# Supplementary Materials

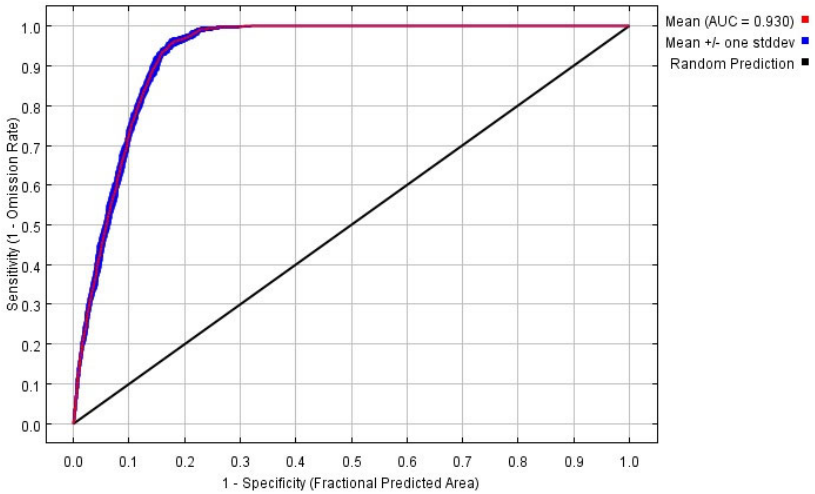



**Figure S1.** Receiver operating characteristic curve.

**Table S1.** 58 environment variables.

| Variable | | Description | Units |
|---|---|---|---|
| bioclimatic variables | bio1 | Annual mean temperature | ℃ |
| | bio2 | Mean diurnal range | ℃ |
| | bio3 | Isothermality | 1 |
| | bio4 | Temperature seasonality | - |

| | | | |
|---|---|---|---|
| | bio5 | Max temperature of warmest month | ℃ |
| | bio6 | Minimum temperature of the coldest month | ℃ |
| | bio7 | Temperature Annual Range | ℃ |
| | bio8 | Mean temperature of wettest quarter | ℃ |
| | bio9 | Mean temperature of driest quarter | ℃ |
| | bio10 | Mean temperature of warmest quarter | ℃ |
| | bio11 | Mean temperature of coldest quarter | ℃ |
| | bio12 | Annual precipitation | mm |
| | bio13 | Precipitation of wettest month | mm |
| | bio14 | Precipitation of the driest month | mm |
| | bio15 | Precipitation seasonality | - |
| | bio16 | Precipitation of wettest quarter | mm |
| | bio17 | Precipitation of driest quarter | mm |
| | bio18 | Precipitation of warmest quarter | mm |
| | bio19 | Precipitation of coldest quarter | mm |
| | t_usda_tex_class | Topsoil USDA texture classification | name |
| | s_cec_clay | Subsoil CEC (clay) | cmol/kg |
| | s_usda_tex_class | Subsoil USDA texture classification | name |
| | t_gravel | Topsoil Gravel Content | %vol. |
| | drainage | Drainage class | name |
| Soil variables | s_bs | Subsoil base saturation | % |
| | s_cec_soil | Subsoil CEC (soil) | cmol/kg |
| | s_gravel | Suboil Gravel Content | %vol. |
| | awc_class | Soil available water content | - |
| | s_bulk_den | S_bULK_DEN | - |
| | s_caco3 | Subsoil calcium carbonate | % wt. |

| | | |
|---|---|---|
| s_clay | Subsoil clay fraction | % wt. |
| s_ph_h2o | Subsoil pH（H2O） | -log（$H^+$） |
| t_bs | Topsoil base saturation | name |
| t_caco3 | Topsoil calcium carbonate | % wt. |
| t_cec_clay | Topsoil CEC (clay) | cmol/kg |
| t_sand | Topsoil sand fraction | % wt. |
| s_caso4 | Subsoil gypsum | % wt. |
| s_ece | Subsoil salinity (Elco) | dS/m |
| s_esp | Subsoil sodicity (ESP) | % |
| s_oc | Subsoil organic carbon | % wt. |
| s_ref_bulk_density | Subsoil reference bulk density | kg/dm3 |
| s_sand | Subsoil sand fraction | % wt. |
| s_silt | Subsoil silt fraction | % wt. |
| s_teb | Subsoil TEb | cmol/kg |
| t_caso4 | Topsoil gypsum | % wt. |
| t_cec_soil | Topsoil CEC (soil) | cmol/kg |
| t_clay | Topsoil clay fraction | % wt. |
| t_ece | Topsoil salinity (Elco) | dS/m |
| t_esp | Topsoil sodicity (ESP) | % |
| t_oc | Topsoil organic carbon | % wt. |
| t_ph_h2o | Topsoil pH（H2O） | -log（$H^+$） |
| t_ref_bulk_density | Topsoil reference bulk density | kg/dm3 |
| t_silt | Topsoil silt fraction | % wt. |
| t_teb | Topsoil TEb | cmol/kg |

| | | | |
|---|---|---|---|
| | t_texture | Topsoil texture | name |
| Topographic variables | elevation | Elevation | m |
| | slope | Slope | ° |
| | aspect | Aspect | ° |