Supporting information for

Global variability of belowground autotrophic respiration in terrestrial ecosystems

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Table S1 Global variables used for predicting the spatial and temporal RA

	Variables[1]	Type	Type of variability	Sources
Climate	Mean annual temperature	Split	Yearly	https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.01/, (Harris et al. 2014)
	Mean annual precipitation	Split	Yearly	
	Diurnal temperature range	Split	Yearly	
	Potential evaportransporation	Split	Yearly	
	Palmer Drought Severity Index	Split	Yearly	https://www.esrl.noaa.gov/psd/data/gridded/data.pdsi.html(Dai et al. 2004)
	Downward Shortwave radiation	Split	Yearly	https://www.esrl.noaa.gov
	Nitrogen deposition	Split	Yearly	https://www.isimip.org/gettingstarted/availability-input-data-isimip2b/
Soil	Soil carbon content	-	Static	https://soilgrids.org/#!/?layer=TAXNWRB_250m(Hengl et al. 2017)
	Soil nitrogen content	-	Static	https://webmap.ornl.gov/ogc/index.jsp
	Soil water content	Split	Yearly	https://www.esrl.noaa.gov/psd/data/gridded/data.cpcsoil.html
Vegetation	MODIS land cover	-	Static	https://glcf.umd.edu/data/lc/

[1]Although this study tried to link some variables relating to plant activities, such as Normalized Difference Vegetation Index (NDVI), Leaf Area Index (LAI), however, these variables could not help to improve the model efficiency. Due to the lack of fully land cover of these products, and the plant activities could be indirectly reflected by temperature, precipitation, potential evaportransporation, soil nutrients, etc., therefore, this study did not use NDVI or LAI for spatial and temporal modelling of RA.

Figures

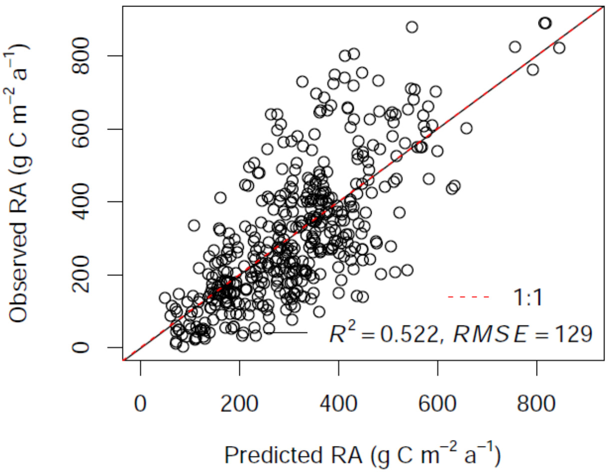

Fig. S1. Comparison between data-derived belowground autotrophic respiration (RA) and observed RA using a 10-fold cross-validation.

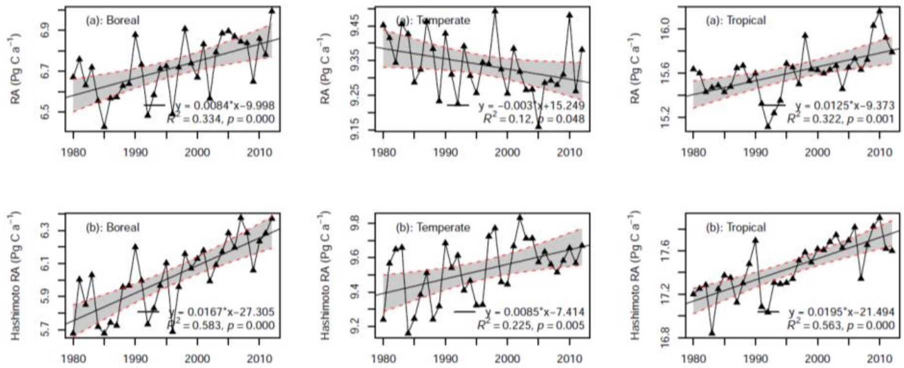

Fig. S2. Inter-annual variability of belowground autotrophic respiration (RA) for this study (a) and Hashimoto RA (b) for boreal, temporal and tropical areas

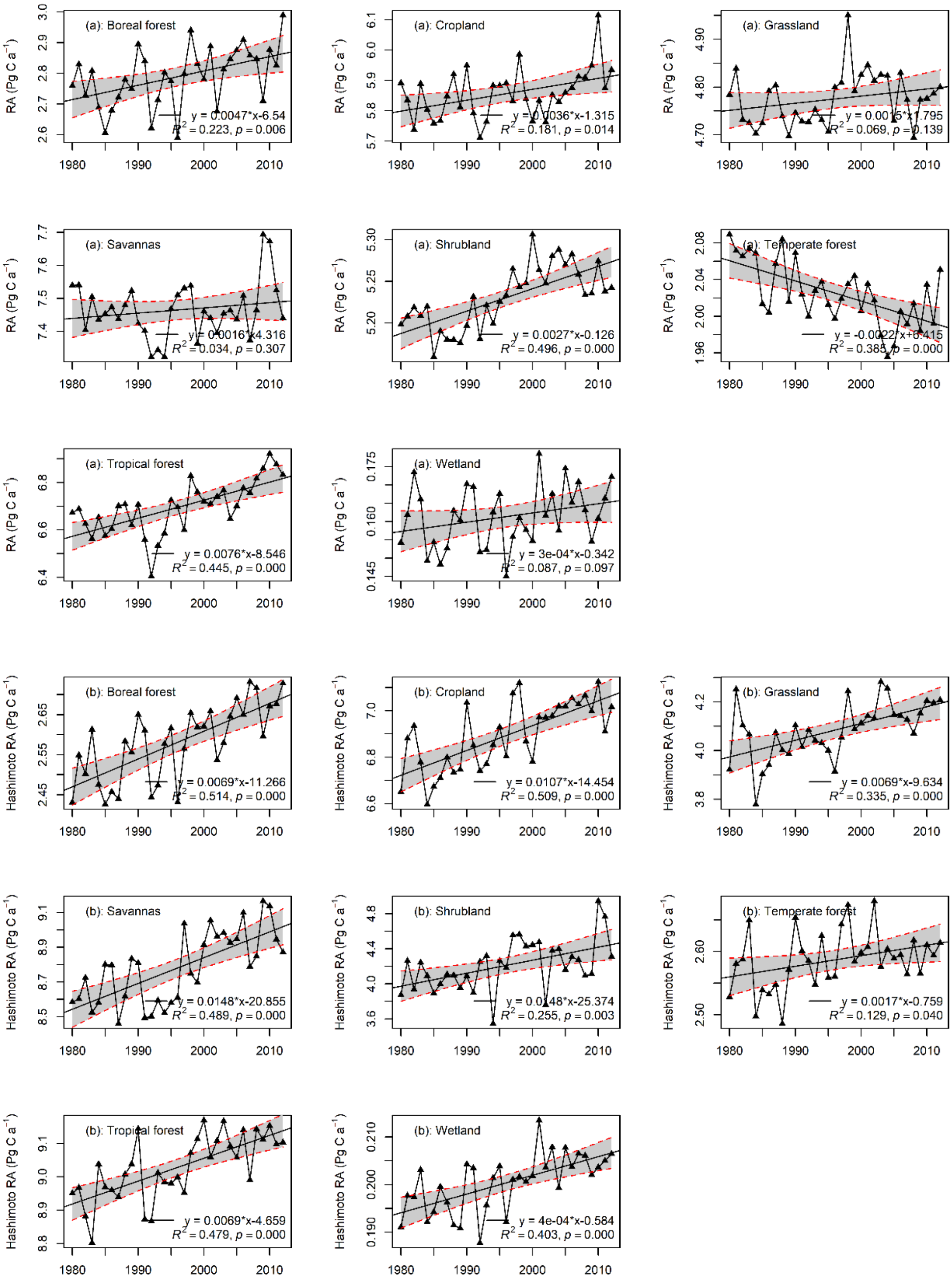

Fig. S3. Inter-annual variability of belowground autotrophic respiration (RA) for this study (a) and Hashimoto RA (b) for boreal forest, cropland, grassland, savannas, shrubland, temperate forest, tropical forest and wetland.

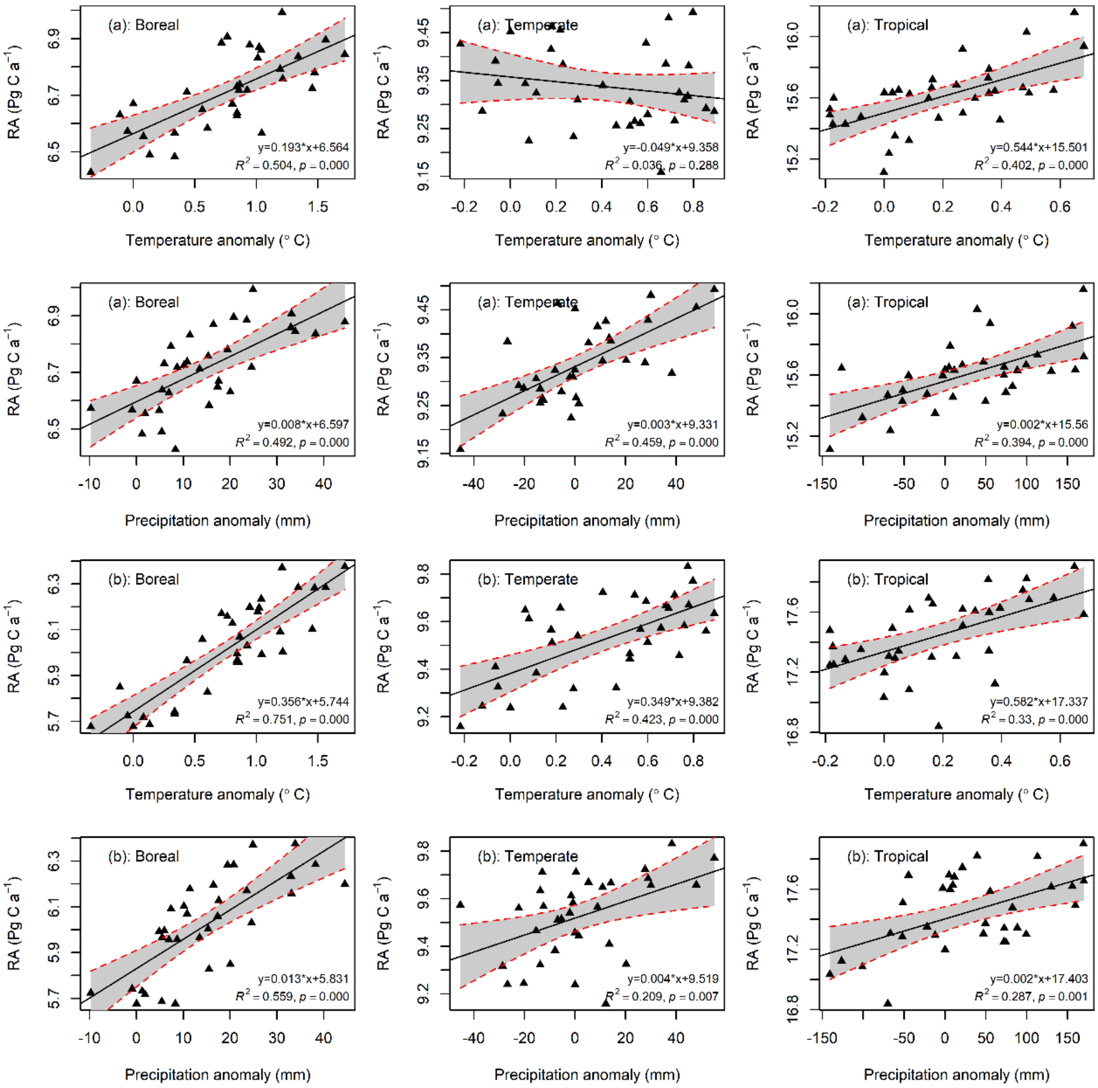

Fig. S4. The relationships between total belowground autotrophic respiration (RA) and temperature/precipitation anomaly for this study (a) and Hashimoto RA (b) for boreal, temperate and tropical areas.

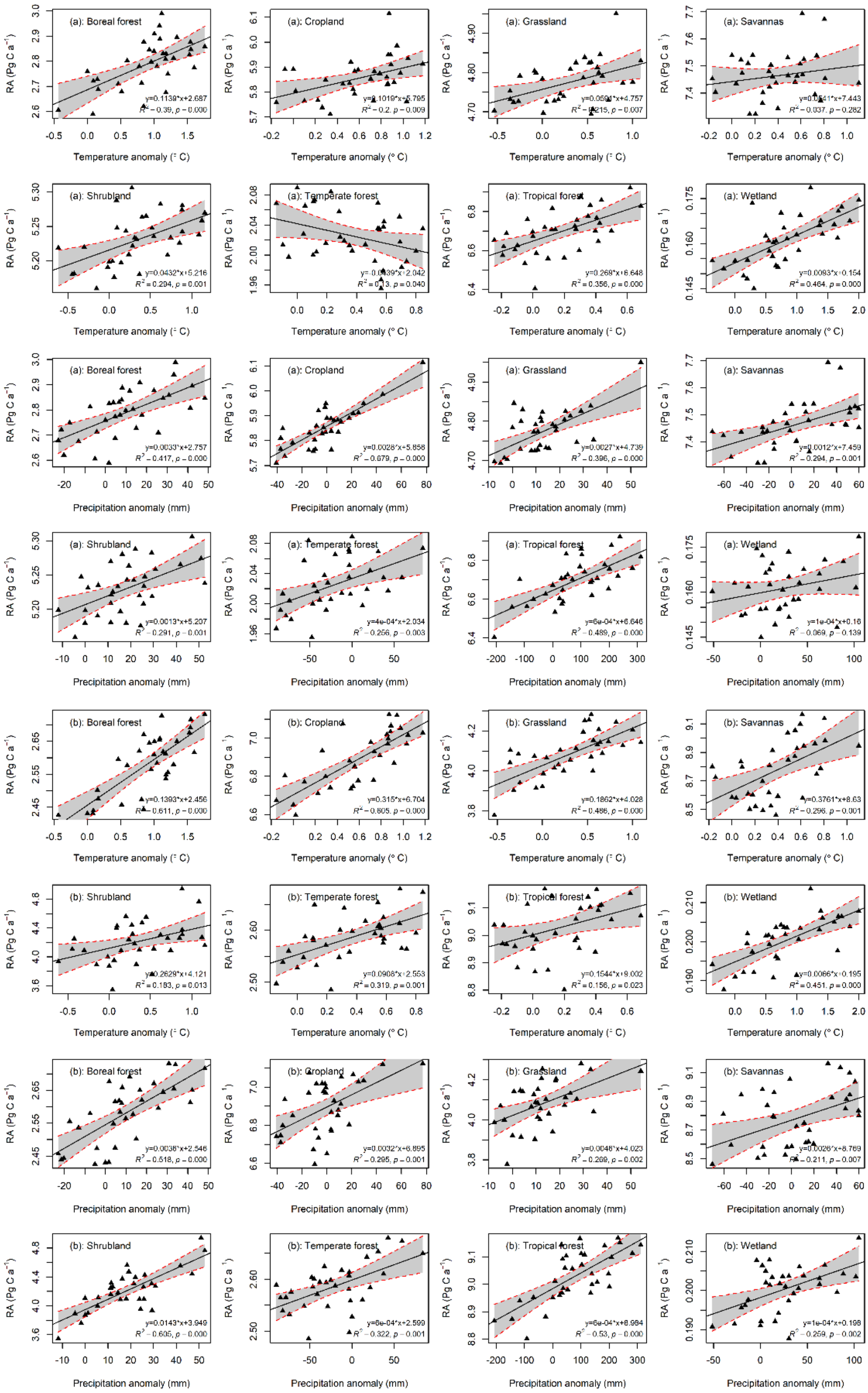

Fig. S5. The relationships between total belowground autotrophic respiration (RA) and temperature/precipitation anomaly for this study (a) and Hashimoto RA (b) for eight biomes

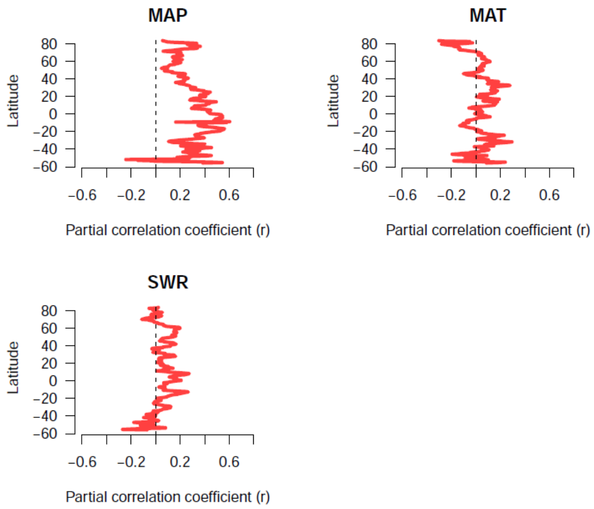

Fig. S6. Latitudinal patterns of partial correlation coefficient between RA and mean annual temperature (MAT), mean annual precipitation (MAP) and shortwave radiation (SWR).

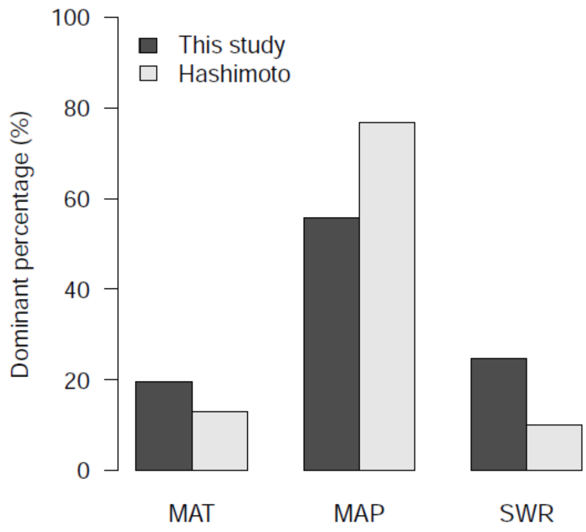

Fig. S7. The percentage of dominant factor for global RA (calculated from cell areas).

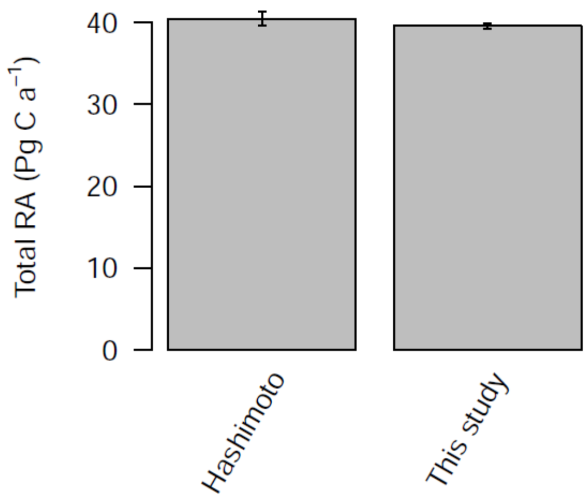

Fig. S8. Total belowground autotrophic respiration (RA) for this study and Hashimoto after masking with a same land area.

References

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