

Supplementary Material Uncertainty of partial dependence

relationship between climate and vegetation growth calculated by machine learning models

Boyi Liang¹, Hongyan Liu^{2,*}, Elizabeth L. Cressey³, Chongyang Xu⁴, Liang Shi^{5,6}, Lu Wang²,
Jingyu Dai², Zong Wang¹, Jia Wang¹

¹ College of Forestry, Precision Forestry Key Laboratory of Beijing, Beijing Forestry University, Beijing 100083, China

² MOE Laboratory for Earth Surface Processes, College of Urban and Environmental Sciences,, Peking University, Beijing, 100871, China

³ Geography, Faculty of Environment Science and Economy, University of Exeter, Exeter, EX4 4RJ, UK

⁴ Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem, Rehovot, 7610001, Israel

⁵ Key Laboratory of Ecosystem Network Observation and Modeling, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, 100101, China

⁶ National Ecosystem Science Data Center, Beijing, 100101, China

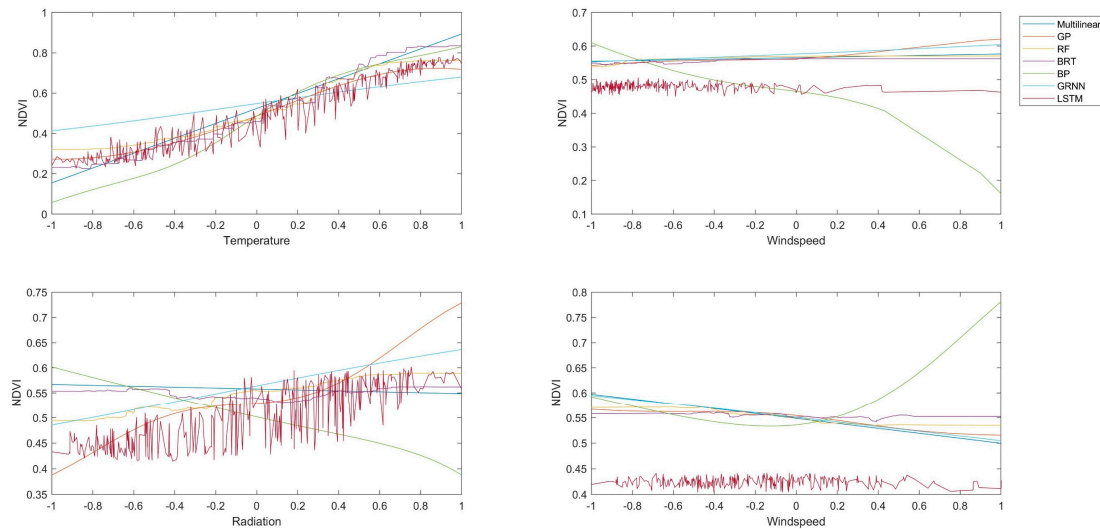


Figure S1. Partial dependence plots of climate factors and NDVI calculated by different statistical models

Table S1. Total number of change point for each partial dependence plot

	Temperature	Rainfall	Radiation	Windspeed	Average number of change point
Multi-linear	0	0	0	0	0
GP	2	4	0	10	4
RF	67	97	97	85	87
BRT	67	44	68	62	60
BP	0	0	0	1	0

GRNN	0	0	0	0	0
LSTM	243	251	238	226	240

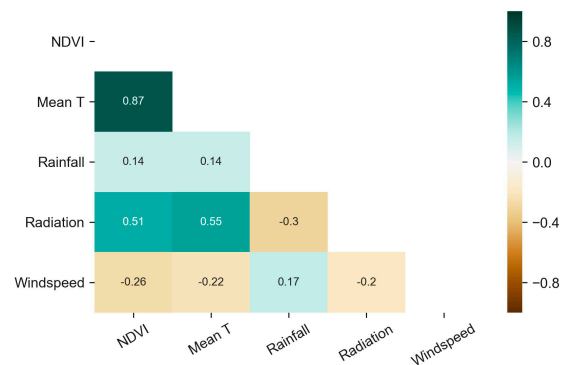


Figure S2. Cross correlation coefficient for each pair of climate factors and NDVI (T is mean air temperature)

Table S2. Mean determination coefficient of each statistical model

Model	Multilinear	BP	GP	RF	LSTM	BRT	GRNN
R²	0.802	0.802	0.851	0.926	0.977	0.980	0.997