



Supplement of

Global patterns of soil organic carbon distribution in the 20–100 cm soil profile for different ecosystems: a global meta-analysis

Haiyan Wang et al.

Correspondence to: Yulong Yin (yinyulong88221@163.com)

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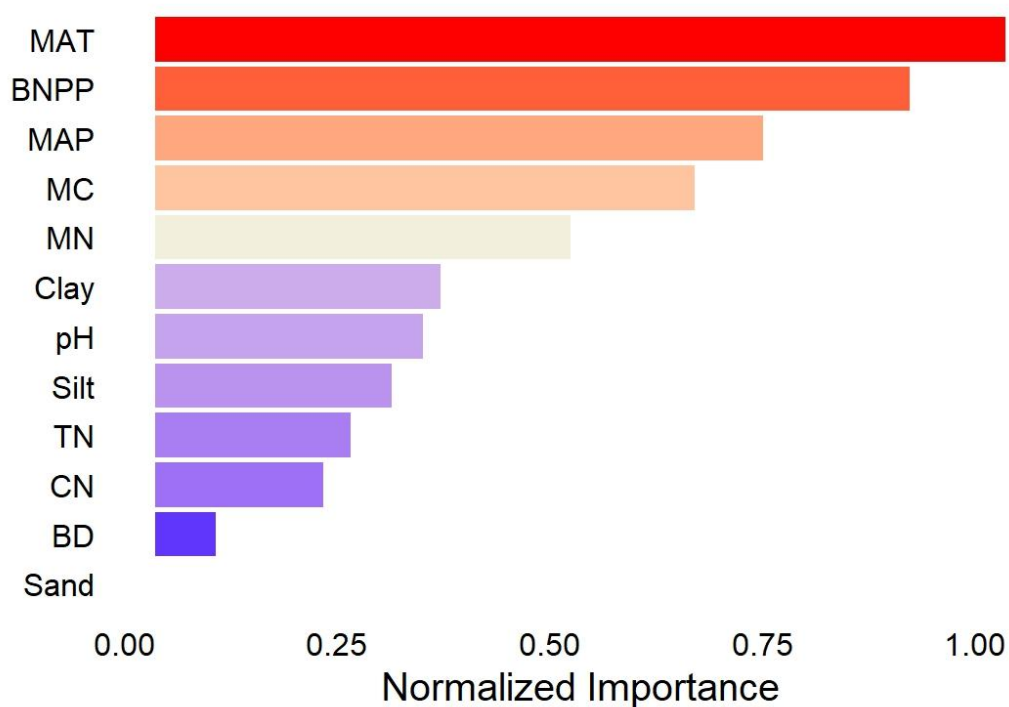


Figure S1. The importance of soil β predictors was normalized to the range [0, 1] based on the random forest algorithm, and the average normalized importance was calculated.

MAT, mean annual temperature; MAP, mean annual precipitation; BNPP, belowground net primary productivity; TN, soil total nitrogen; CN, the ratio of soil organic carbon (SOC) to total nitrogen (TN); MC, microbial biomass carbon; MN, microbial biomass nitrogen; pH, soil pH; Clay, soil clay content. Silt, soil silt content; Sand, soil sand content; BD, soil bulk density.

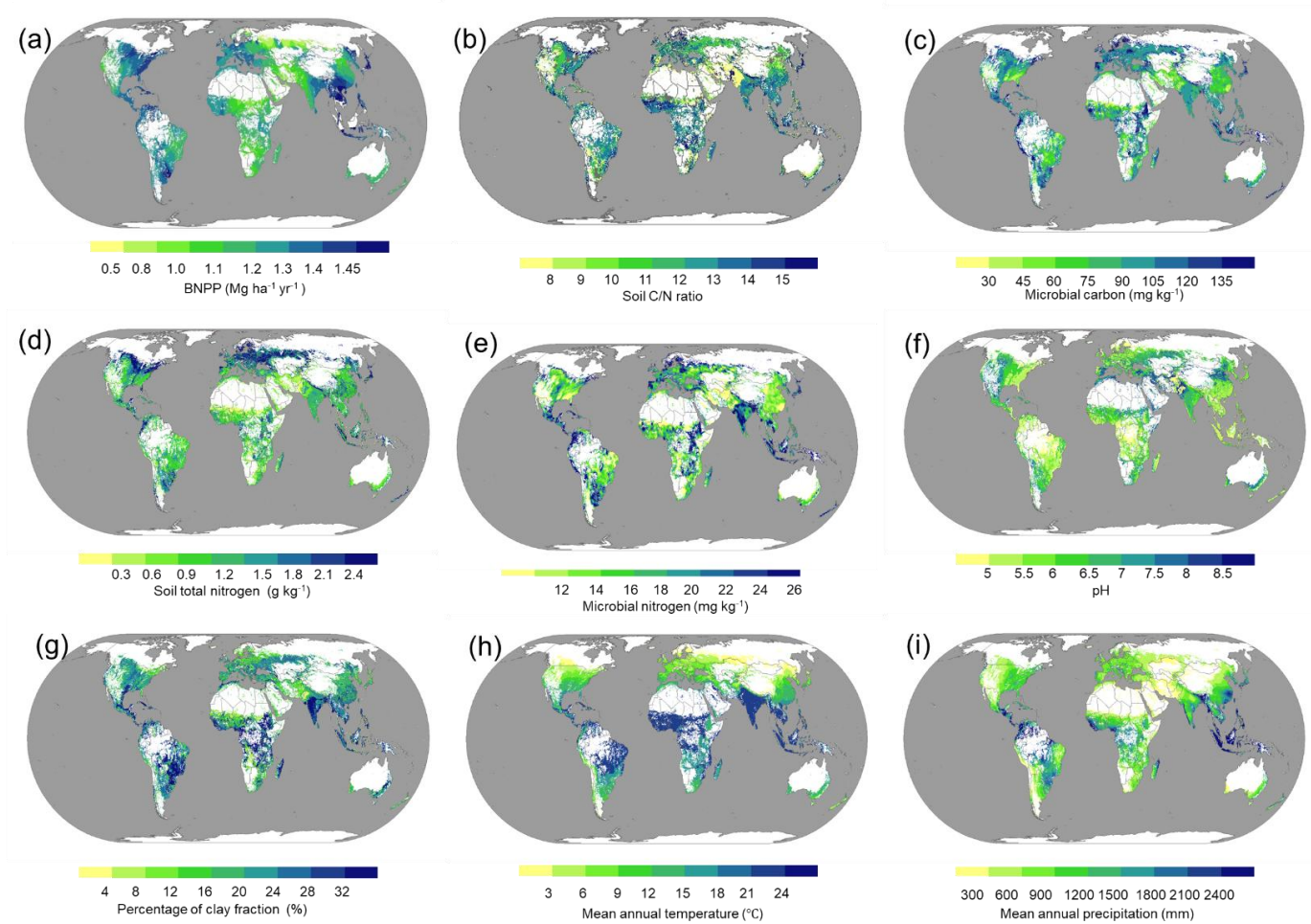


Figure S2. Cropland: Belowground net primary productivity (a), soil C/N ratio (b), microbial carbon (c), soil total nitrogen (d), microbial nitrogen (e), pH, soil pH (f), percentage of clay fraction (g), mean annual temperature (h), mean annual precipitation (i).

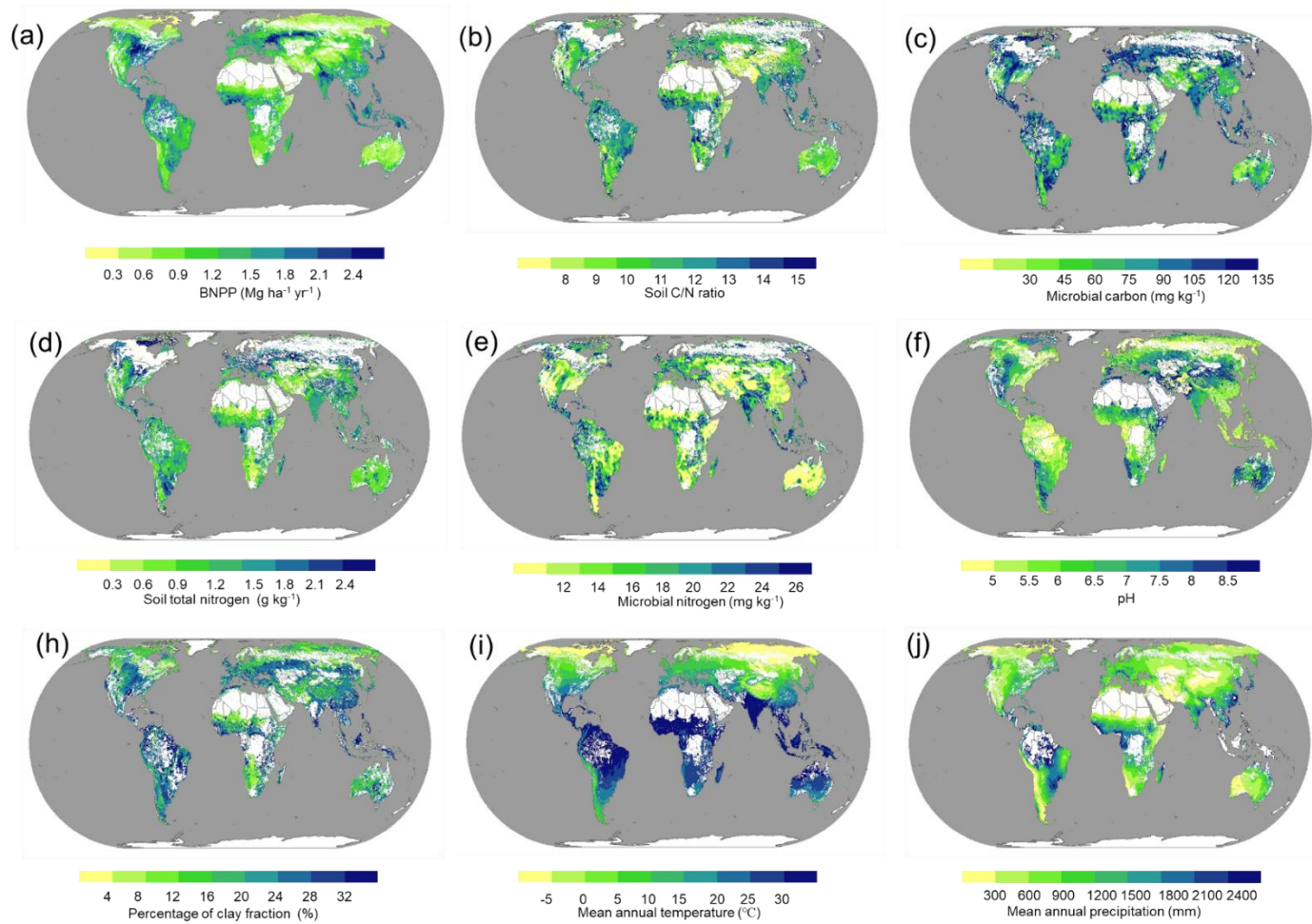


Figure S3. Grassland: Belowground net primary productivity (a), soil C/N ratio (b), microbial carbon (c), soil total nitrogen (d), microbial nitrogen (e), pH, soil pH (f), percentage of clay fraction (g), mean annual temperature (h), mean annual precipitation (i).

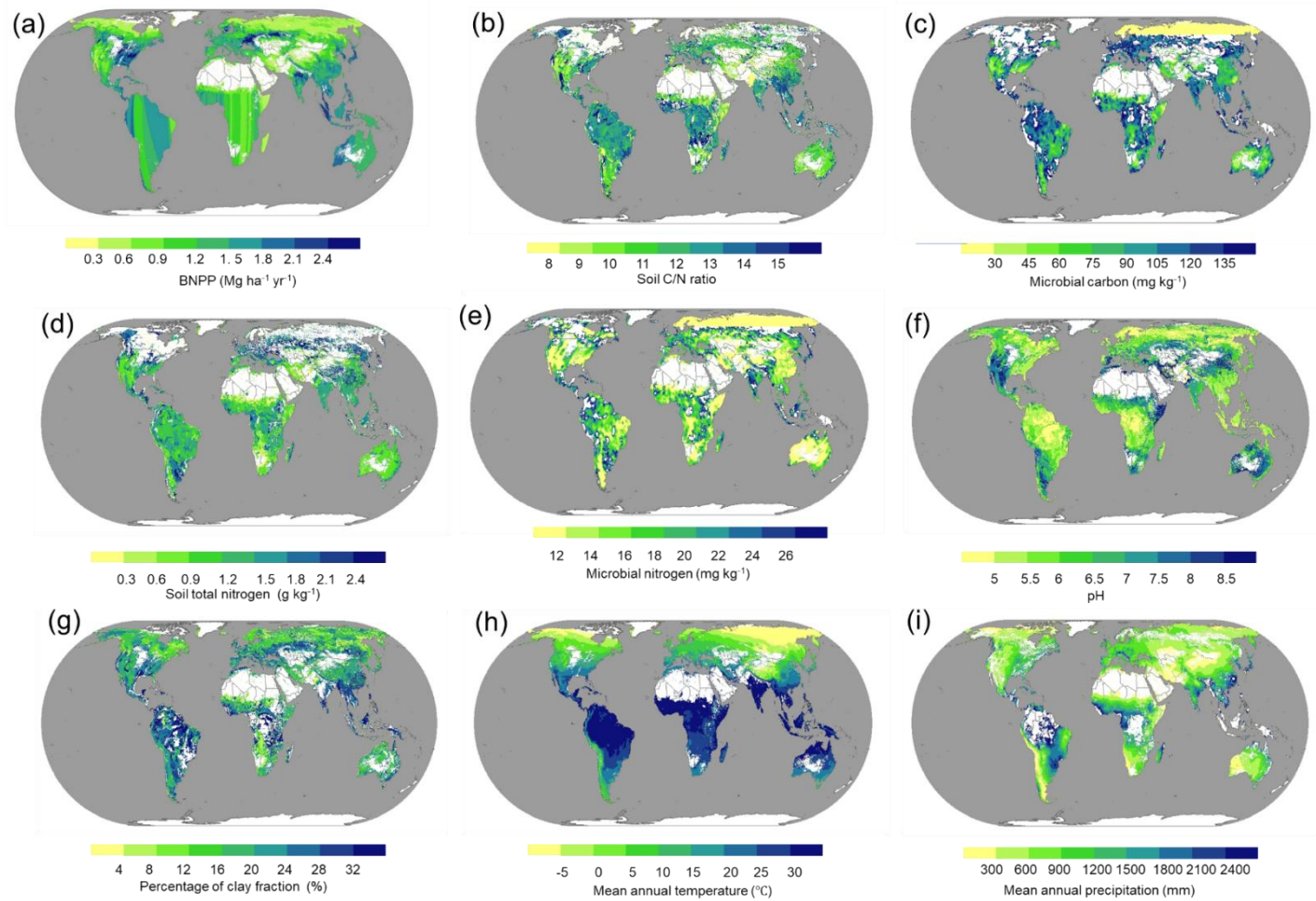


Figure S4. Forestland: Belowground net primary productivity (a), soil C/N ratio (b), microbial carbon (c), soil total nitrogen (d), microbial nitrogen (e), pH, soil pH (f), percentage of clay fraction (g), mean annual temperature (h), mean annual precipitation (i).

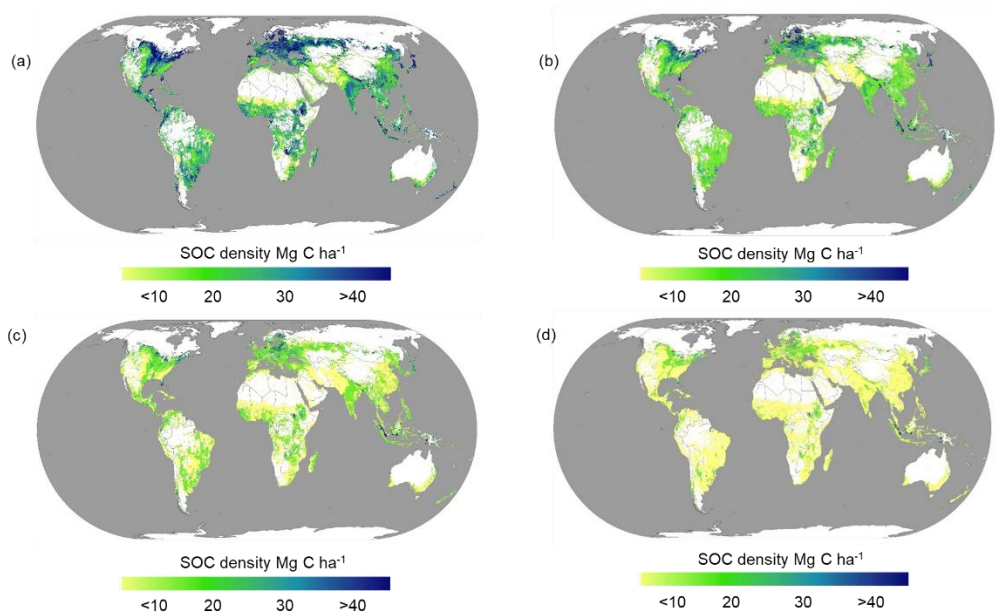


Figure S5. Grid-level maps showing the predicted global soil profiles SOC density of the cropland, **a-d** represent the 20–40 cm, 40–60 cm, 60–80 cm, 80–100 cm layer, respectively.

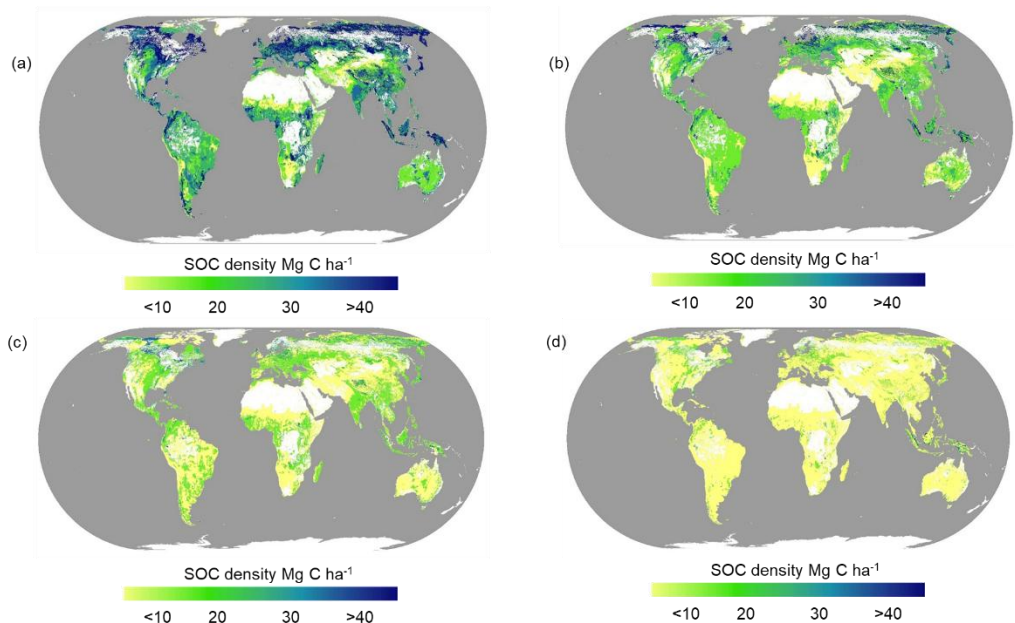


Figure S6. Grid-level maps showing the predicted global soil profiles SOC density of the grassland, **a-d** represent the 20–40 cm, 40–60 cm, 60–80 cm, 80–100 cm layer, respectively.

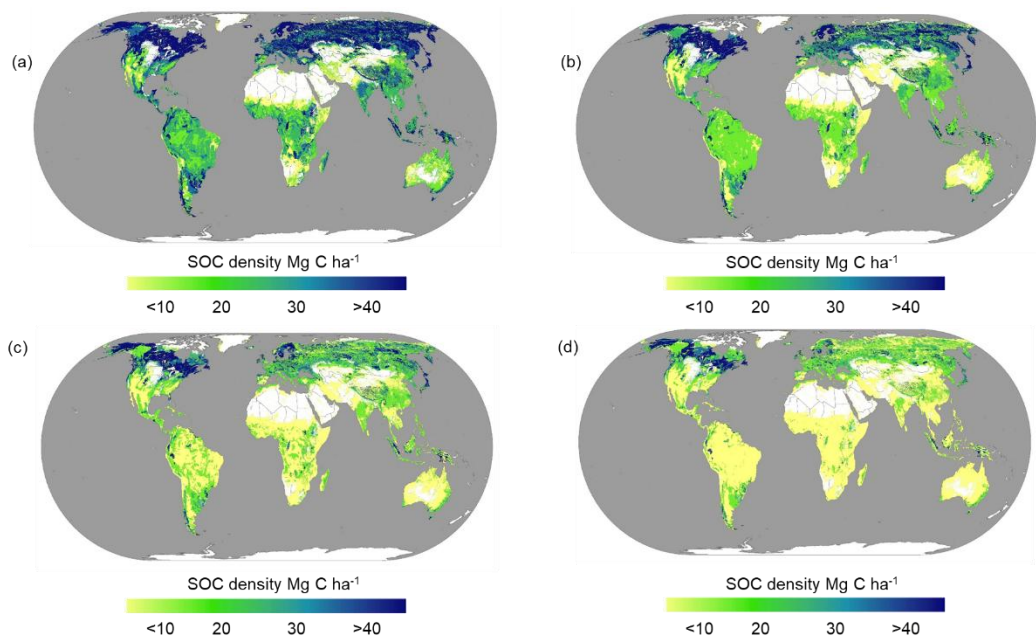


Figure S7. Grid-level maps showing the predicted global soil profiles SOC density of the forestland, **a-d** represent the 20–40 cm, 40–60 cm, 60–80 cm, 80–100 cm layer, respectively.

Table S1. Comparisons of estimated SOC density with other studies

	Topsoil (Mg ha ⁻¹) 0-30 (0-20) (cm)	Subsoil (Mg ha ⁻¹) 30-100 (20-100) (cm)	Total (Mg ha ⁻¹) 0-100 (cm)	References
Cropland	41	48	89	Liu et al., 2021
Tropical cropland	85	184	269	Reichenbach et al., 2023
Paddy	51	57	108	Liu et al., 2021
Cropland	49	62 (95% CI:52-73)	111 (95% CI:101-122)	This study
Forestland	87	102	189	Dixon et al., 1994
Tropical forestland	91	189	280	Reichenbach et al., 2023
Mangrove	130	153	283	Atwood et al., 2017
Forestland	70	97 (95% CI:80-117)	177 (95% CI:150-187)	This study
Grassland	38	44	82	Conant et al., 2017
Grassland	62	70 (95% CI:57-83)	132 (95% CI:119-145)	This study
All land	45	53	98	Hiederer et al., 2011
All land	60	76 (95% CI:63-91)	136 (95% CI:123-151)	This study