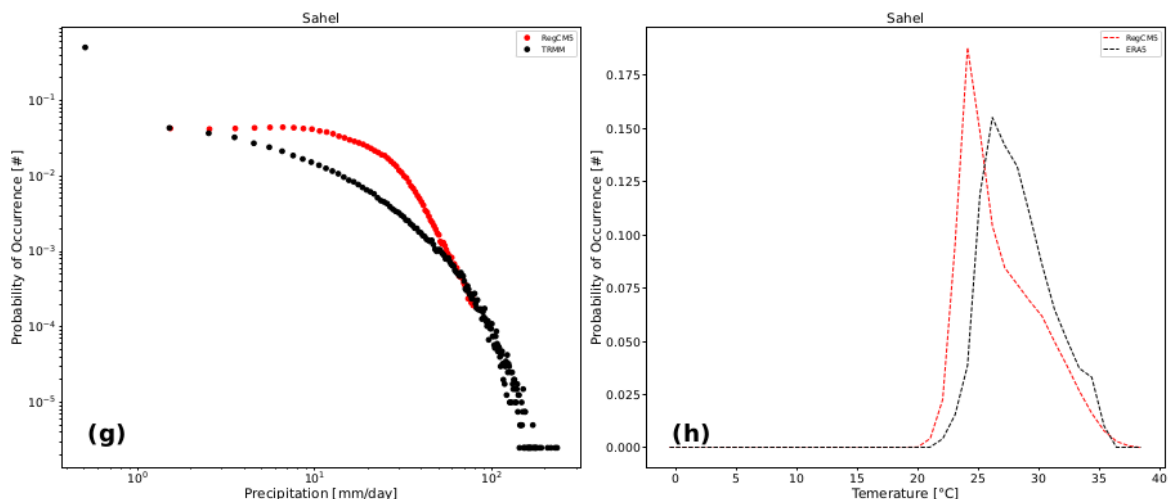
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**Figure S1.** Land-use distribution in Africa and the location of INDAAF measurement sites. Zoom-in on the vegetations at the study stations: (1) Banizoumbou, (3) Katibougou, (6) Djougou, (5) Lamto, (8) Bomassa and (7) Zoétélé.



**Figure S2.** Frequency of Daily Precipitation and Temperature Events over the Sahel region during JJA, from ERA5, TRMM and RegCM5. Units: Precipitation in mm/day, Temperature in °C.

To complement the seasonal evaluation of RegCM5 performance, we provide here an analysis of the distribution of daily temperature and precipitation intensities using Probability Density Functions (PDFs), following the approach of Giorgi et al. (2023). This assessment focuses on the Sahel region (10°W–10°E; 10°N–16°N) during the summer season (JJA), which exhibits a distinctive precipitation regime and the most pronounced effects of BioNO emissions in our simulations.

For the daily temperature PDFs (Figure S2-h), the simulated results are comparable to the observed distribution, although RegCM5 peaks are slightly shifted compared to the ERA5 data. In the simulated results we observe a high frequency (>18 %) of temperatures between 10 and 30°C, and less than 15 % of days with temperatures exceeding 30°C. Over the region presented here, ERA5 data has a higher frequency (2-16 %) of hot days (25-35 %) compared to simulated results (1-13 %). This can be linked to the underestimation of temperature values shown by RegCM5 compared to observations as seen in the manuscript.

The corresponding precipitation PDFs are intercompared in Figure S2-g. RegCM5 is close to TRMM in low (less than 10 mm/day) and high (more than 100 mm/day) precipitation intensities, but has higher frequencies of mid-precipitation intensities (between 10 and 60 mm/day) than TRMM. For high precipitation intensities (more than 70 mm/day), simulated frequencies remain slightly lower than TRMM values, which is consistent with the mean precipitation bias as shown by the hovmoller (cold bias for the Sahel region).\

## Supporting references

Giorgi, F., Coppola, E., Giuliani, G., Ciarlo, J. M., Pichelli, E., Nogherotto, R., Raffaele, F., Malguzzi, P., Davolio, S., Stocchi, P., et al.: The fifth generation regional climate modeling system, RegCM5: Description and illustrative examples at parameterized convection and convection-permitting resolutions, *Journal of Geophysical Research: Atmospheres*, 128, e2022JD038 199, <https://doi.org/10.1029/2022JD038199>, 2023.