



Supplement of

A 1 km resolution soil organic carbon dataset for frozen ground in the Third Pole

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Table S1 Environmental indicators for SOCS mapping in this study

Type	Indicators	Resolution	Source
Topography	Elevation (H)		
	Slope (S)		
	Aspect (A)		
	Plan curvature (PlanC)		
	Profile curvature (ProC)		
	Topographic wetness index (TWI)		
	Total catchment area (TCA)	1000 m	http://datamirror.csdb.cn
	Relative slope position (RSP)		
	Slope length and steepness factor (LS)		
	Convergence index (CI)		
	Channel network base level (CNB)		
	Channel network distance (CND)		
	Valley depth (VD)		
	Closed depressions (CD)		
Vegetation	Normalized difference vegetation index (NDVI)		http://modis.gsfc.nasa.gov/
	Net primary productivity (NPP)	1000 m	
	Leaf area index (LAI)		http://www.geodata.cn
Climate	Mean annual precipitation (MAP)	1000 m	https://www.worldclim.org
	Mean annual temperature (MAT)		
Soil	Sand content (Sand)		
	Silt content (Silt)	250 m	http://www.isric.org
	Clay content (Clay)		

Table S2 Correlation coefficient of each environmental factor and SOCS

	<i>SOCS</i>	<i>H</i>	<i>S</i>	<i>A</i>	<i>PlanC</i>	<i>ProC</i>	<i>TWI</i>	<i>TCA</i>	<i>RSP</i>	<i>LS</i>	<i>CI</i>	<i>CNB</i>	<i>CND</i>	<i>VD</i>	<i>CD</i>	<i>NDVI</i>	<i>NPP</i>	<i>LAI</i>	<i>MAP</i>	<i>MAT</i>	<i>Sand</i>	<i>Silt</i>	
<i>SOCS</i>	1																						
<i>H</i>	-0.23**	1																					
<i>S</i>	0.15**	-0.15**	1																				
<i>A</i>	-0.01	-0.03	-0.07	1																			
<i>PlanC</i>	0.01	0.14**	-0.09*	-0.10*	1																		
<i>ProC</i>	0.04	0.12**	-1.34**	-0.05	-0.27**	1																	
<i>TWI</i>	-0.26**	0.14**	-0.48**	0.10*	-0.08*	-0.12**	1																
<i>TCA</i>	-0.14**	0.09*	-0.02	0.06	-0.05	-0.07	0.40**	1															
<i>RSP</i>	-0.30**	0.12**	0.30	0.08*	0.08*	0.30**	-0.54**	-0.13**	1														
<i>LS</i>	0.05	-0.12**	0.72**	0.01	-0.24**	-0.14**	-0.17**	0.12**	0.10*	1													
<i>CI</i>	0.03	0.03	0.09*	0.09*	0.57**	0.18**	-0.26**	-0.11**	0.20**	-0.03	1												
<i>CNB</i>	-0.21**	0.18**	-0.22**	0.06	0.03	-0.07	0.64**	0.21**	-0.32**	-0.20**	-0.05	1											
<i>CND</i>	-0.28**	0.96**	-0.28**	-0.03	0.12**	0.01	0.28**	0.12**	-0.11*	-0.19**	-0.01	0.28**	1										
<i>VD</i>	-0.21**	-0.04	0.48**	0.03	0.03	0.40**	-0.46**	-0.10*	0.77**	-0.19**	0.13**	-0.24**	-0.32**	1									
<i>CD</i>	-0.07	-0.73**	0.37**	0.01	-0.23**	-0.18**	-0.03	0.02	-0.29**	0.26**	-0.07	-0.01	-0.71**	0.09	1								
<i>NDVI</i>	0.73**	-0.44**	0.24**	0.09*	-0.12**	-0.08	-0.25**	-0.18**	0.20**	0.38**	-0.08	-0.25**	-0.47**	0.19**	0.21**	1							
<i>NPP</i>	0.69**	-0.40**	0.21**	0.07	-0.09*	-0.01	-0.25**	-0.19**	0.24**	0.16**	-0.08	-0.26**	-0.45**	0.24**	0.11*	0.92**	1						
<i>LAI</i>	0.64**	-0.41**	0.32**	0.06	-0.16**	-0.09*	-0.19**	-0.13**	0.11*	0.14**	-0.11*	-0.14**	-0.47**	0.20**	0.30**	0.90**	0.81**	1					
<i>MAP</i>	0.41**	-0.35**	0.42**	0.09*	-0.17**	-0.02	-0.25**	-0.15**	0.18**	0.23**	-0.02	-0.20**	-0.43**	0.35**	0.43**	0.67**	0.62**	0.69**	1				
<i>MAT</i>	0.22**	-0.79**	0.22**	0.08*	-0.18**	-0.15**	-0.01	-0.02	-0.34**	0.32**	-0.03	0.12**	-0.68**	-0.03	0.85**	0.24**	0.17**	0.32**	0.39**	1			
<i>Sand</i>	-0.14**	-0.41**	-0.12**	0.07	-0.01	-0.11**	0.12**	0.04	-0.14**	0.18**	0.04	0.15**	0.44**	-0.20**	-0.19**	-0.15**	-0.16**	-0.22**	-0.02	-0.12**	1		
<i>Silt</i>	0.20**	-0.34**	0.04	-0.03	0.02	-0.21**	-0.07	-0.02	-0.05	-0.06	-0.06	-0.17**	-0.28**	-0.15**	0.16**	0.27**	0.20**	0.30**	0.04	0.04	-0.65**	1	
<i>Clay</i>	0.02	-0.53**	-1.12**	0.04	0.02	-0.10**	0.02	-0.04	-0.15**	-0.13**	-0.03	-0.01	-0.44**	-0.20**	0.31**	0.09	0.05	0.11*	-0.06	0.32**	-0.61**	0.52**	1

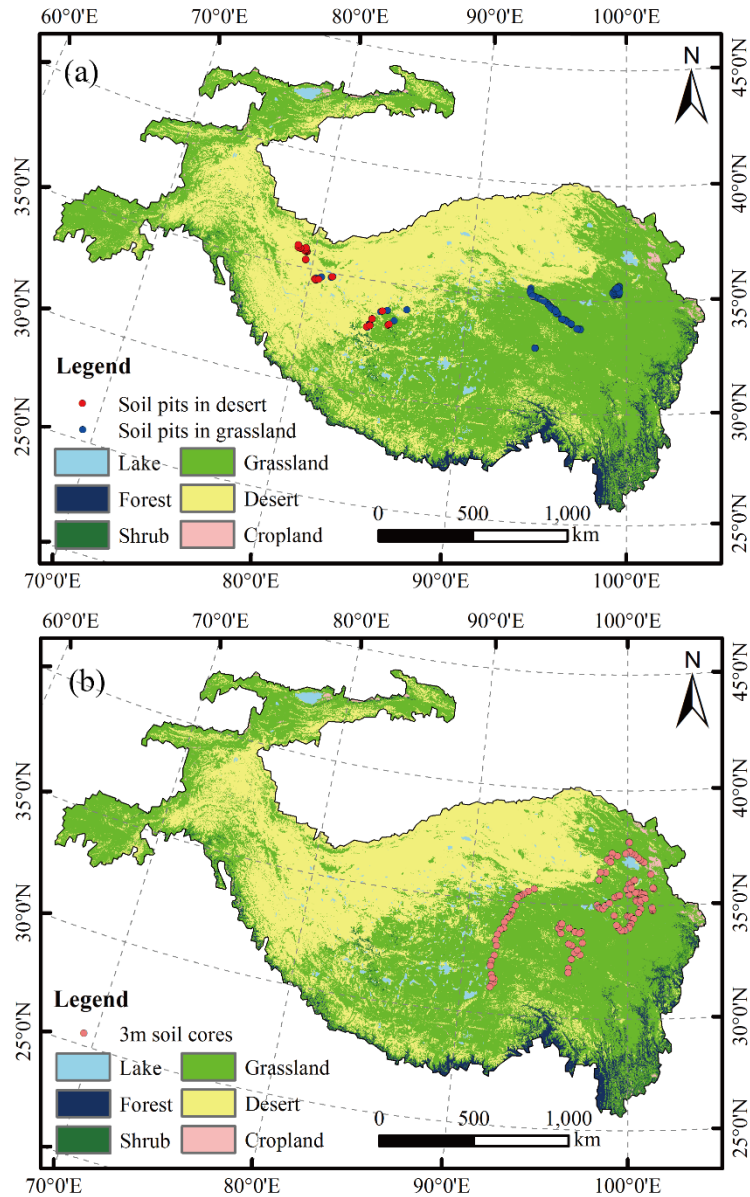


Figure S1. Spatial distribution of (a) soil pits (0–2 m), and (b) soil cores (0–3 m) in different vegetation types. The vegetation map is derived from the Land Cover Type Climate Modelling Grid (CMG) product (MCD12C1) in 2010 (<https://lpdaac.usgs.gov>).