

S5 Table. RMSE of our proposed approach against the other model set-ups from the ensemble mean mean \pm sd estimate of the 50 runs. *LSTM* = LSTM model using the full depth of the Landsat time series and climate data; *LSTM_{perm}* = *LSTM* model but the temporal patterns of both the predictive and the target variables were randomly permuted while instantaneous relationships between predictive and target variables were kept; *LSTM_{m_{sc}}* = *LSTM* model but the Landsat time series for each band were replaced by their mean seasonal cycle, while using the actual values of air temperature (T_{air}), precipitation (P), global radiation (Rg), and vapor pressure deficit (VPD); *LSTM_{annual}* = *LSTM* model but the Landsat time series for each band were replaced by their annual mean, while using the actual values of T_{air} , P, Rg, and VPD, RF = Random Forest model using the actual values of the Landsat time series and climate data.

	Seasonal	Seasonal anomaly	Across-site	Interannual anomaly
LSTM	1.12 \pm 0.02	0.61 \pm 0.005	0.63 \pm 0.02	0.31 \pm 0.004
LSTM _{m_{sc}}	1.15 \pm 0.01	0.61 \pm 0.003	0.65 \pm 0.02	0.32 \pm 0.002
LSTM _{annual}	1.23 \pm 0.03	0.61 \pm 0.008	0.66 \pm 0.02	0.32 \pm 0.008
LSTM _{perm}	1.19 \pm 0.02	0.63 \pm 0.005	0.65 \pm 0.03	0.31 \pm 0.004
RF	1.25 \pm 0.00006	0.72 \pm 0.0002	0.65 \pm 0.0001	0.33 \pm 0.0001