



## Supplement of

## Global satellite-driven estimates of heterotrophic respiration

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Figure S1: Root-mean-square sum of the normalized difference between the prior and posterior CMS-Flux NEP estimates (where the posterior flux is used for normalization).



Figure S2: Comparison of observed annual respiration terms at SRDB sites vs. bottom-up estimates at the same sites for (left) 1979 soil respiration sites and (right) 362 heterotrophic respiration sites. Parameters in the bottom-up equations are sequentially optimized on the entire  $R_s$  dataset. All  $R_h$  observations are then used to optimize the parameters of the  $R_h$ - $R_s$  relationship. Each point denotes a single experiment and is colored by the experiment's latitude.

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Figure S3: Locations of Rh experiments in SRDB.





Figure S4: Mean R<sub>h</sub> [gC m<sup>-2</sup> yr<sup>-1</sup>] from the (left) top-down and (right) bottom-up models.

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