

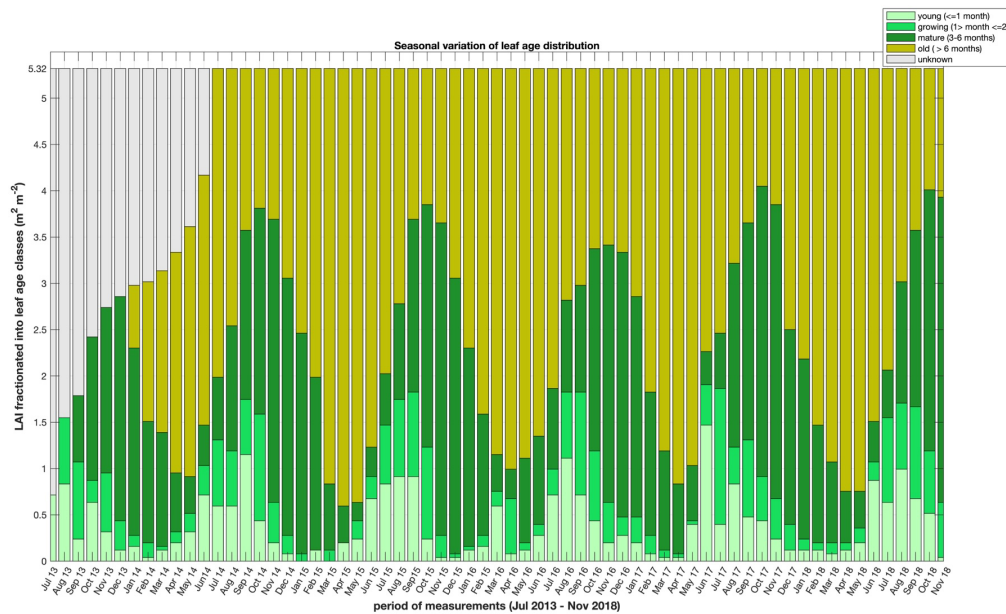
## Supplementary Information

### Leaf demography and phenology - phenotype description

A complete description about the installation of the Phenocam on the tower, data collection, image selection and crown selection are given in Lopes et al. (2016) and Gonçalves et al. (2020). The camera monitors 194 upper canopy trees that are free of vines, and evident and massive flush events were observed for 69% of the 194, representing 134 trees. The definition of phenotypes of the 134 trees is:

1. Evergreen: tree crowns that remain green but have detectable flushes, with at least four over the sampling period (2013-2018).
2. Semi-evergreen: similar to evergreen, but flushing maximum three times over the entire sampling period (2013-2018).
3. Brevideciduous: tree crowns that have a brief abscised stage (bare) followed by flushing, approximately every year (2013-2018).
4. semi-brevideciduous: tree crowns that have a brief abscised stage (bare) followed by flushing, but the difference with brevideciduous is that the flushing-abscission dynamics is irregular.

The left 60 tree individuals did not present evident and massive flush events, and therefore it is assumed that they flush new leaves continuously across the year (Lopes et al., 2016).



**Figure S1.** LAI fractionated into leaf age classes from July 2013 to November 2018.

## Tables

**Table S1:** Isoprene emission capacity across species and leaf ages (days after flushing). Values within brackets represent one standard deviation of mean.

tree species	Isoprene (mg m <sup>-2</sup> h <sup>-1</sup> )	leaf age (days)	leaf age class*	emitter category	height (m)	date of measurements
<i>Eschweilera amazonica</i>	2.79	61	mature	medium	23	Nov 3, 2017
<i>Eschweilera bracteosa</i>	2.35	59	growing	medium	24	Nov 1, 2017
<i>Stryphnodendron racemiferum</i>	3.52	123	mature	medium	24	Nov 3, 2017
<i>Stryphnodendron racemiferum</i>	3.30	425	old	medium	24	Nov 2, 2017
<i>Protium apiculatum</i>	2.26	121	mature	medium	24	Nov 1, 2017
<i>Protium apiculatum</i>	1.19	486	old	medium	24	Nov 1, 2017
<i>Protium guianense</i>	2.05	112	mature	medium	21	Oct 22, 2017
<i>Protium guianense</i>	0.83	414	old	medium	24	Oct 23, 2017
<i>Sacoglottis cf. guianensis</i>	1.48	112	mature	medium	24	Oct 23, 2017
<i>Sacoglottis cf. guianensis</i>	2.02	446	old	medium	24	Oct 23, 2017
<i>Gustavia elliptica</i>	0.56	116	mature	low	22	Oct 27, 2017
<i>Gustavia elliptica</i>	0.60	295	old	low	22	Oct 27, 2017
<i>Helicostylis tomentosa</i>	not detected	20	young	low	26	Oct 27, 2017
<i>Helicostylis tomentosa</i>	0.49	143	mature	low	26	Oct 24, 2017
<i>Eugenia cuspidifolia</i>	0.45	107	mature	low	26	Oct 18, 2017
<i>Eugenia cuspidifolia</i>	0.08	409	old	low	26	Oct 18, 2017
<i>Eschweilera cyathiformis</i>	0.30	122	mature	low	30	Nov 2, 2017
<i>Eschweilera cyathiformis</i>	0.03	578	old	low	30	Nov 2, 2017
<i>Symphonia globulifera</i>	0.13	138	mature	low	26	Oct 19, 2017
<i>Symphonia globulifera</i>	0.08	258	old	low	26	Oct 19, 2017
<i>morphotype 1</i>	0.12	79	mature	low	30	Oct 21, 2017
<i>morphotype 1</i>	0.07	475	old	low	30	Oct 21, 2017
			old	not		
<i>Pouteria fimbriata</i>	not detected	301		detected	26	Nov 2, 2017
			old	not		
<i>Mouriri cf. brevipes</i>	not detected	414		detected	26	Oct 23, 2017
	not detected		mature	not		
<i>Chimarrhis turbinata</i>		110		detected	26	Oct 21, 2017

<i>Chimarrhis turbinata</i>	not detected	475	old	not detected	26	Oct 21, 2017
<i>Mouriri cf. dimorphandra</i>	not detected	15	young	not detected	32	Oct 19, 2017
<i>Mouriri cf. dimorphandra</i>	not detected	108	mature	not detected	32	Oct 19, 2017
<i>Mouriri cf. dimorphandra</i>	not detected	503	old	not detected	32	Oct 19, 2017
<i>Mouriri cf. duckeana</i>	not detected	82	mature	not detected	24	Oct 24, 2017
<i>Mouriri cf. duckeana</i>	not detected	415	old	not detected	24	Oct 24, 2017
<i>Apeiba glabra</i>	not detected	17	young	not detected	26	Oct 21, 2017
<i>Aspidosperma sandwithianum</i>	not detected	123	mature	not detected	23	Nov 3, 2017
<i>Geissospermum argenteum</i>	not detected	23	young	not detected	22	Oct 27, 2017
<i>Geissospermum argenteum</i>	not detected	358	old	not detected	22	Oct 27, 2017
<i>Hymenaea courbaril</i> ***	0.06	0	young	high		Sep 24, 1999
<i>Hymenaea courbaril</i> ***	0.54	10	young	high		Oct 04, 1999
<i>Hymenaea courbaril</i> ***	0.68	11	young	high		Oct 05, 1999
<i>Hymenaea courbaril</i> ***	2.06	13	young	high		Oct 07, 1999
<i>Hymenaea courbaril</i> ***	11.17	28	young	high		Oct 22, 1999
<i>Hymenaea courbaril</i> ***	9.12	29	young	high		Oct 23, 1999
<i>Hymenaea courbaril</i> ***	5.60	226	old	high		May 08, 1999
<i>Hymenaea courbaril</i> ***	6.71	227	old	high		May 09, 1999

\* leaf age classes: young leaves (0–1 month), growing (1–2 months), mature leaves (3–6 months), and old leaves (>6 months)

\*\* Fauset et al. (2015)

\*\*\*Measurements from the Southwestern Amazonia (Kuhn et al., 2004b)

Table S2: Tree species monitored with the phenocam installed on the INSTANT tower and the isoprene emission trait.

File: .xlsx

Table S3: Isoprene emission trait source. The isoprene emission trait was attributed according to literature, new measurements and imputed as in Taylor et al. (2018, 2019).

File: .xlsx