



*Supplement of*

## **How long does carbon stay in a near-pristine central Amazon forest? An empirical estimate with radiocarbon**

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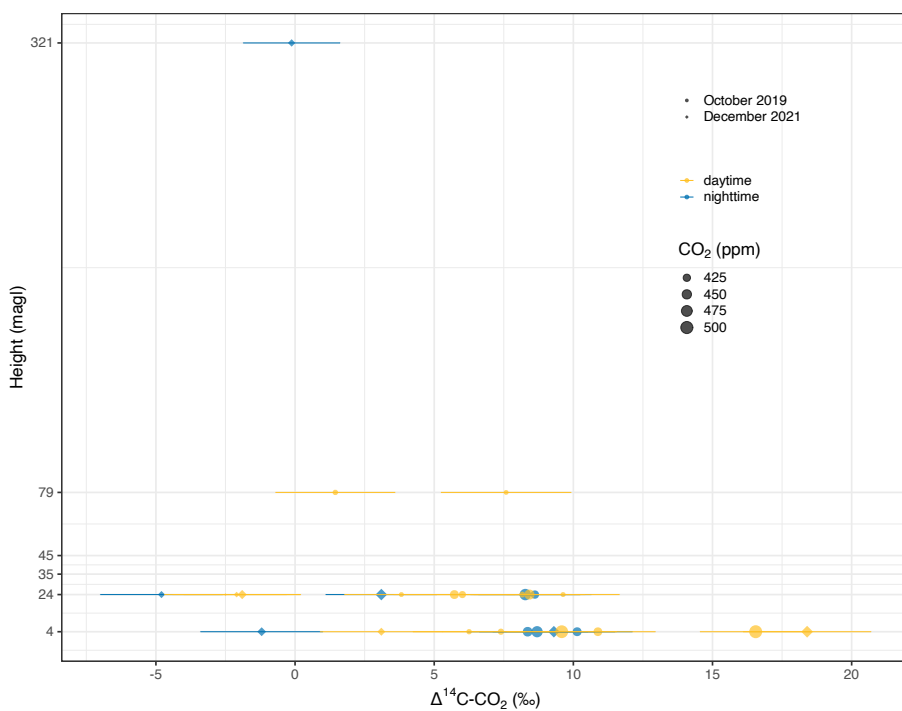


Figure S 1: Variation of  $\text{CO}_2$  concentrations and  $\Delta^{14}\text{C-CO}_2$  with height for samples collected during daytime (after 5:45 local time – LT, UTC = LT +0400 – and before 18:00 LT) and nighttime (between 18:00 LT and 5:45 LT). The daytime variation in  $\text{CO}_2$  was higher (111 ppm and 92 ppm in resp. 2019 and 2021) than the nighttime variation (50 ppm and 66 ppm in resp. 2019 and 2021), which is because the daytime window includes the early morning concentrations before the mixing of the nocturnal boundary layer. The error of  $\text{CO}_2$  concentrations was not higher than 0.3 ppm. A height of 35 m marks the top of the canopy, with some emergent trees achieving 45 m in the studied site.

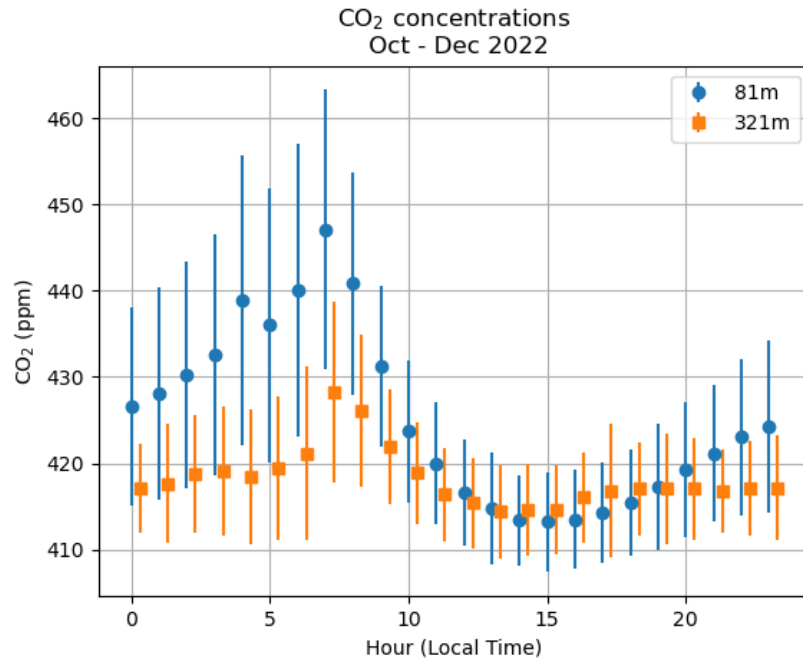


Figure S 2: Average CO<sub>2</sub> concentrations for the dry-to-wet transition period in 2022 (October to December) as measured at the Tall Tower at 81m (blue circles) and 321m (orange squares). The average daily variation at 81m was 34 ppm, while the average daily variation at 321m was 14 ppm. Local time is equal to UTC minus 4 hours.

## Meteorological data

The values of the variables in 2019 (orange line) have changed a lot compared to 2021 (blue line). The temperature (Temp25 - at 25 m) was lower in 2021 (Figure S3), probably because the incident short wave radiation (Sin) was lower (Figure S4). In addition, it rained more on both days in December 2021 (Figure S5) and consequently, the soil was wetter (Hsoil) (Figure S6). The vertical lines indicate the two days investigated in each experiment. The time axis corresponds to 10 days (4 days before and 4 days after the two days investigated) of the half-hourly resolved data.

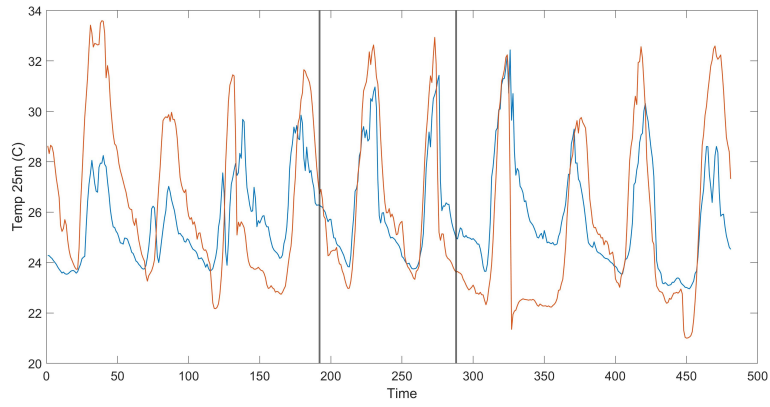


Figure S 3: Variation of temperature ( $^{\circ}\text{C}$ ) at 25 m above ground level at the 80-m walk-up tower, ATTO site. In 2019 data is represented in orange and in 2021 it is in blue. Vertical grey lines correspond to the dates of air sampling, i.e. 05 October and 06 October for the 2019 campaign and 19 December and 20 December for the 2021 campaign.

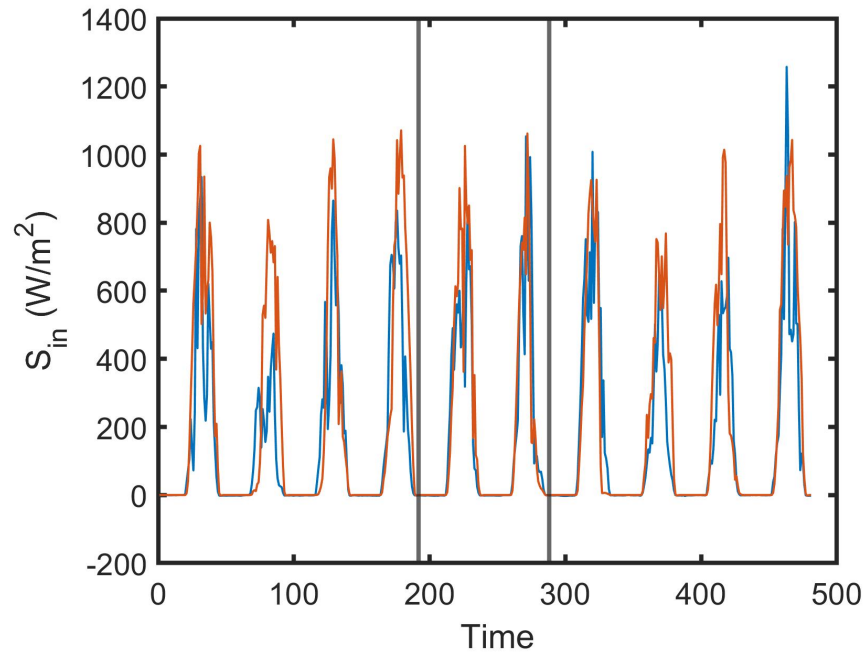


Figure S 4: Incoming radiation  $S_{in}$  ( $W/m^2$ ) at ATTO site in 2019 (orange) and in 2021 (blue). Vertical grey lines correspond to the dates of air sampling, i.e. 05 October and 06 October for the 2019 campaign and 19 December and 20 December for the 2021 campaign.

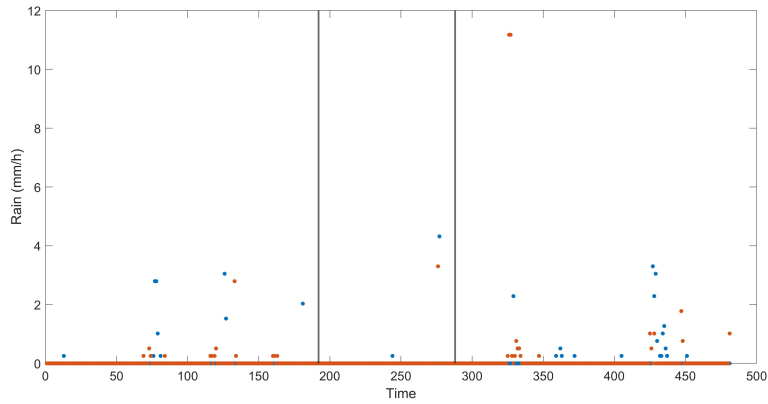


Figure S 5: Precipitation patterns (mm/h) at ATTO site in 2019 (orange) and in 2021 (blue). Vertical grey lines correspond to the dates of air sampling, i.e. 05 October and 06 October for the 2019 campaign and 19 December and 20 December for the 2021 campaign.

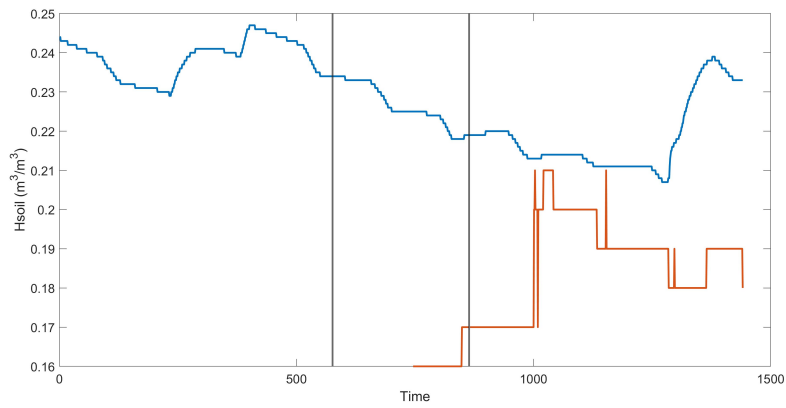


Figure S 6: Soil moisture  $H_{soil}$  ( $m^3/m^3$ ) at ATTO site in 2019 (orange) and in 2021 (blue). Vertical grey lines correspond to the dates of air sampling, i.e. 05 October and 06 October for the 2019 campaign and 19 December and 20 December for the 2021 campaign.