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Supplement of

Global patterns and drivers of phosphorus fractions in natural soils

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Table S1. Gridded data

Group	Variables	Brief description	Original resolution	Data source
Climate	Mean annual temperature	30-yr (1981 to 2010) annual average temperature	1 km	http://worldclim.org/bioclim
	Mean annual precipitation	30-yr (1981 to 2010) annual average precipitation	1 km	http://worldclim.org/bioclim
	Biomes	Potential Biomes	1 km	https://sedac.ciesin.columbia.edu
Soil	Total soil phosphorus	Total soil phosphorus concentration	50 km	https://doi.org/10.6084/m9.figshare.14583375
	Soil organic carbon	Soil organic carbon concentration	250 m	https://openlandmap.org
	Soil pH	Soil pH	250 m	https://openlandmap.org
	Soil clay	Soil clay content	250 m	https://openlandmap.org
	Soil sand	Soil sand content	250 m	https://openlandmap.org
	Soil order	Taxonomy soil order class	250 m	https://openlandmap.org
	Soil depth	Soil depth	10 km	http://globalchange.bnu.edu.cn/research/data
Topography	Elevation	Land surface elevation	250 m	https://openlandmap.org

Table S2. Comparison of P pool concentrations between our estimates and estimates by Yang *et al*. (2013).

	Labile Pi	Organic P	Moderately labile Pi	Primary P	Occluded P
Median					
He	29.9	157.6	46.1	95.6	215.8
Yang	27.9	69.4	26.8	89.1	104.0
Mean					
He	34.4	195.2	62.9	111.2	213.3
Yang	33.5	85.4	30.6	117.5	115.6

Figure S1. Comparison of site-level Hedley P pool measurement distributions between our database and Yang et al.'s (2013). Our database (A) contains 1838 observations, while Yang et al. (2013) (B) contains 178.

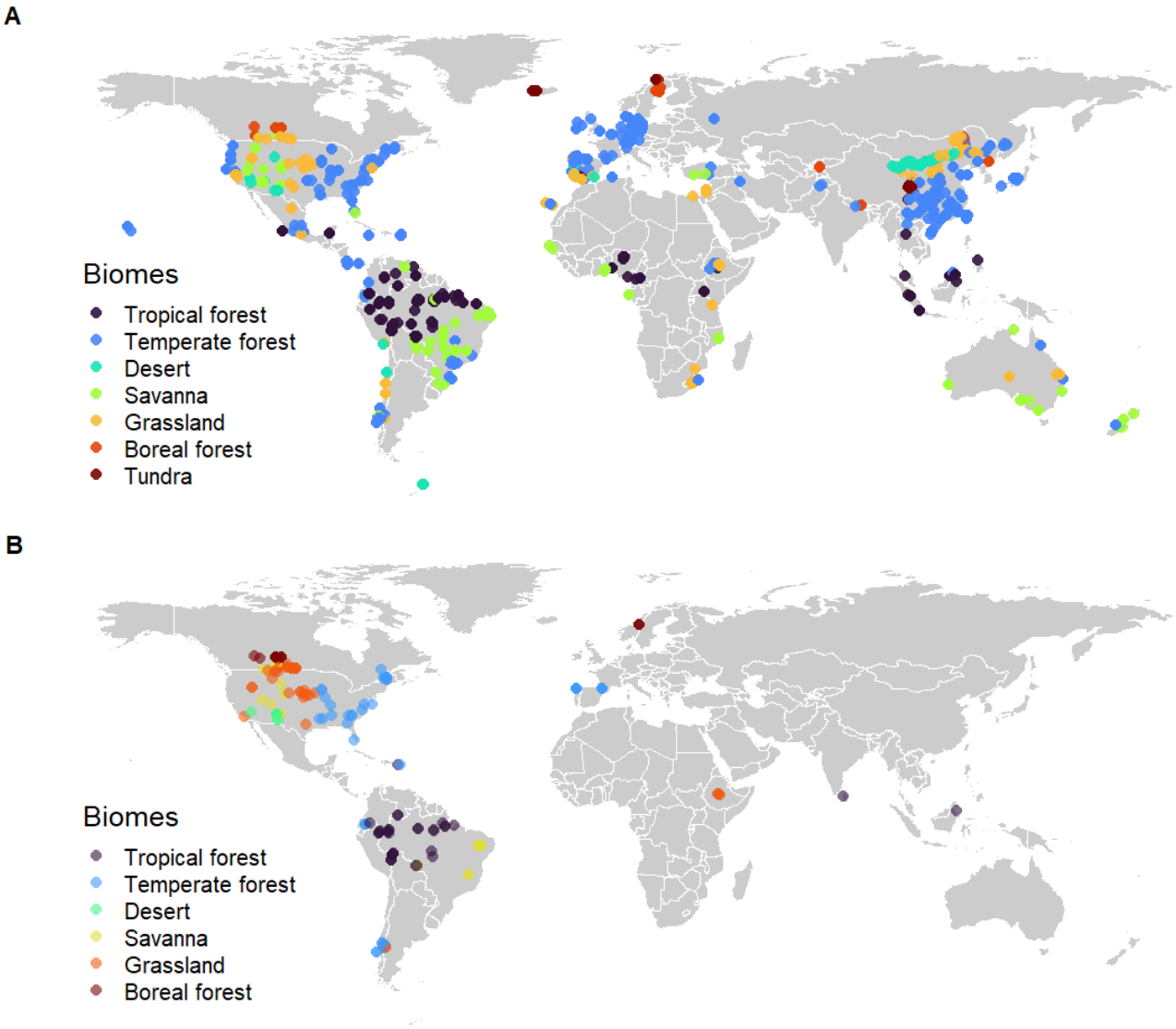


Figure S2. PRISMA flow diagram showing the procedure used for selection of studies for synthesis.

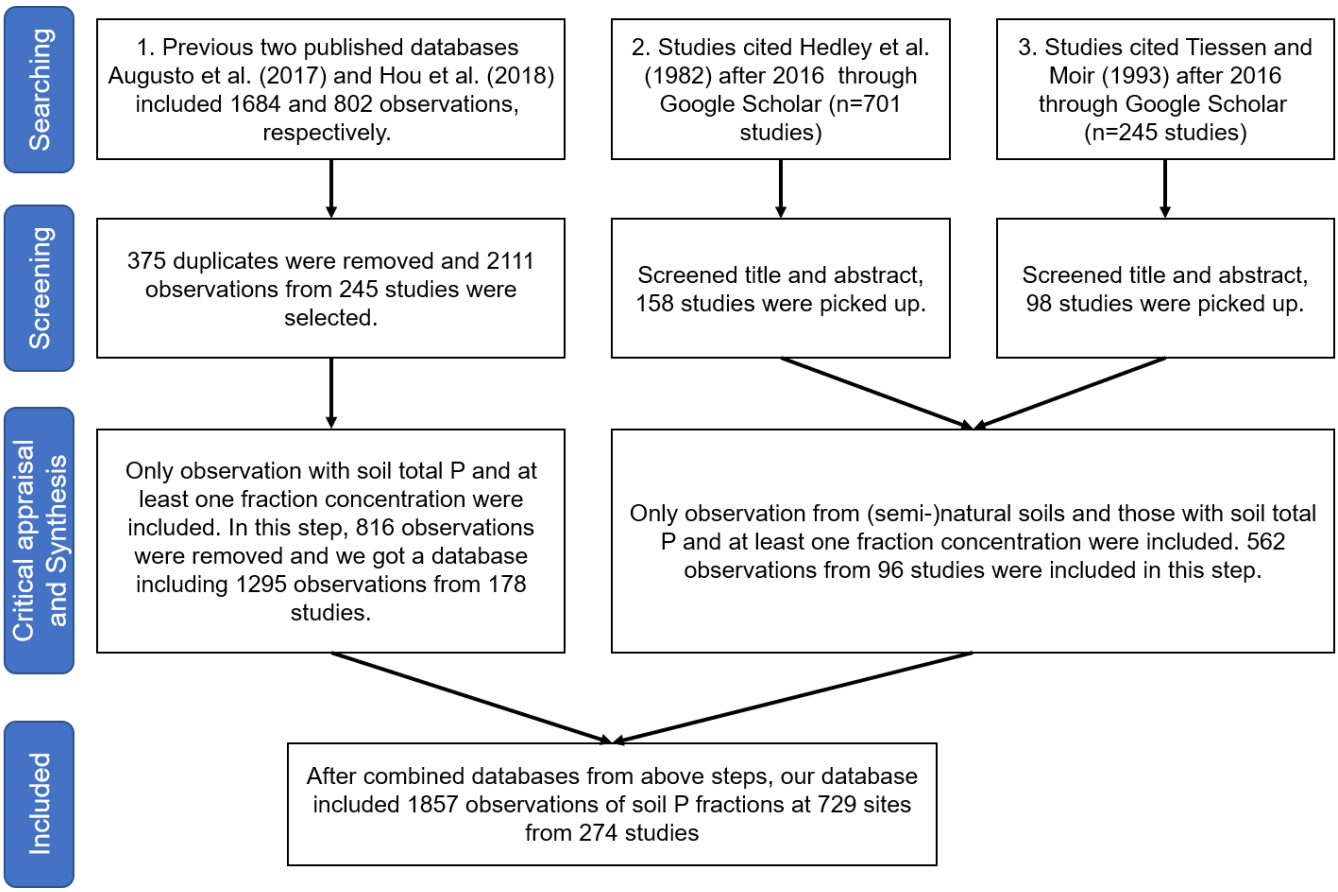


Figure S3. Partial dependence plots showing dependence of centralized soil P pool concentrations on predictors. To simplify comparison, partial dependent analysis results are centralized in this plot.

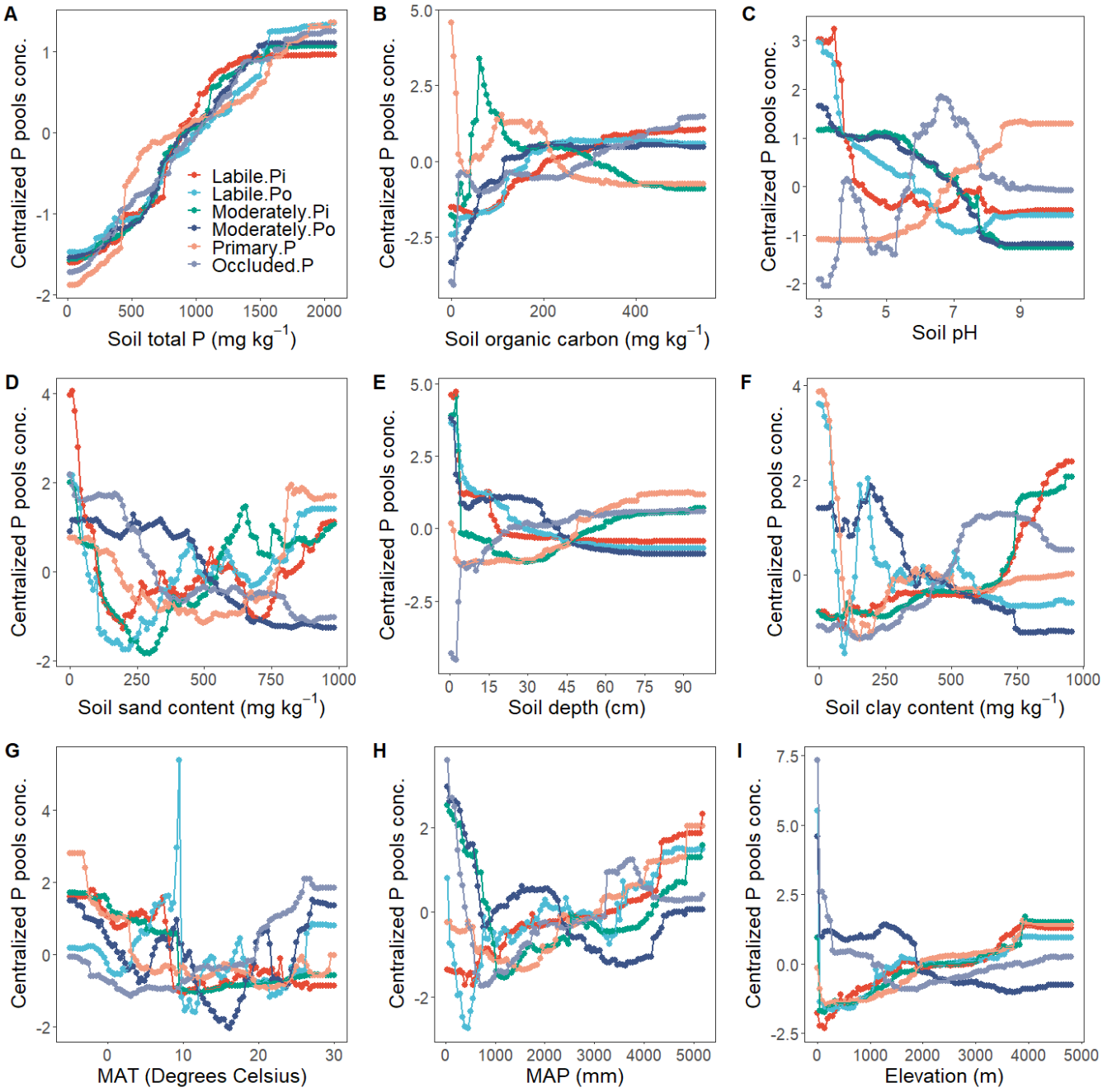


Figure S4. Relative importance of variables for predicting proportions of soil P pools quantified using random forest models. Mean decrease accuracy (%IncMSE) indicates the relative importance of each variable for predicting soil P pools. SWS: soil weathering stage.

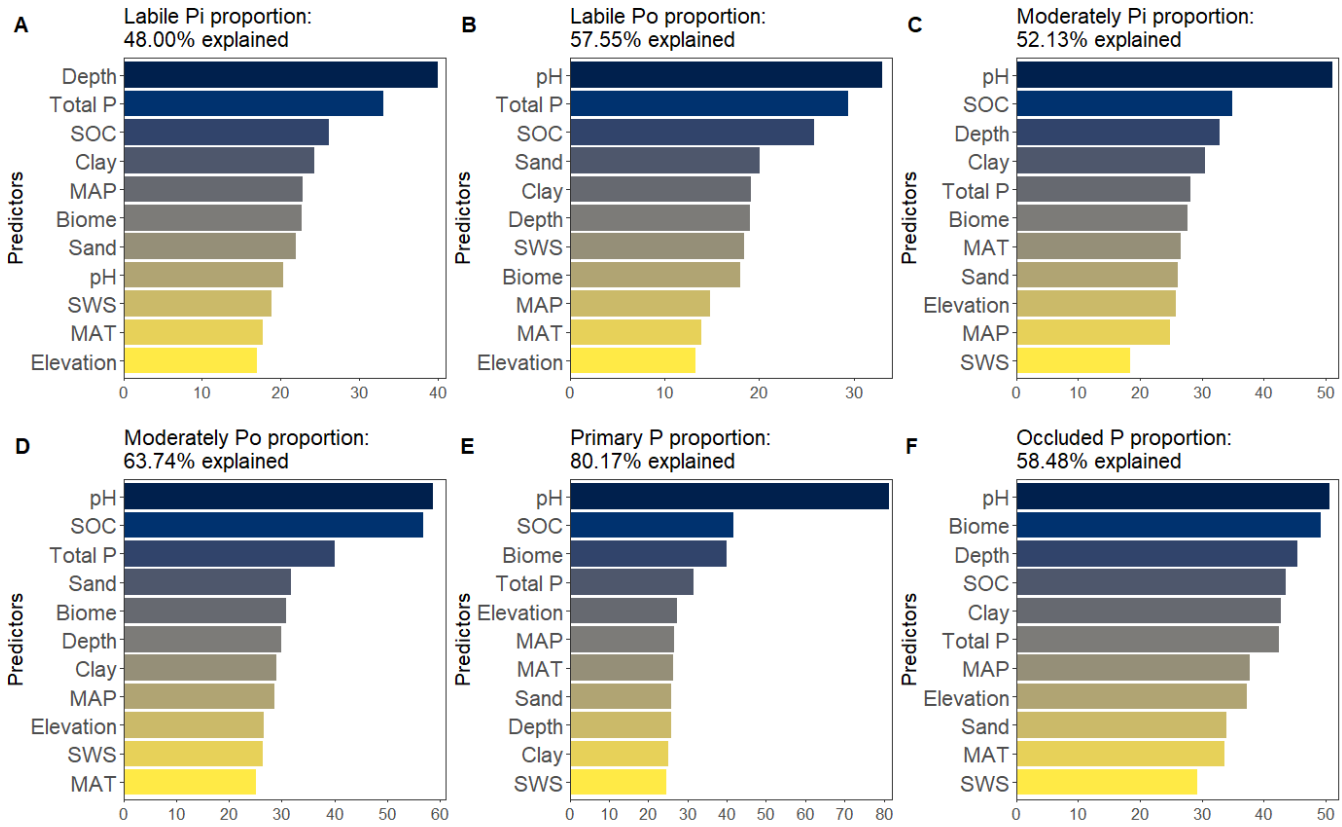


Figure S5. Average P pool concentrations and proportions of total P concentration across weathering stage and biome. Labile Po and moderately labile Po are combined into the organic pool. Results based on 1857 observations.

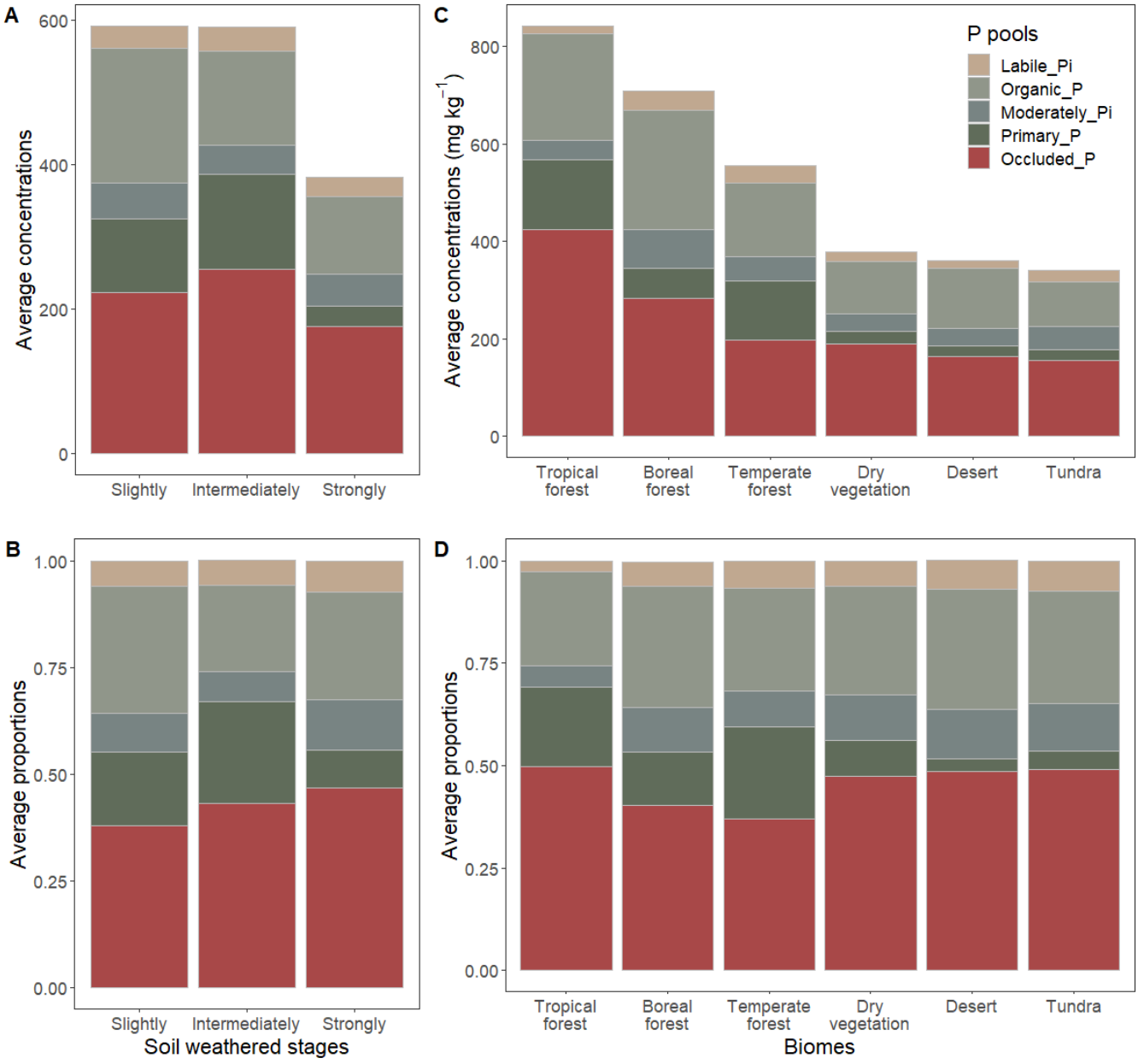
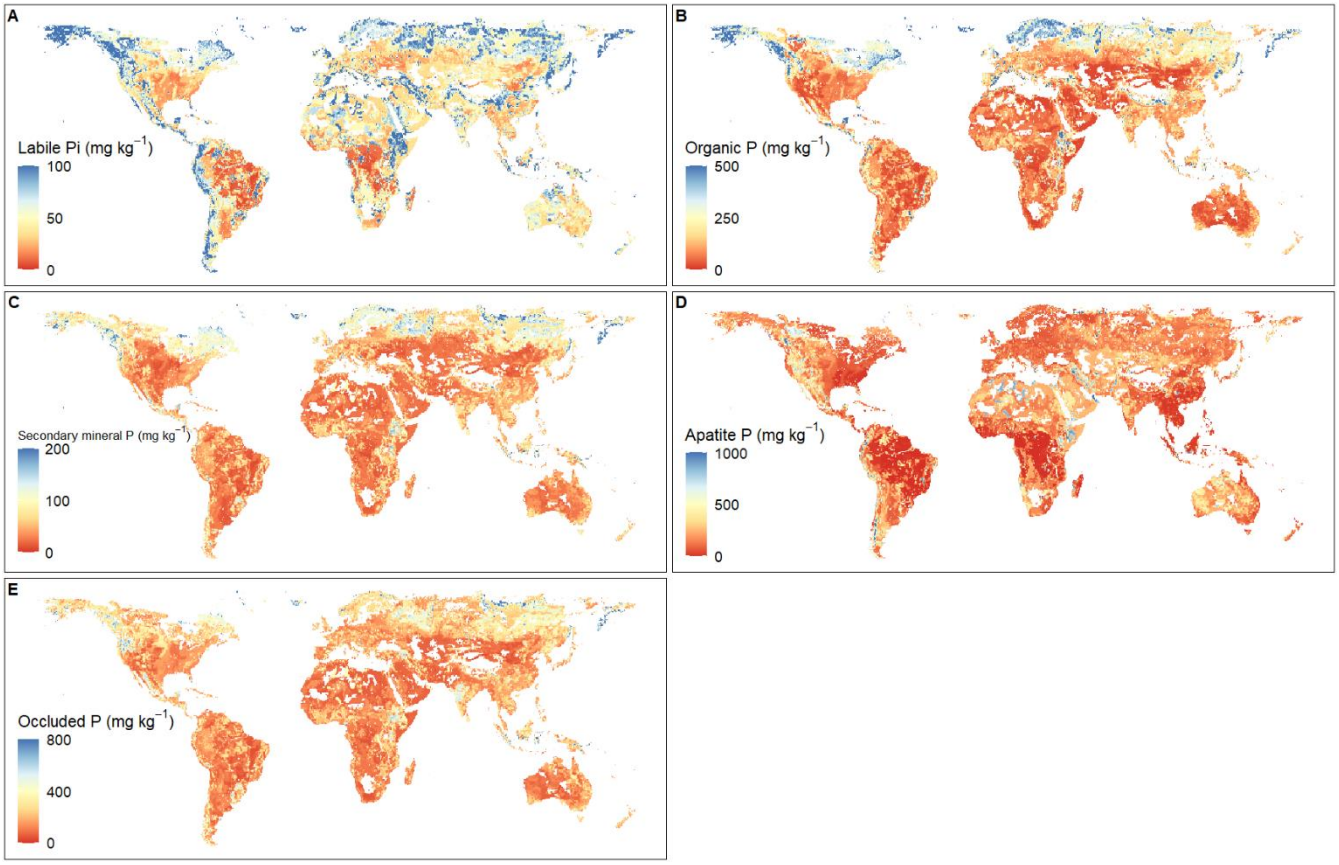


Figure S6. Yang et al. (2013)'s predictions of different P pool concentrations.



Supplementary Text 1 Data source references

Two previous databases:

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