



*Supplement of*

## **Observational benchmarks inform representation of soil organic carbon dynamics in land surface models**

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Table S1: Environmental variables used as predictors of global soil organic carbon stocks

	<b>Variable</b>	<b>Resolution</b>	<b>Sources</b>
1	Longitude		WoSIS
2	Latitude		WoSIS
3	Rmean (Soil Respiration)	Originally 0.5 deg, resampled to 1km	<a href="http://cse.ffpri.affrc.go.jp/shojih/data/index.html">http://cse.ffpri.affrc.go.jp/shojih/data/index.html</a>
4	ESA land cover	1 km	<a href="https://www.esa-landcover-cci.org">https://www.esa-landcover-cci.org</a>
5	Evapotranspiration	Originally 1 deg, resampled to 1km	<a href="https://www.ntsug.umt.edu/project/global-et.php">https://www.ntsug.umt.edu/project/global-et.php</a>
6	IGBP types	Originally 0.5 deg, resampled to 1km	IGBP website
7	Soil types	Originally 0.083 deg, resampled to 1km	FAO-UNESCO
8	NPP mean	1km	(Zhao et al. 2005)
9	NPP max	1km	(Zhao et al. 2005)
10	NPP min	1km	(Zhao et al. 2005)
11	Vegetation cover types	Originally 0.5 deg, resampled to 1km	(Channan et al. 2014)
12	Annual Mean Temperature	1km	(Fick and Hijmans 2017)
13	Mean Diurnal Range Temperature	1km	(Fick and Hijmans 2017)
14	Isothermality	1km	(Fick and Hijmans 2017)
15	Temperature Seasonality	1km	(Fick and Hijmans 2017)
16	Max Temperature of Warmest Month	1km	(Fick and Hijmans 2017)
17	Min Temperature of Coldest Month	1km	(Fick and Hijmans 2017)
18	Temperature Annual Range	1km	(Fick and Hijmans 2017)
19	Mean Temperature of Wettest Quarter	1km	(Fick and Hijmans 2017)
20	Mean Temperature of Driest Quarter	1km	(Fick and Hijmans 2017)
21	Mean Temperature of Warmest Quarter	1km	(Fick and Hijmans 2017)
22	Mean Temperature of Coldest Quarter	1km	(Fick and Hijmans 2017)
23	Annual Precipitation	1km	(Fick and Hijmans 2017)
24	Precipitation of Wettest Month	1km	(Fick and Hijmans 2017)
25	Precipitation of Driest Month	1km	(Fick and Hijmans 2017)
26	Precipitation Seasonality	1km	(Fick and Hijmans 2017)
27	Precipitation of Wettest Quarter	1km	(Fick and Hijmans 2017)
28	Precipitation of Driest Quarter	1km	(Fick and Hijmans 2017)
29	Precipitation of Warmest Quarter	1km	(Fick and Hijmans 2017)

30	Precipitation of Coldest Quarter	1km	(Fick and Hijmans 2017)
31	Absolute Depth to Bedrock	Originally 250m, resampled to 1km	(Hengl et al. 2017)
32	Cation exchange capacity	Originally 250m, resampled to 1km	(Hengl et al. 2017)
33	Clay content	Originally 250m, resampled to 1km	(Hengl et al. 2017)
34	Coarse fragment fraction	Originally 250m, resampled to 1km	(Hengl et al. 2017)
35	Bedrock depth	Originally 250m, resampled to 1km	(Hengl et al. 2017)
36	Grade acid	Originally 250m, resampled to 1km	(Hengl et al. 2017)
37	Occurrence R horizon	Originally 250m, resampled to 1km	(Hengl et al. 2017)
38	pH water	Originally 250m, resampled to 1km	(Hengl et al. 2017)
39	Sand content	Originally 250m, resampled to 1km	(Hengl et al. 2017)
40	Silt content	Originally 250m, resampled to 1km	(Hengl et al. 2017)
41	SWC v wilting point	Originally 250m, resampled to 1km	(Hengl et al. 2017)
42	Texture	Originally 250m, resampled to 1km	(Hengl et al. 2017)
43	USDA suborder	Originally 250m, resampled to 1km	(Hengl et al. 2017)
44	WRB subgroup	Originally 250m, resampled to 1km	(Hengl et al. 2017)
45	Drought	Originally 2.50 deg, resampled to 1km	(Dai et al. 2004)
46	Elevation	Originally 1arc min, resampled to 1km	NOAA, <a href="https://www.ngdc.noaa.gov/mgg/global/">https://www.ngdc.noaa.gov/mgg/global/</a>

## References

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