**Table A1.** Abbreviations

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| **Abbreviation**  | **Description**  |
| ANN | Artificial neural network |
| ARIMA | Autoregressive integrated moving average model |
| BLSTM | Bidirectional long short-term memory |
| CC | Correlation coefficient |
| CNN | Convolutional neural network |
| COE | Coefficient of efficiency |
| CORR | Correlation coefficient  |
| CSI | Critical success index |
| DBM | Deep belief network |
| DFFNet | Dual-branch feature fusion model  |
| DNN | Deep neural networks  |
| DWT | Discrete wavelet transform |
| FAR | False alarm rate  |
| GIS | Geographic information system  |
| GPM | Global precipitation measurement  |
| GRU | Gated recurrent unit  |
| GWR | Geographically weighted regression |
| HSS | Heidke skill score  |
| IA | Index of agreement |
| IMERG | Integrated multi satellite retrievals |
| KGE | Kling–Gupta efficiency  |
| KNN | K-nearest neighbors |
| LI | Linear interpolation  |
| LMI | Legates–McCabe index  |
| LR | Linear regression  |
| LSTM | Long short-term memory  |
| MAE | Mean absolute error  |
| MAPE | Mean absolute percentage error  |
| MAPLE | McGill algorithm for precipitation nowcasting by Lagrangian extrapolation  |
| MARS | Multivariate adaptive regression splines  |
| MBE | Mean bias error |
| ML | Machine learning  |
| MLP | Multilayer perceptron  |
| MLR | Multiple linear regression  |
| NB | Naive Bayes |
| NE | Normalized error |
| NPV | Negative predictive value  |
| NSE | Nash-Sutcliffe efficiency |
| NSEC | Nash-Sutcliffe efficiency coefficient  |
| OI | Overall index  |
| PCA | Principal component analysis  |
| PCC | Pearson correlation coefficient |
| PEMR | Percent error in maximum rainfall  |
| POD | Probability of detection  |
| PPMCC | Pearson product-moment correlation coefficients  |
| PSO | Particle swarm optimization  |
| RAE | Relative absolute error |
| RBF | Relative forecast bias |
| RF | Random forest |
| RFB | Relative forecast bias |
| RIAA | Agroclimatic Information network of Andalusia |
| RIPPER | Repeated incremental pruning to produce error reduction |
| rMAE | Relative MAE |
| RMSE | Residual mean square error |
| RNN | Recurrent neural network |
| rRMSE | Relative RMSE |
| RSR | RMSE-observations standard deviation ratio |
| RT | Random tree |
| RVMs | Relevant vector machines |
| SIG | Significance value |
| SSIM | Structural similarity index measure |
| SVC | Support vector classification |
| SVM | Support vector machine |
| SVR | Support vector regression  |
| TabNet | Tabular learning neural network |
| TDR | True detection rate |
| TRT | Temporal random tree |
| TS | Threat score |
| WPD-ELM | Wavelet packet decomposition-extreme learning machine |
| WRIS | Water resources information system |
| XGBoost | Extreme gradient boosting |