Supplementary material: Carbon flux and forest dynamics: increased deadwood decomposition in tropical rainforest tree-fall gaps

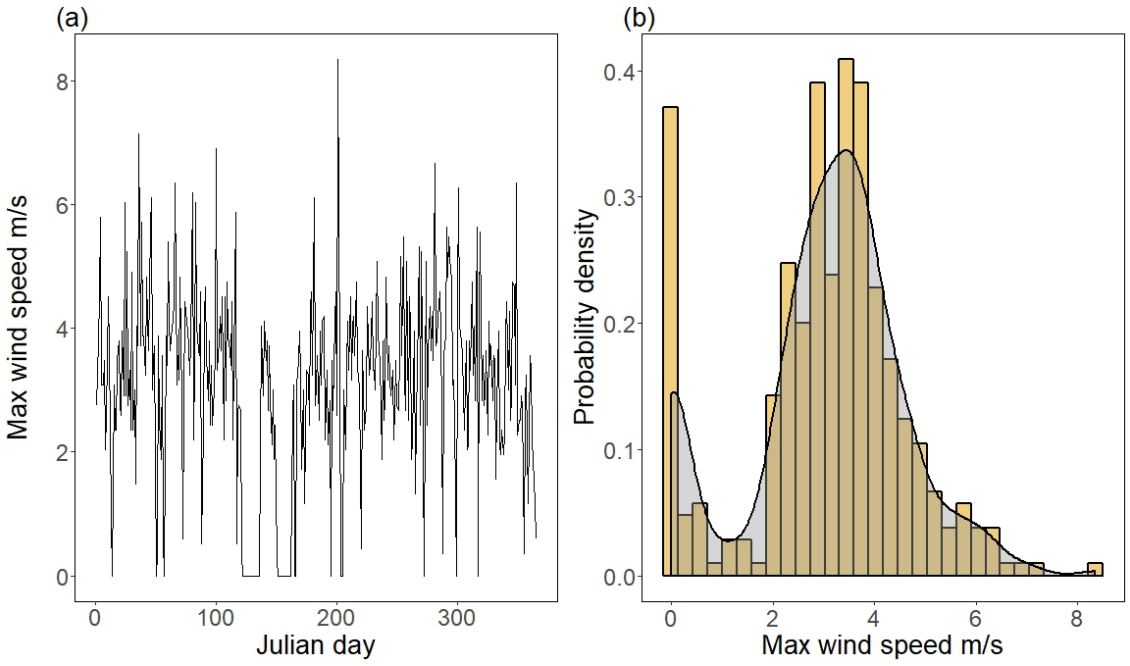

Figure S1. Time series (a) and probability distribution of maximum daily wind speed (b) at the study location, Maliau Basin, Malaysian Borneo 2017. Julian day 201 (20th July) experienced the strongest winds of the year (8.4 m/s), which resulted in large trees falling in the study area during the same 24-hour period.

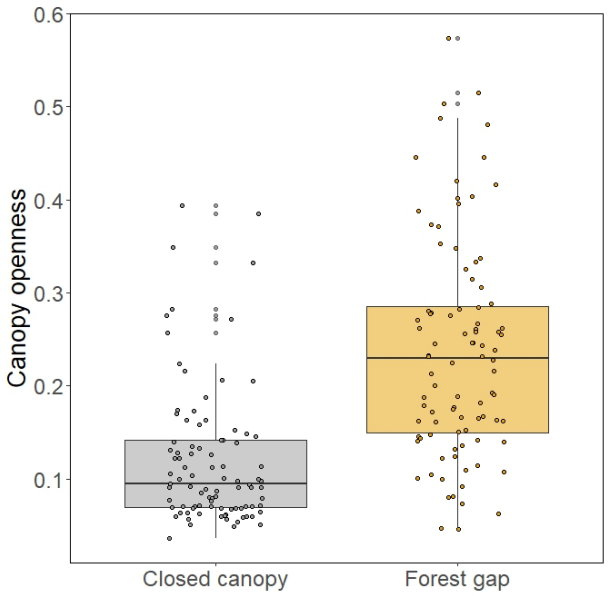

Figure S2. Median and interquartile range of canopy openness calculated using hemispherical photographs taken directly above experimental wood blocks in closed canopy and forest gap sites. Points represent the raw data.

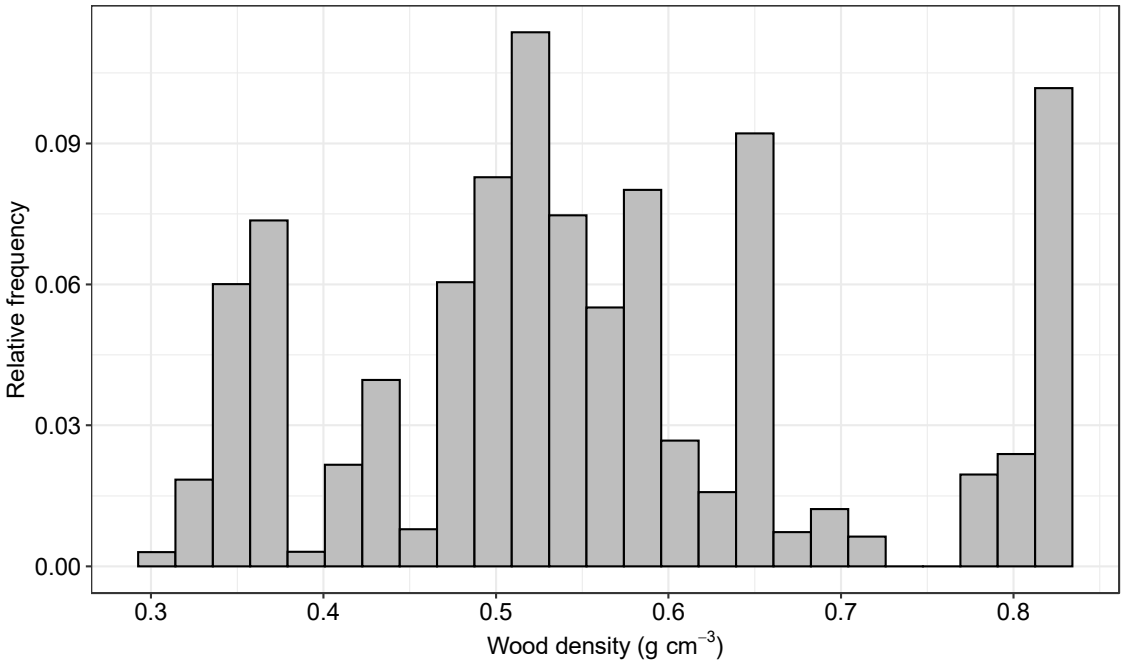

Figure S3. A histogram with 25 bins showing the relative frequency distribution of wood densities simulated from a 1996 tree species distribution survey at Danum Valley from Newbery and Lingenfelder (2004) and the Global wood density database (Zanne et al., 2009).

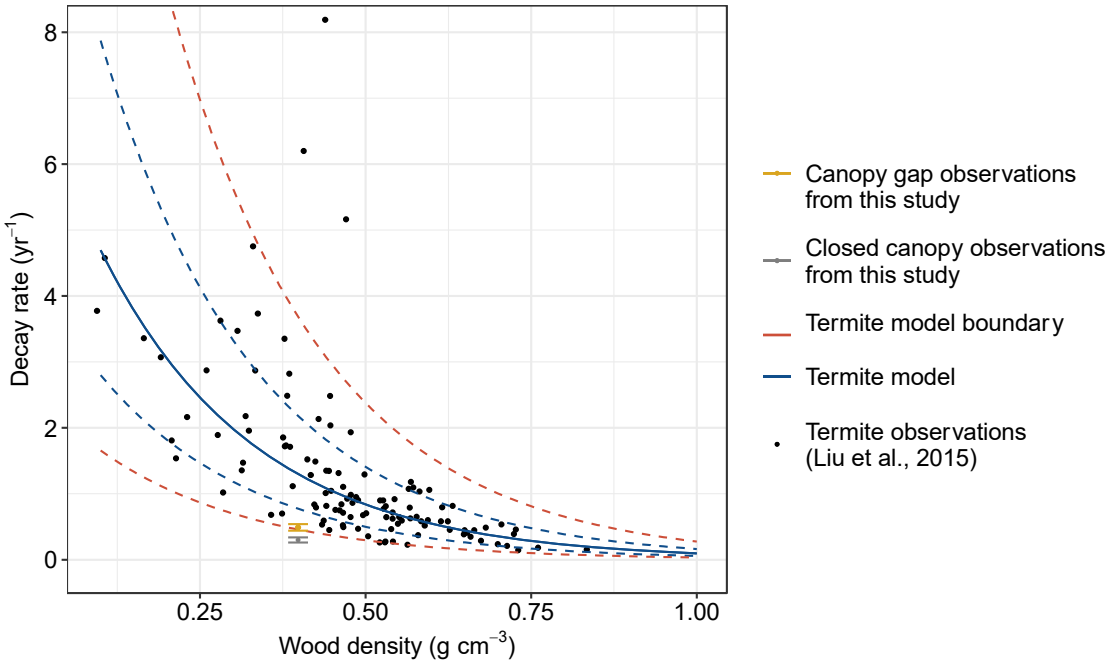

Figure S4. Wood density and decay rate data from Liu et al. (2015) are displayed in black with an L1 exponential model (solid blue line) that minimizes the sum of the absolute value of the residuals. Dashed blue lines indicate the middle 68% of the data that was used to approximate the standard deviation. Dashed red lines indicate the middle 96% of the data where the simulations were truncated. The decay rates for *Pinus radiata* in this study in the canopy gaps are shown in gold. The error bars represent one standard deviation. The mean decay rate for *Pinus radiata* under the closed canopy is shown in grey.

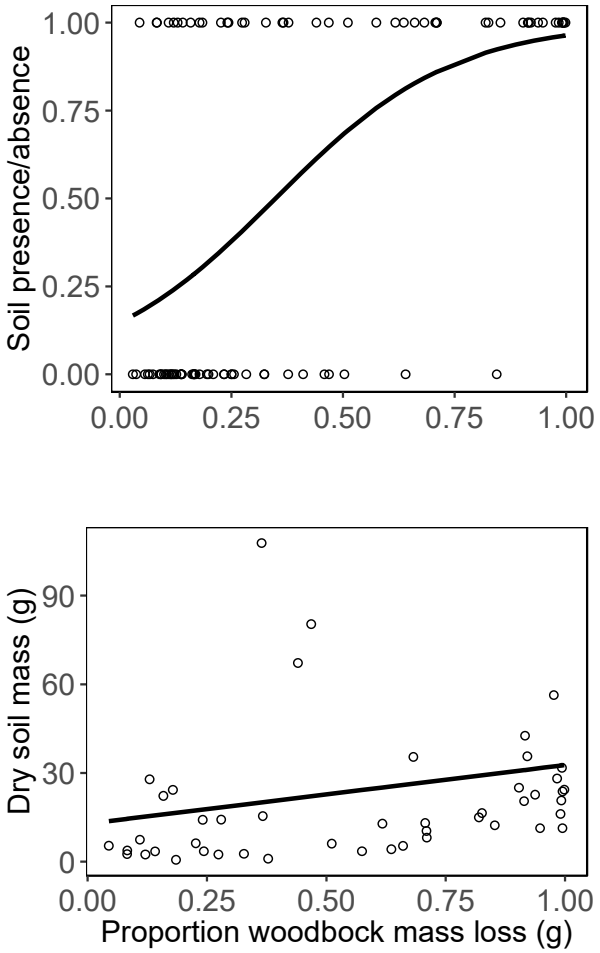

Figure S5. A two-stage analysis of the relationship between wood mass lost from experimental wood blocks and termite-derived carton and soil recovered from wood blocks. Top panel: significant positive relationship between the proportion of wood mass lost and the likelihood that a wood block contained termite material (0 values indicate no termite material was recovered; values of 1 indicate that > 0 termite material was recovered). Bottom panel: wood blocks from which no termite carton material was recovered were removed to avoid difficulties in model fitting with zero-inflated data. Here, a significant positive relationship between is also shown between proportion mass lost from experimental wood blocks and the mass of soil bought into wood block bags. Model fitted value is shown (solid black line) along with standard errors around model fit (grey ribbon). Only open woodblocks were included in this analysis as no termite soil or carton was recovered from the closed bags.

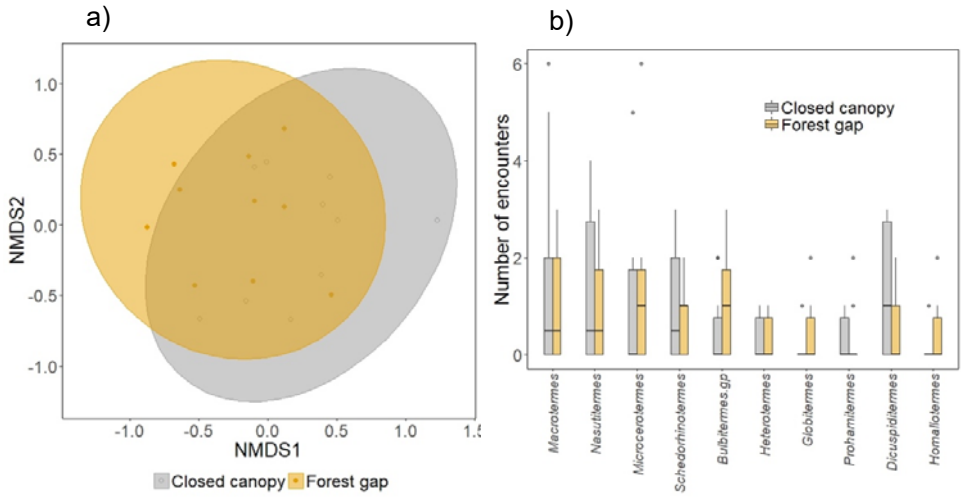

Figure S6. (a) A non-metric multidimensional scaling (NMDS) ordination to visualise the dissimilarity (Bray-Curtis) of termite communities sampled using 50 m termite transects from closed canopy (grey ellipse) and gap (yellow ellipse) sites. NMDS was selected to assess differences in community composition because this approach is robust to zero-inflated, non-normal data [1]. NMDS points were calculated using the *metaMDS* function (package: *vegan*). (b) The median (horizontal black lines) and interquartile range (boxes) of number of encounters of termites belonging to different genera sampled from closed canopy (grey boxes) and forest gap sites (yellow boxes) (b).

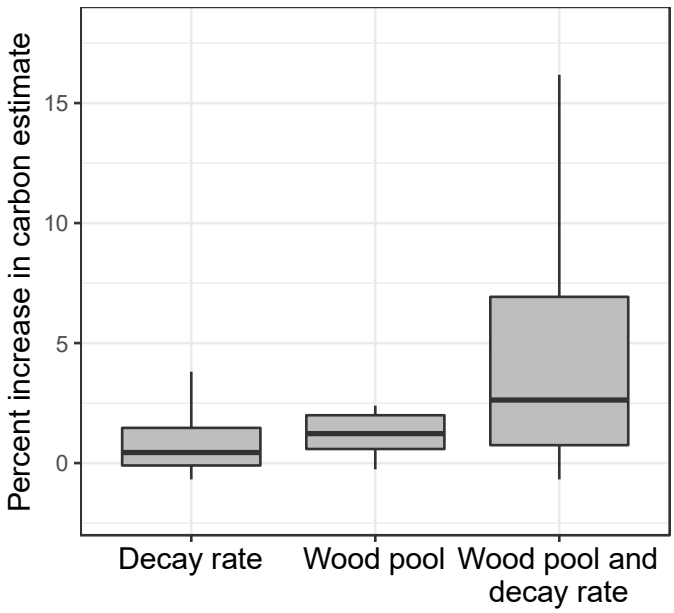

Figure S7. Bootstrapping results of applying only the change in decay rate (Decay rate), the change in the size of the wood pool in the gaps (Wood pool), and both (Wood pool and decay rate) to show the relative contribution of each driver of wood decay in the canopy gaps for an assumed proportion of 0.7% forest gaps. The medians and interquartile ranges are shown in the box, and the lower and upper whiskers represent the minimum and maximum values no further than 1.5 times the interquartile range. Outliers are excluded due to skew in the data.

Table S1. Canopy gap characteristics

Gap number	Length (m)	Width (m)	Area (m^2)	Shape	Mean openness	s.e openness
1	34	30	1020	Circular	0.16	0.01
2	50	20	1000	Eclipse	0.26	0.05
3	30	40	1200	Eclipse	0.21	0.05
4	29	21	609	Circular	0.16	0.03
5	17	15	255	Circular	0.16	0.05
6	30	27	810	Irregular	0.29	0.04
7	33	18	594	Irregular	0.32	0.03
8	41	40	1640	Irregular	0.24	0.03
9	30	19	570	Circular	0.17	0.03
10	26	15	390	Irregular	0.40	0.04