

Table S1. Environmental variables used in this study

Category	Variable	Description	Unit
Climate	bio1	Annual Mean Temperature	°C
	bio2	Mean Diurnal Range (mean of monthly (max temp-min temp))	°C
	bio3	Isothermality (bio2/bio7) (*100)	/
	bio4	Temperature Seasonality (standard deviation*100)	/
	bio5	Max Temperature of the Warmest Month	°C
	bio6	Min Temperature of the Coldest Month	°C
	bio7	Temperature Annual Range (bio5- bio6)	°C
	bio8	Mean Temperature of the Wettest Quarter	°C
	bio9	Mean Temperature of the Driest Quarter	°C
	bio10	Mean Temperature of the Warmest Quarter	°C
	bio11	Mean Temperature of the Coldest Quarter	°C
	bio12	Annual Precipitation	mm
	bio13	Precipitation of the Wettest Month	mm
	bio14	Precipitation of the Driest Month	mm
	bio15	Precipitation Seasonality (coefficient of variation)	/
	bio16	Precipitation of the Wettest Quarter	mm
	bio17	Precipitation of the Driest Quarter	mm
	bio18	Precipitation of the Warmest Quarter	mm
	bio19	Precipitation of the Coldest Quarter	mm
Topography	Elevation		m
	Slope		°
	Aspect		rad
Soil	t-AWC	Topsoil-Available Water Capacity	%
	t-texture	Topsoil Soil Texture	/
	t-bulk	Topsoil Bulk Density	kg/dm ³
	t-ph	Topsoil pH (H ₂ O)	/
	t-ece	Topsoil Electrical Conductivity	/
	t-sand	Topsoil Sand Fraction	%
	t-clay	Topsoil Clay Fraction	%
	t-oc	Topsoil Organic Carbon	/
	t-silt	Topsoil Silt Fraction	%
	t-esp	Topsoil Sodicity (ESP-Exchangeable Sodium Percentage)	%
	t-gravel	Topsoil Gravel Content	%

Table S2. The performance of Maxent model using default settings and optimized settings by ENMeval

settings	regularization multiplier	feature combination	avg.test.AUC	avg.diff.AUC	avg.OR10	delta.AICc
default	1.5	LQH	0.8071	0.0802	0.2839	324.5774
optimized	3.5	LQ	0.8099	0.0436	0.1357	0

Table S3. The contribution and permutation importance of 16 environmental factors

Factors	Description	Percent	Permutation
		contribution (%)	importance (%)
bio6	Min Temperature of Coldest Month	66.02	65.06
elevation		28.73	25.04
bio11	Mean Temperature of Coldest Quarter	1.33	2.21
t-ph	Topsoil pH (H ₂ O)	0.75	1.25
bio12	Annual Precipitation	0.55	0.87
slope		0.49	0.13
bio14	Precipitation of Driest Month	0.46	1.40
bio2	Mean Diurnal Range	0.34	1.26
aspect		0.30	0.54
bio13	Precipitation of Wettest Month	0.22	0.26
t-bulk	Topsoil Bulk Density	0.21	0.27
t-clay	Topsoil Clay Fraction	0.20	0.33
bio15	Precipitation Seasonality (Coefficient of Variation)	0.18	0.46
bio10	Mean Temperature of Warmest Quarter	0.17	0.00
t-oc	Topsoil organic carbon	0.06	0.53
bio1	Annual Mean Temperature	0.00	0.36