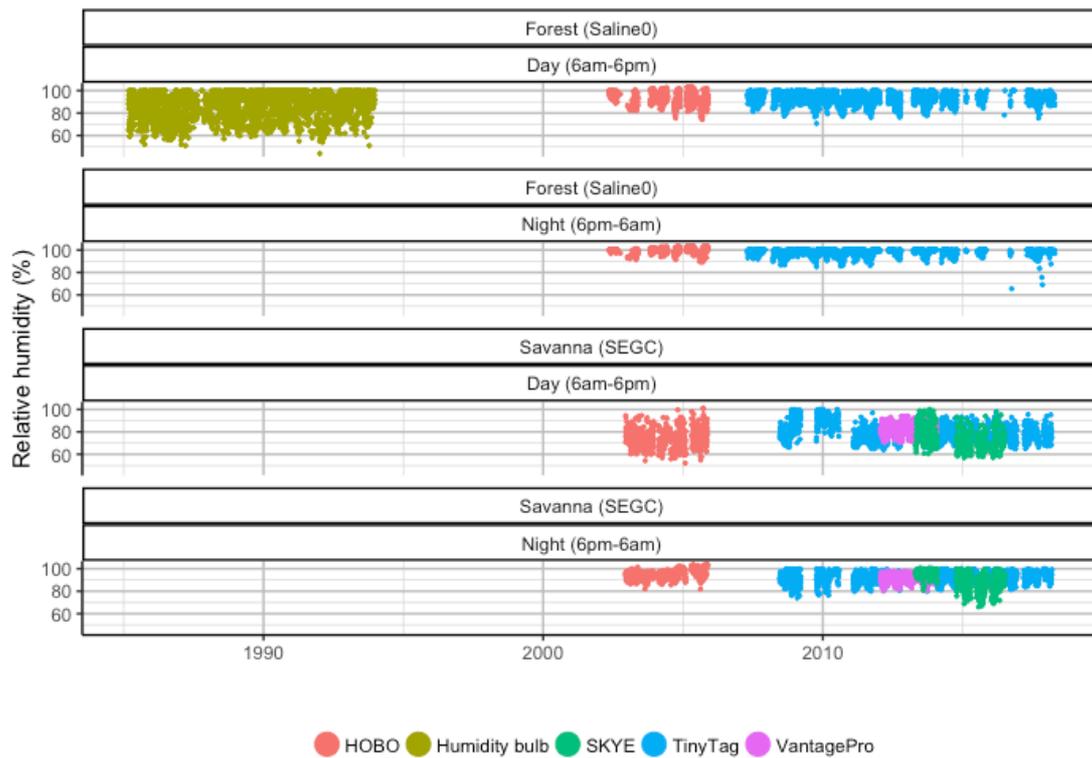


## **Metadata for humidity data recorded at Lopé NP, Gabon (1984 – 2018)**

Relative humidity has been recorded at Lopé using five different types of equipment (wet/dry bulb, HOBO units, TinyTags, and both a SKYE and a VantagePro weather station) at two sites (a savanna site: 11.605E, -0.201N and a forest site: 11.605E, -0.206N) from 1984 to the present.

From 1984, relative humidity data were recorded using a wet/dry bulb located at the forest site (1.5m aboveground under closed canopy), which was checked whenever field teams passed it or daily when logistics permitted. In 2002 all humidity recording at the forest site was transferred to continuous automatic units (ONSET HOBO® Data Loggers [refhttps://www.onsetcomp.com/](https://www.onsetcomp.com/)). Humidity recording using the same units also began in the savanna. Due to technical failures these units were removed in 2006. Other automated units (TinyTag Plus 2, Gemini Data Loggers <https://www.geminidataloggers.com/data-loggers/tinytag-plus-2>, some of which recorded relative humidity) were deployed in the forest from 2007 and in the savanna from 2008 and used until the present (with a gap at the forest site from mid-2015 to mid-2016 and intermittent recording throughout 2017 partly due to termite infestation). Two weather stations were installed in the savanna (sited near the research station, on a rock 4m from the ground) between 2012 and 2016. A Davis VantagePro2 (<https://www.davisinstruments.com/solution/vantage-pro2/>) was installed in January 2012 and recorded relative humidity every 30 minutes for two years until the equipment was struck by lightning in January 2014. A SKYE MINIMET weather station (<https://www.skyeinstruments.com/minimet-automatic-weather-station/>) was installed at the same location in 2013 and collected relative humidity data every 30 minutes. The SKYE unit ran intermittently until 2016 when the equipment was also damaged by lightning: data records between January 2014 and November 2014 were also lost.

To avoid errors in our dataset associated with direct solar radiation we separated day (6am-6pm) and night (6pm-6am) observations for data derived from the automatic units and calculated the mean humidity for each session per 24-hour period (Figure 1).



**Figure 1 Time series plots of day and night relative humidity at Lopé NP 1984-2018.** Coloured dots show daily observations from both sites (forest and savanna) and different equipment. Humidity bulb observations were recorded once per day at different times. The remaining observations are mean values for the day (6am – 6pm) or night (6pm – 6am) from automated equipment (HOBO, TinyTags, SKYE and VantagePro weather stations) with observation intervals up to 30 minutes long.

We restricted further analyses to night-time data only which precluded data derived from the humidity bulb as it was always collected during the daytime. In order to reduce the impact of temperature on humidity we converted relative humidity (%) to absolute humidity ( $\text{g/m}^3$ ) using simultaneous temperature records within the R package “humidity” (Cai 2018).

The accompanying data includes daily mean absolute humidity from each automatic recording unit across both sites (Humidity daily dataset A in accompanying manuscript).