

# Supplementary file to: Estimates of mean residence times of phosphorus in commonly-considered inorganic soil phosphorus pools

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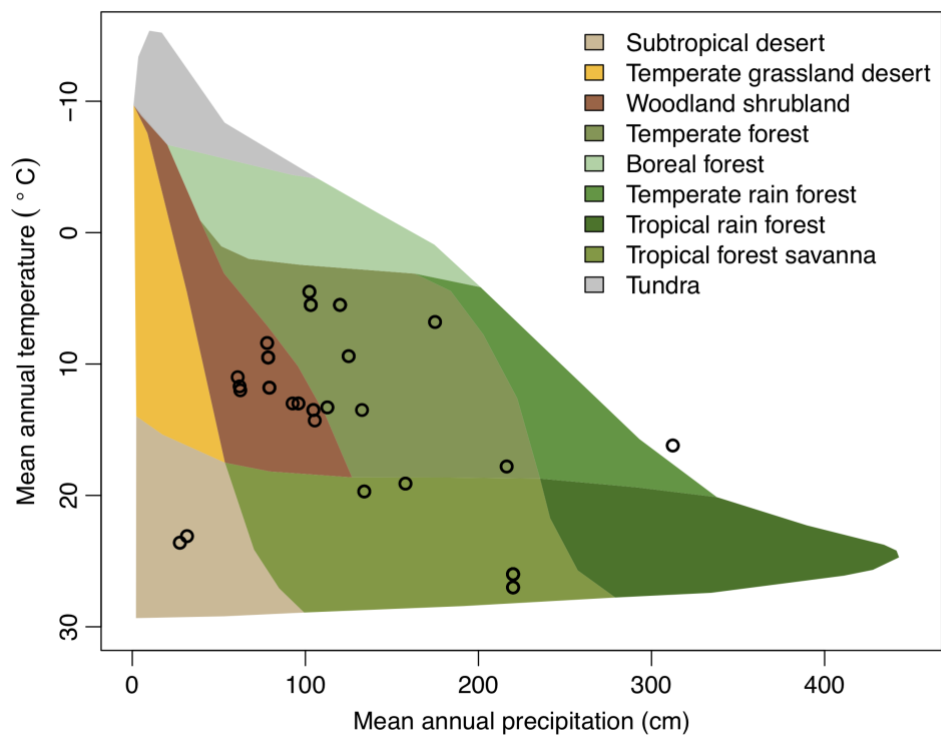
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## Supplementary figures



**Figure 1.** Whittaker's diagram showing the main biomes covered by our dataset based on mean annual temperature and mean annual precipitation.

Texture triangle: USDA

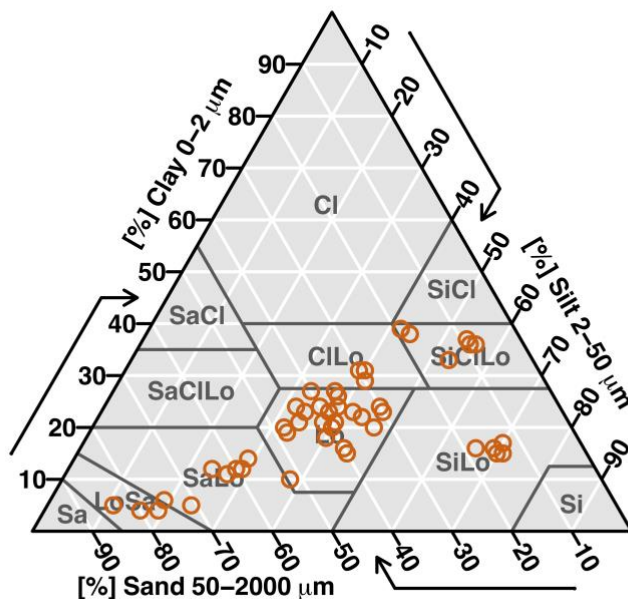
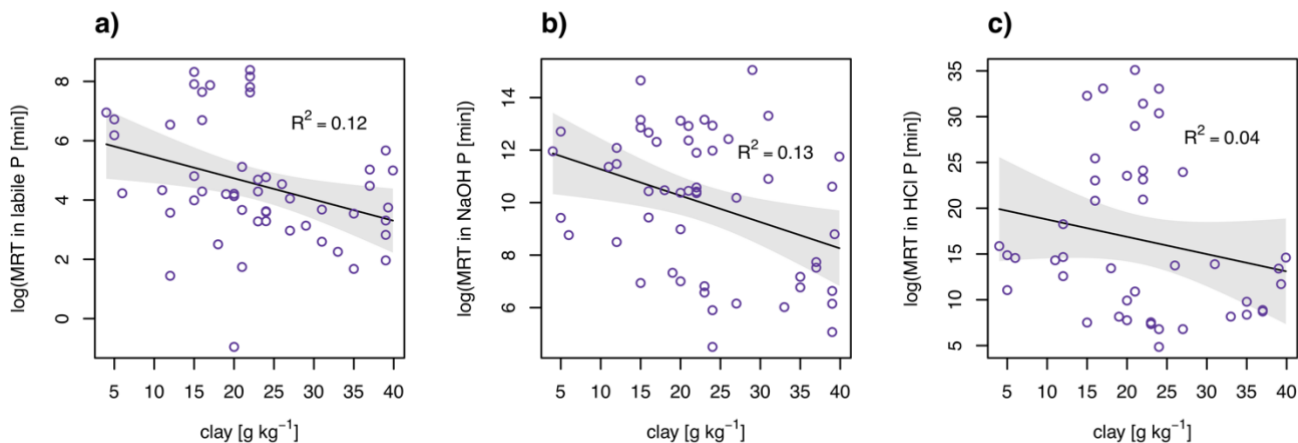


Figure 2. Soil texture triangle to determine the soil texture classes comprised in our dataset.



5 Figure 3. Simple regression of calculated mean residence time of P with clay concentration. The model was significant for labile P ( $F$ -statistic = 6.8,  $p$  = 0.01) and NaOH-P ( $F$ -statistic = 7.1,  $p$  < 0.01), but not for HCP ( $F$ -statistic = 1.8,  $p$  = 0.18).

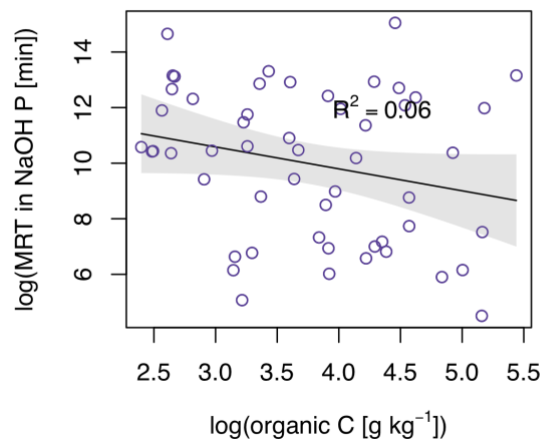
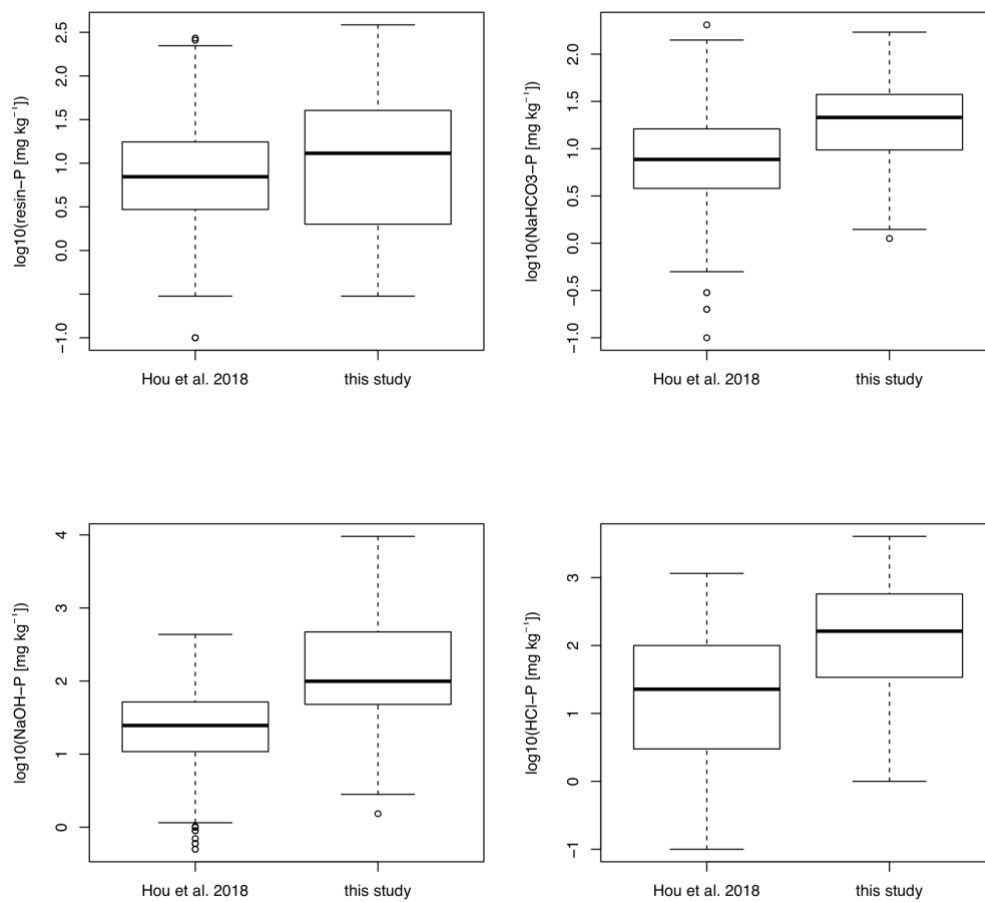
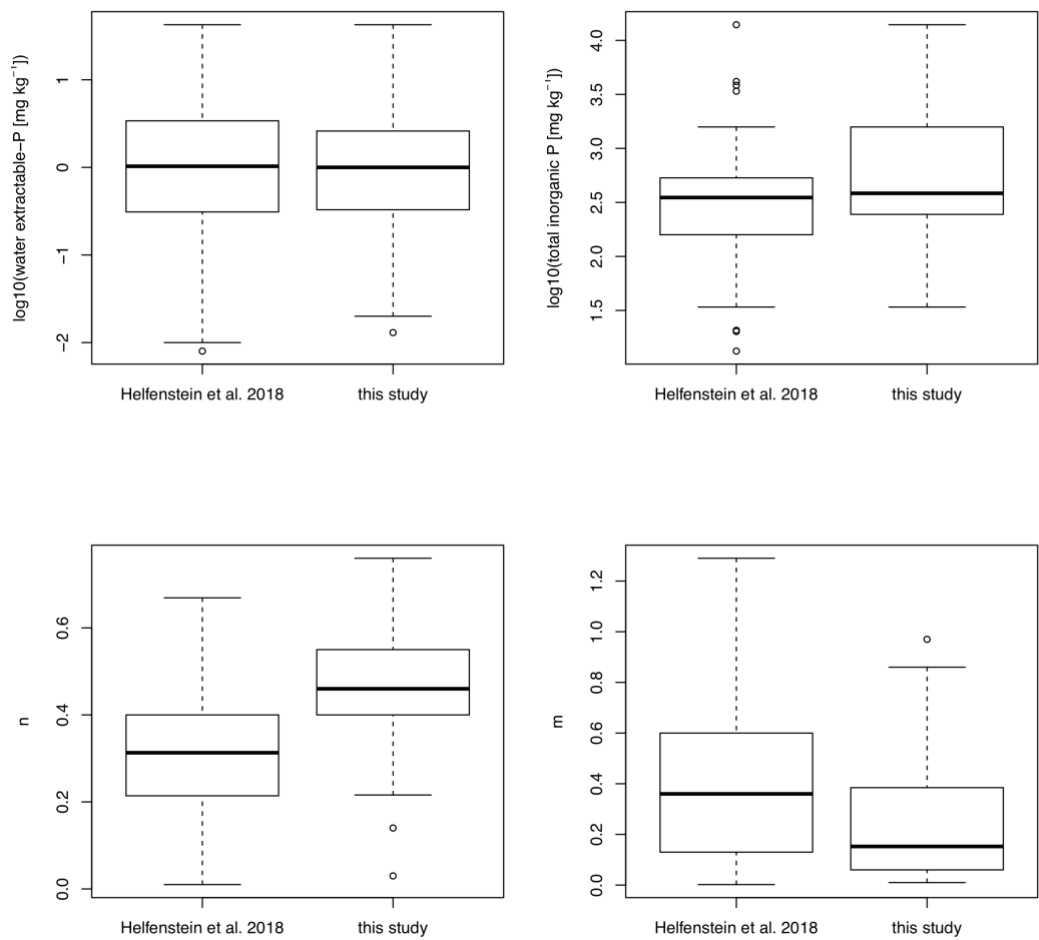


Figure 4. Simple regression of calculated mean residence time of P in NaOH-P with organic C. The model was not significant ( $F$ -statistic = 3.2,  $p = 0.08$ ).



**Figure 5. Comparison of soil P pools in this study (n = 57) and in a larger dataset (n = 802) (Hou et al., 2018).**



**Figure 6. Isotope exchange kinetic properties of this study (n = 57) in comparison to a larger dataset (n = 217) (Helfenstein et al., 2018b).**

**Table 1. Sources for data on soil and other properties for each site.**

<b>Study code</b>	<b>IEK</b>	<b>sequential. extraction</b>	<b>pH</b>	<b>soil texture</b>	<b>organic C</b>	<b>MAT</b>	<b>MAP</b>	<b>land use</b>	<b>parent material</b>
Hawaii	Helfenstein et al. 2018	Helfenstein et al. 2018	Helfenstein et al. 2018	soil grids <sup>a</sup>	Helfenstein et al. 2018	Helfenstein et al. 2018	Helfenstein et al. 2018	Helfenstein et al. 2018	Helfenstein et al. 2018
DOK	unpublished	Keller et al. 2012	Keller et al. 2012	unpublished	Keller et al. 2012	Keller et al. 2012	Keller et al. 2012	Keller et al. 2012	Keller et al. 2012
NZ	Chen et al. 2003	Chen et al. 2003	Chen et al. 2003	Chen et al. 2003	Chen et al. 2003	land-based station data (NOAA) <sup>b</sup>	land-based station data (NOAA) <sup>b</sup>	Chen et al. 2003	Chen et al. 2003
PimWald	Lang et al. 2017	Lang et al. 2017	Lang et al. 2017	Lang et al. 2017	Lang et al. 2017	SPP 1685 project webpage <sup>c</sup>	Lang et al. 2017	Lang et al. 2017	SPP 1685 project webpage <sup>c</sup>
Colombia I	Oberson et al. 1999	Oberson et al. 1999	Oberson et al. 1999	Oberson et al. 1999	Oberson et al. 1999	Oberson et al. 1999	Oberson et al. 1999	Oberson et al. 1999	Sanz-Scovino et al. 1992
Colombia II	Buehler et al. 2003	Buehler et al. 2002	Buehler et al. 2003	Buehler et al. 2002	Buehler et al. 2003	Buehler et al. 2003	Buehler et al. 2003	Buehler et al. 2003	Sanz-Scovino et al. 1992
Borda	Borda et al. 2014	Borda et al. 2014	Borda et al. 2011	soil grids <sup>a</sup>	Borda et al. 2014	Borda et al. 2014	Borda et al. 2014	Borda et al. 2014	Borda et al. 2014