

Article

A stacking ensemble learning model for monthly rainfall prediction in the Taihu Basin, China

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Supplementary Figures

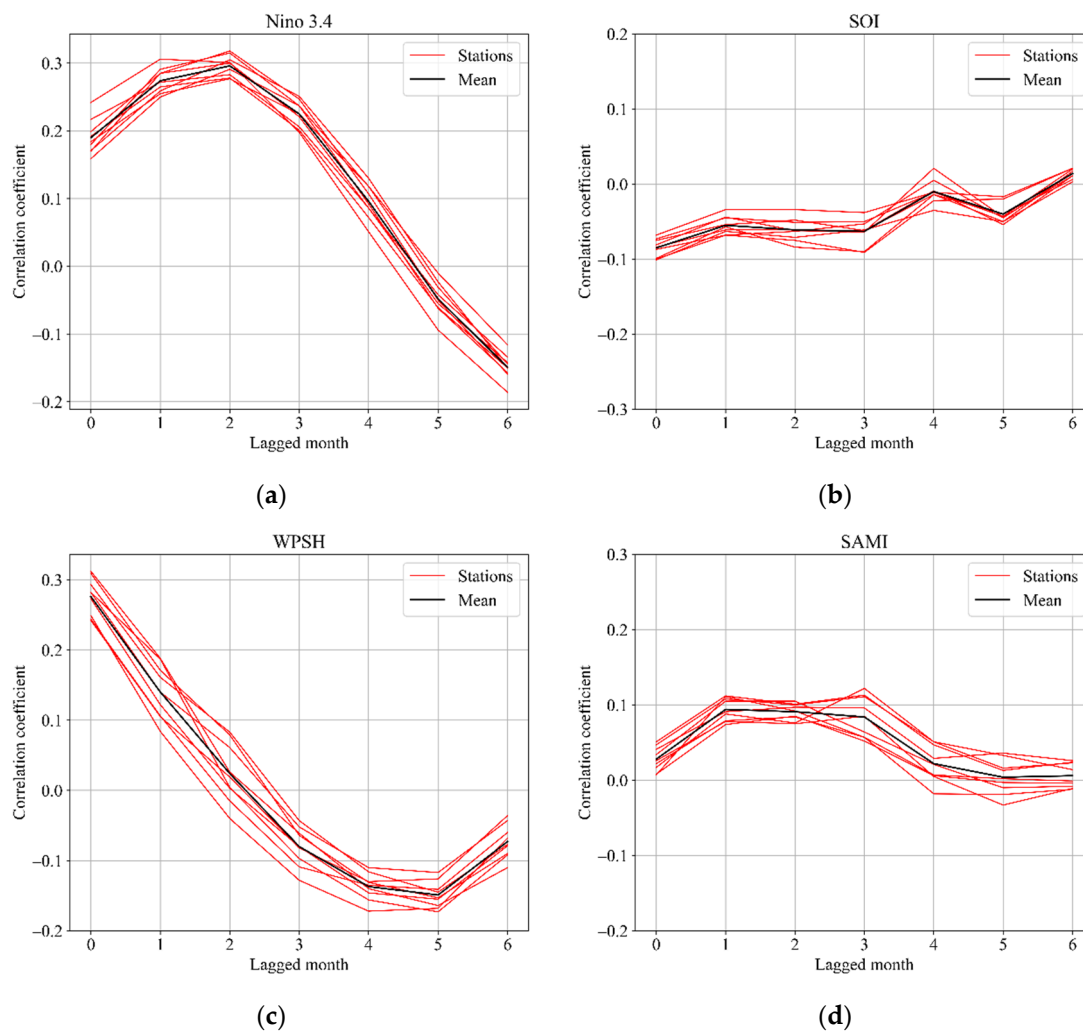
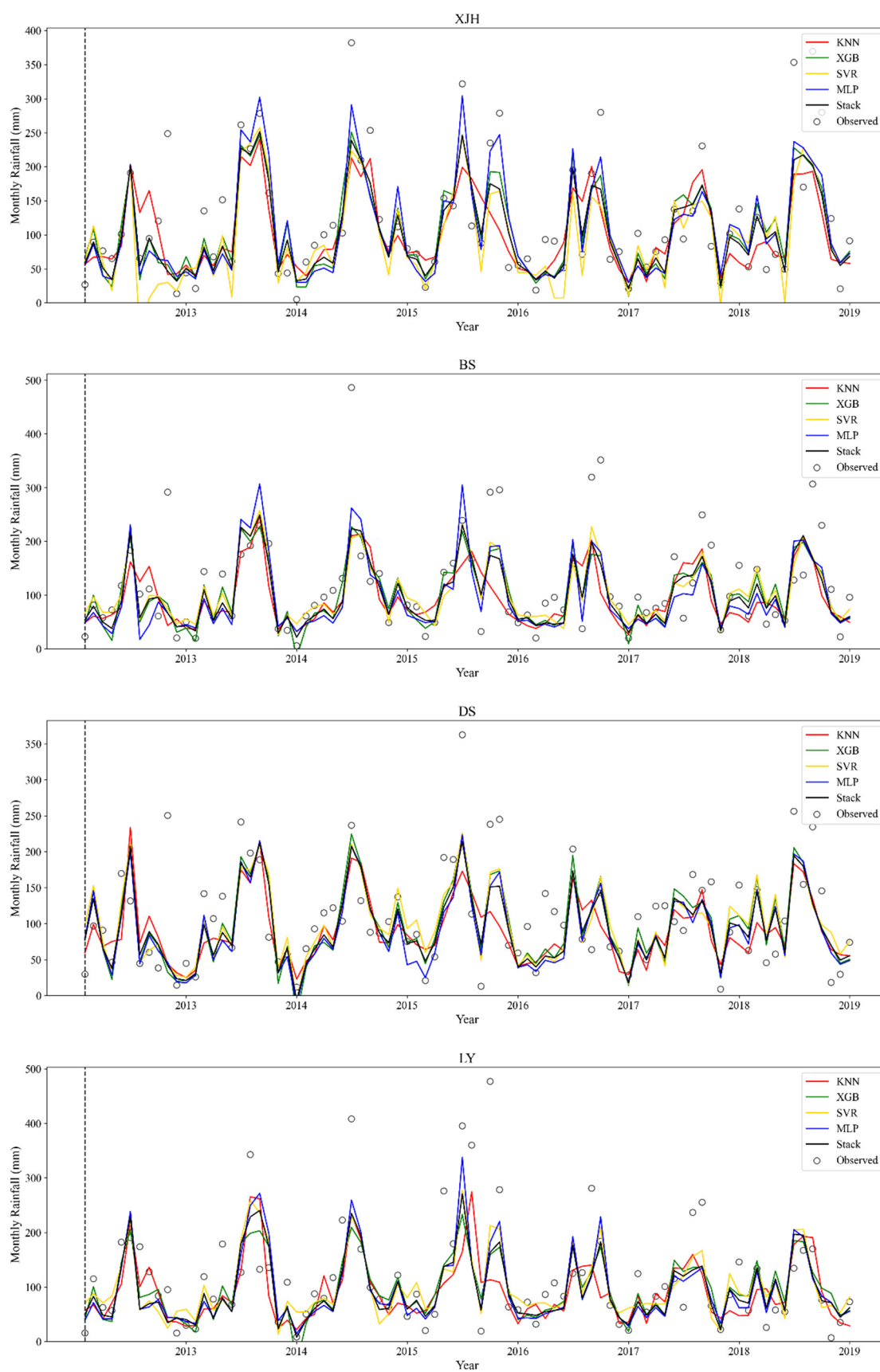
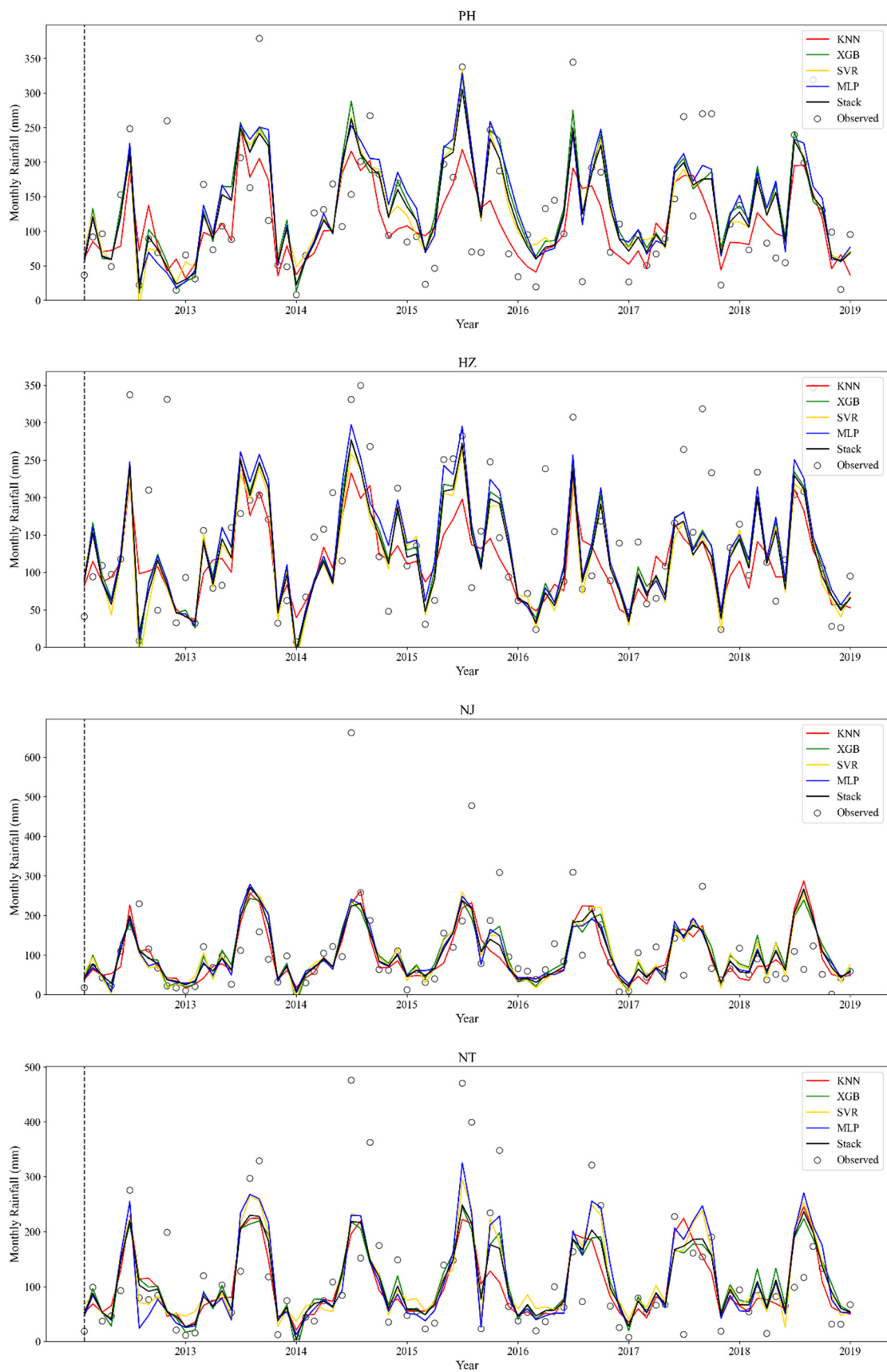


Figure S1. The correlation between lagged climate indices and rainfall at the 9 stations in the Taihu basin. Climate indices are: (a) Nino 3.4; (b) SOI; (c) WPSH; (d) SAMI.





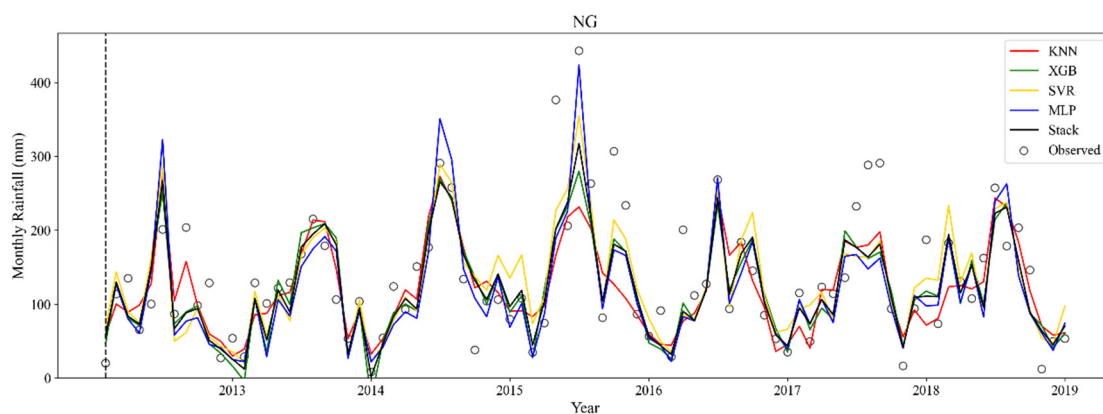
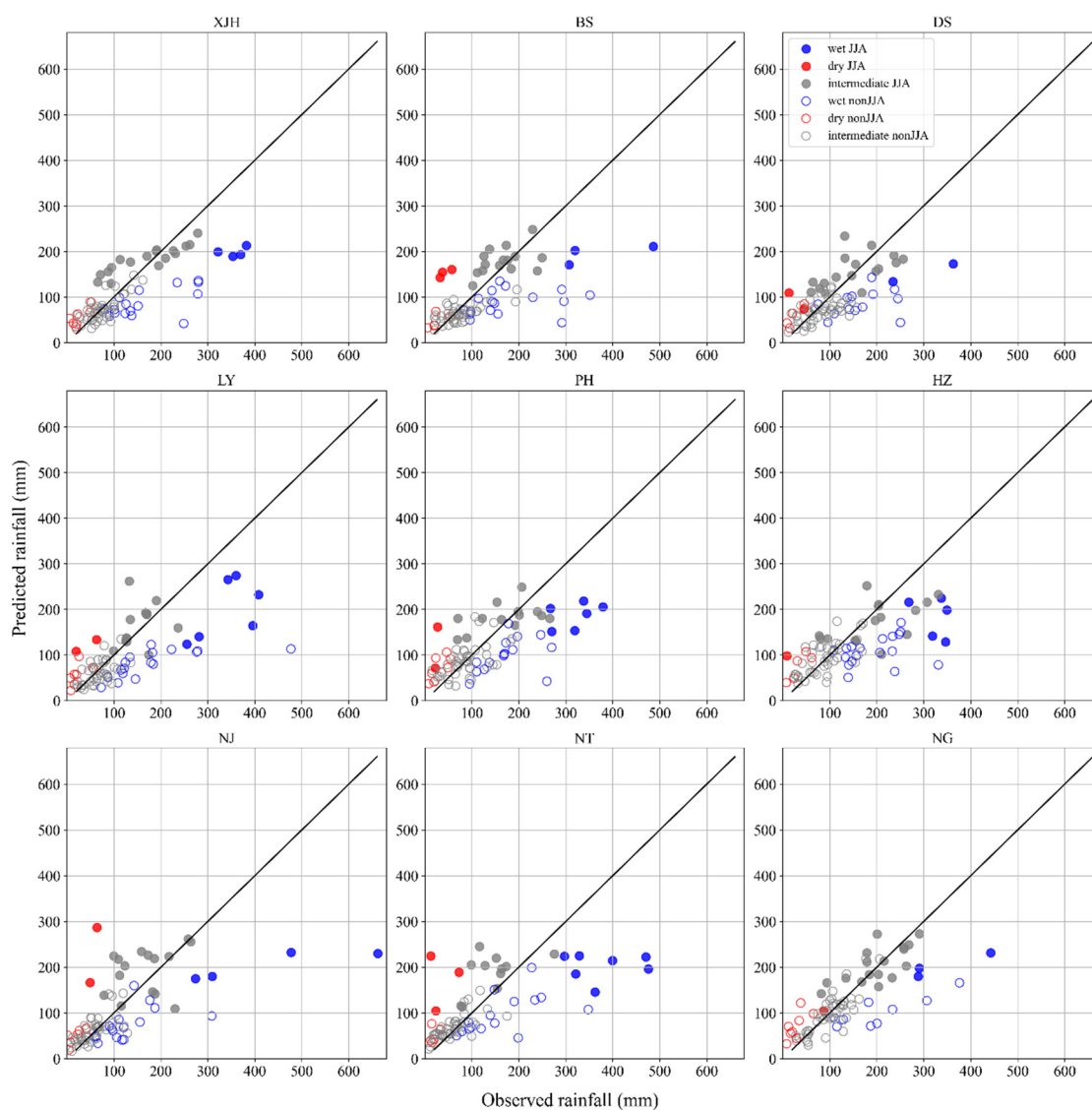
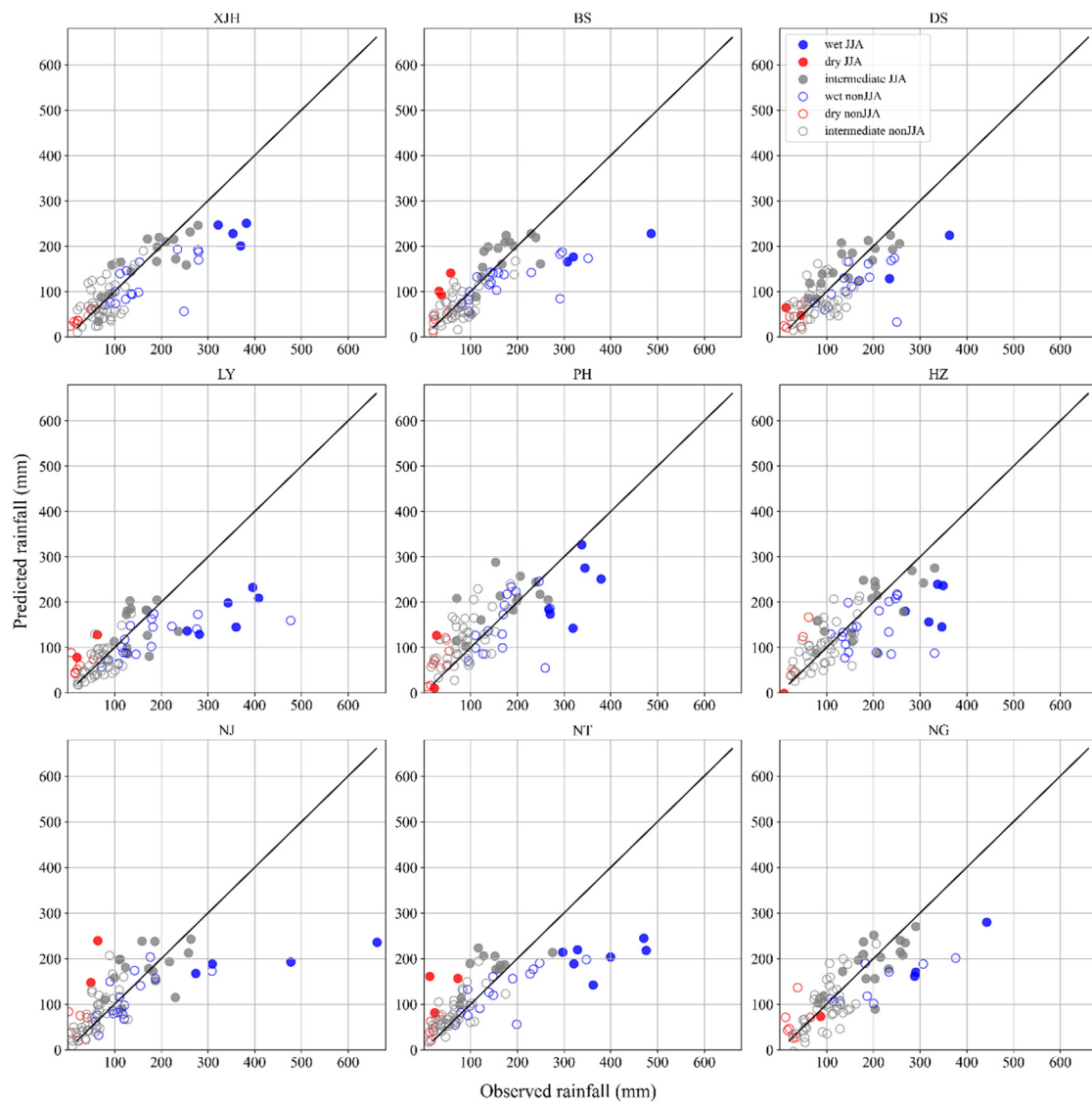


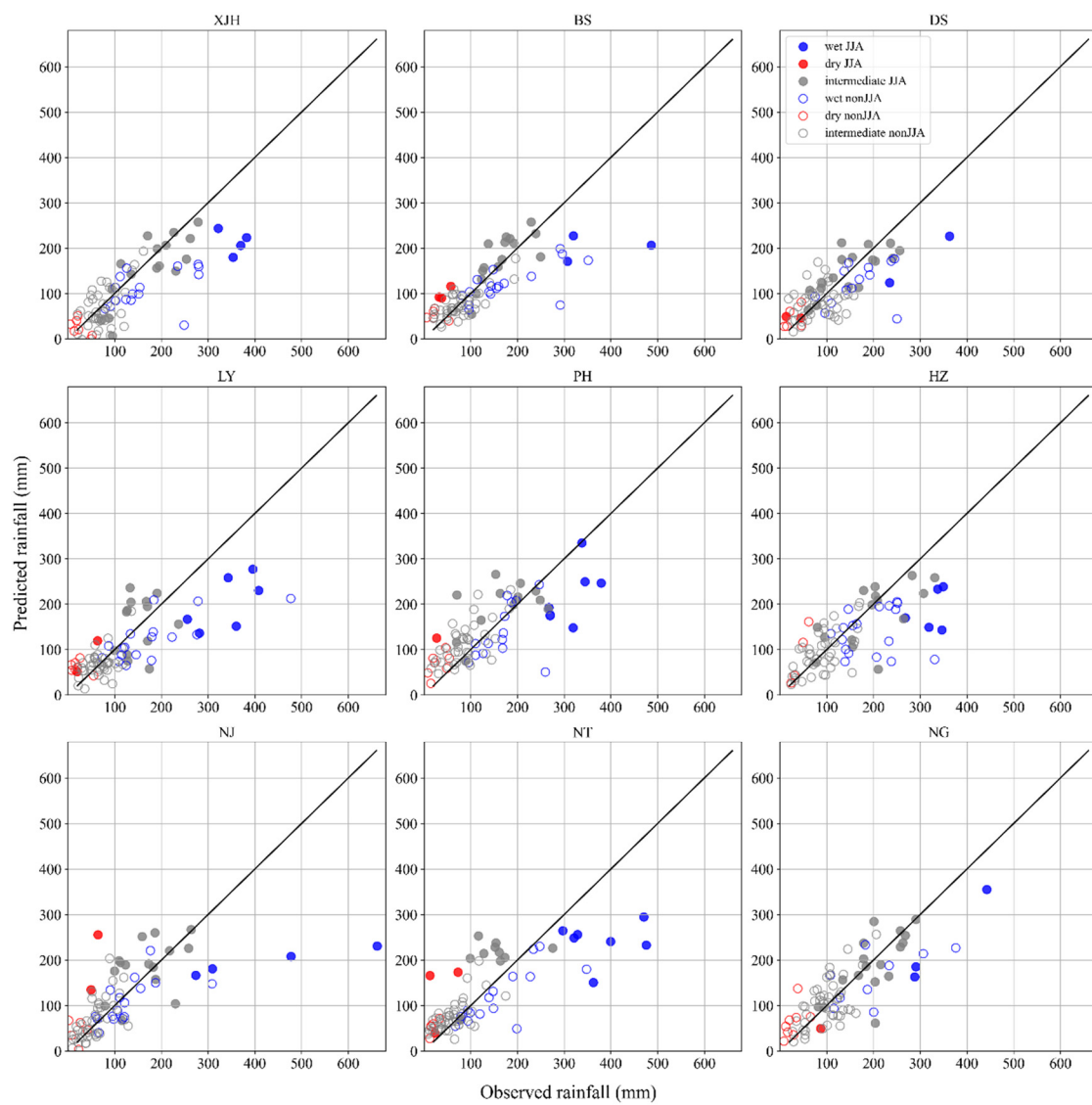
Figure S2. Prediction results of monthly rainfall at the nine stations in the Taihu basin.



(a)



(b)



(c)

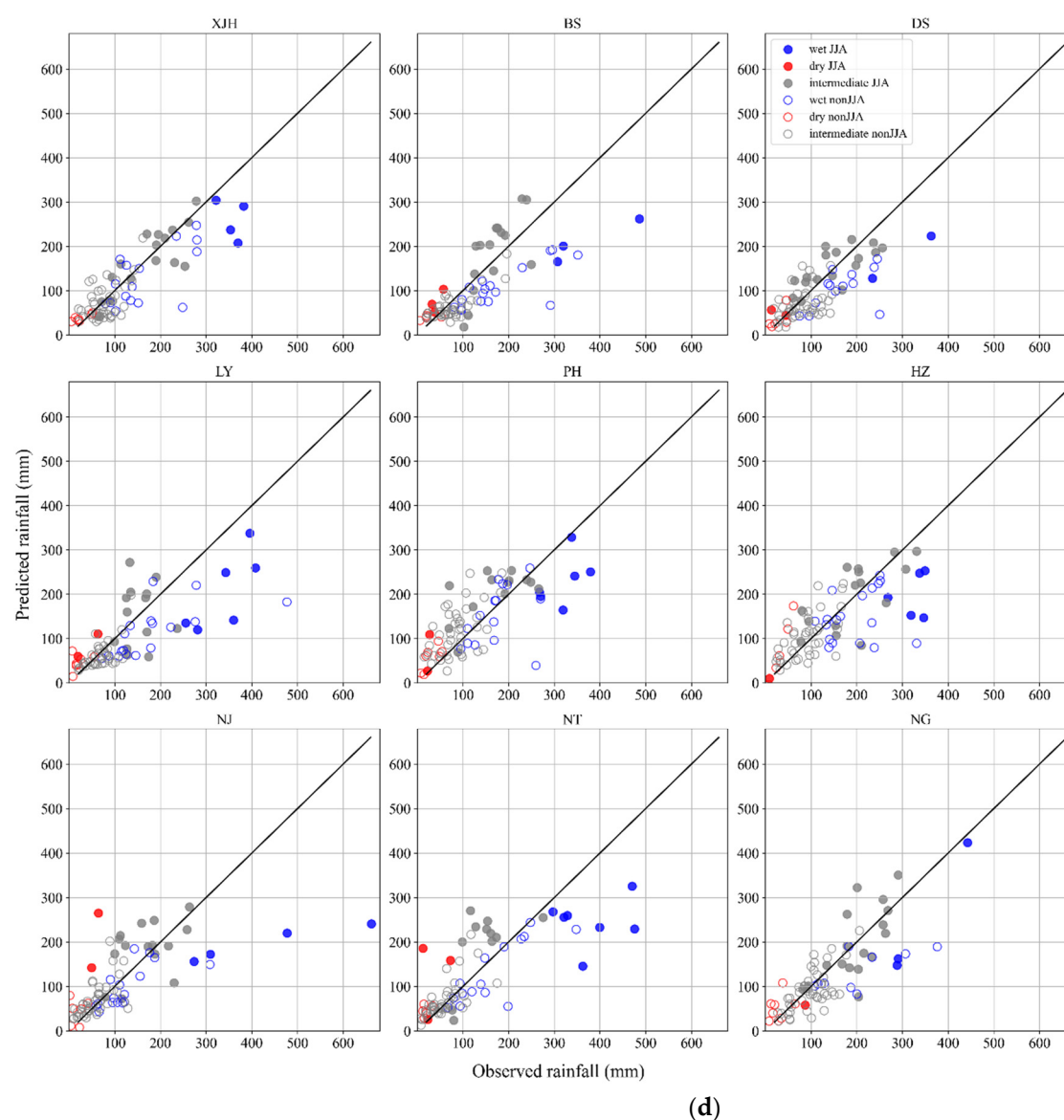


Figure S3. Scatter plot showing the association between observed and predicted rainfall of the base models for the testing period (2013-2019): (a) k-NN model; (b) XGB model; (c) SVR model; (d) ANN model.

Table S1. The best model selected in terms of R^2 , RMSE and MAE at the nine stations.

	XJH	BS	DS	LY	PH	HZ	NJ	NT	NG
R^2	ANN	SVR	XGB	SVR	Stack	XGB	XGB	ANN	Stack
RMSE	ANN	SVR	XGB	SVR	Stack	XGB	XGB	ANN	Stack
MAE	ANN	SVR	XGB	Stack	Stack	Stack	Stack	ANN	KNN

Table S2. The coefficient of variation deviation (C_v) of the observed and the predicted monthly rainfall series at the nine stations.

	XJH	BS	DS	LY	PH	HZ	NJ	NT	NG
Observation (1961-2012)	0.820	0.837	0.781	0.809	0.800	0.723	0.944	0.890	0.737
Observation (2013-2019)	0.722	0.739	0.612	0.824	0.654	0.604	0.960	0.935	0.635
KNN	0.543	0.553	0.471	0.621	0.456	0.430	0.688	0.599	0.488
XGB	0.591	0.563	0.543	0.552	0.454	0.494	0.594	0.552	0.539
SVR	0.647	0.529	0.497	0.577	0.447	0.513	0.641	0.620	0.520

ANN	0.664	0.677	0.571	0.680	0.458	0.507	0.633	0.691	0.627
Stack	0.587	0.569	0.512	0.605	0.448	0.509	0.623	0.570	0.523
