

Appendix

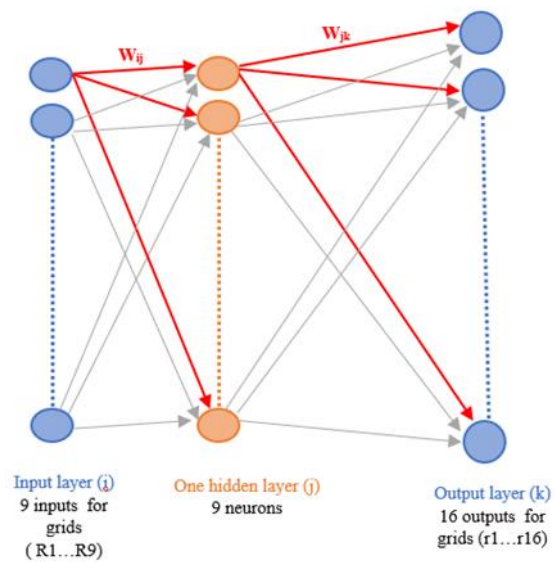


Figure. S1 ANN architecture

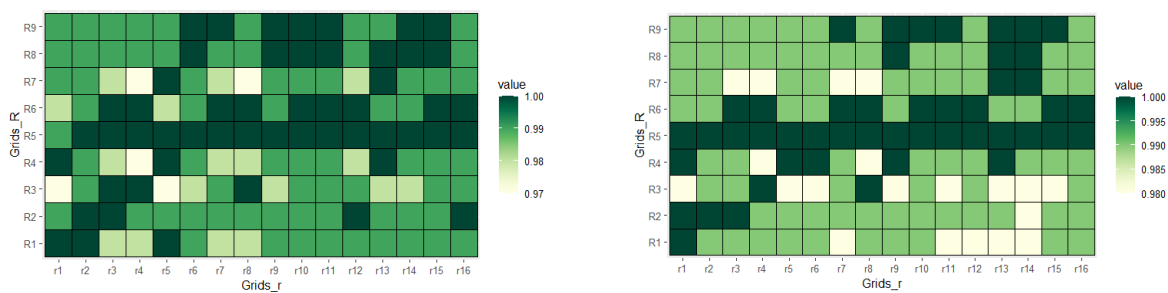


Figure. S2 Spatial correlation of the 16 central grids r1 to r16 (5-km) with its own and surrounded grids R1 to R9 (20-km), October (left) and June (right) month, region2.

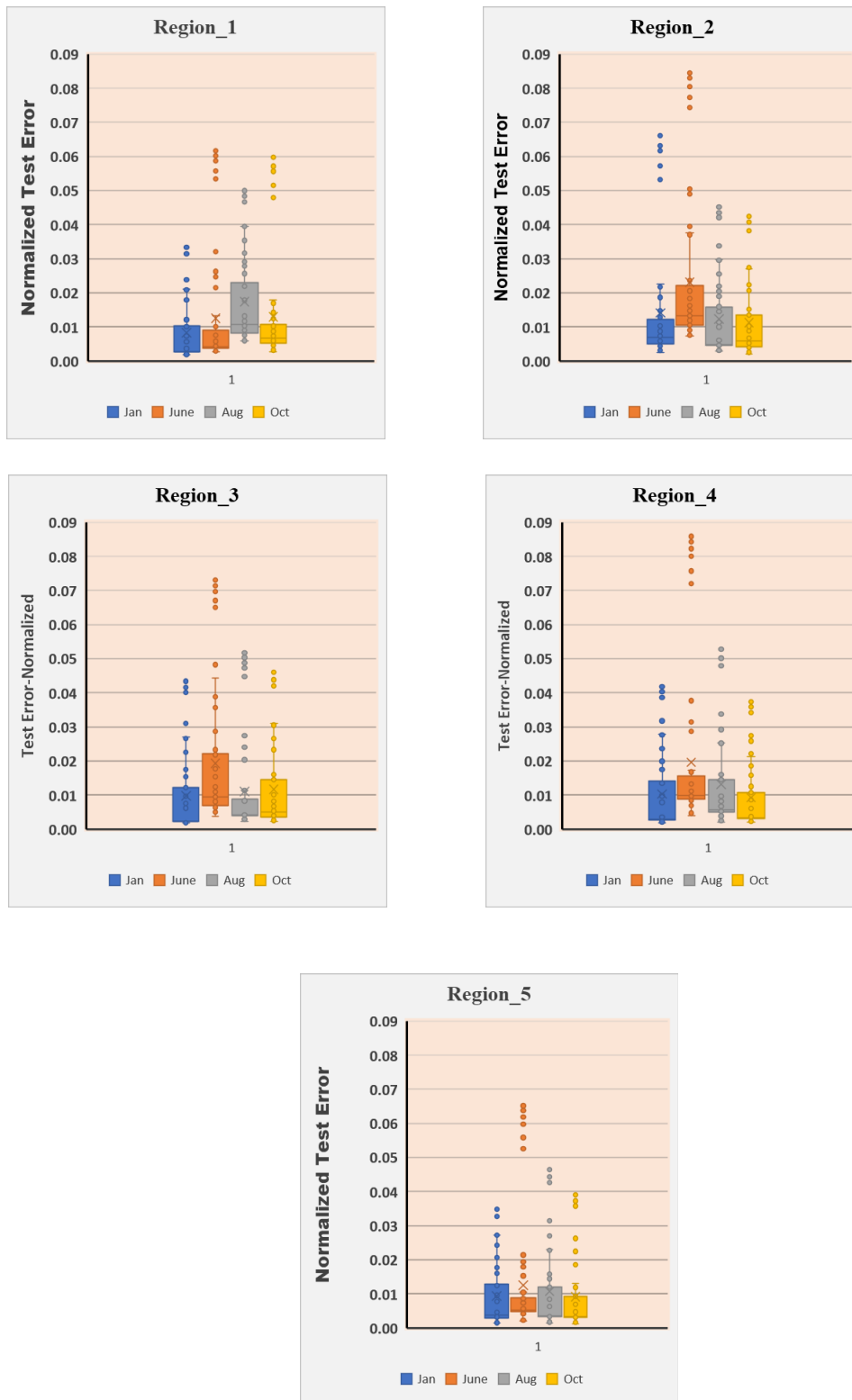


Figure. S3 Boxplot of the normalized test error for each case of combination (81 cases) for each season in all regions

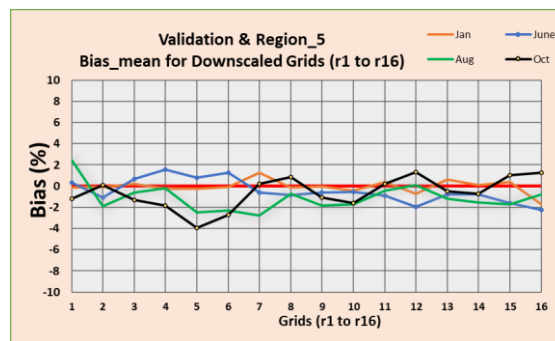
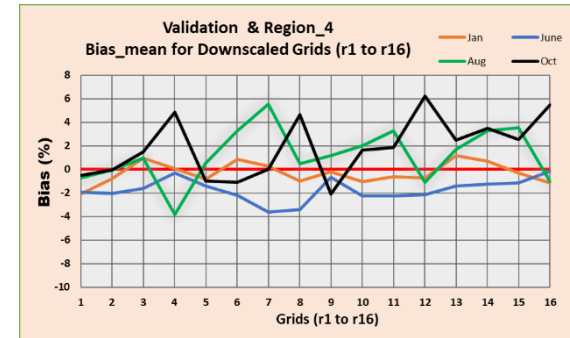
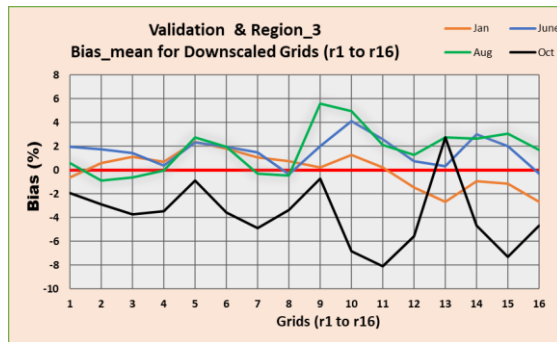
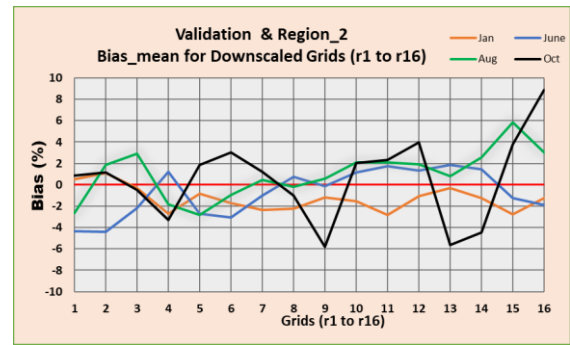
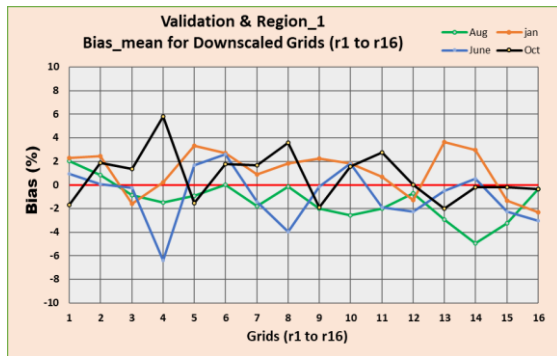


Figure. S4 Plots of Bias in mean for 5 km grids from (r1 to r16) during all seasons in all regions 1, 2,3,4 and 5 in validation stage

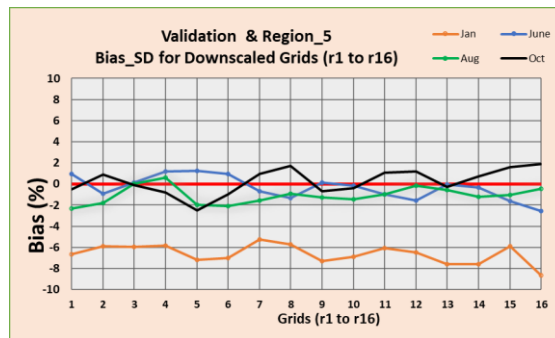
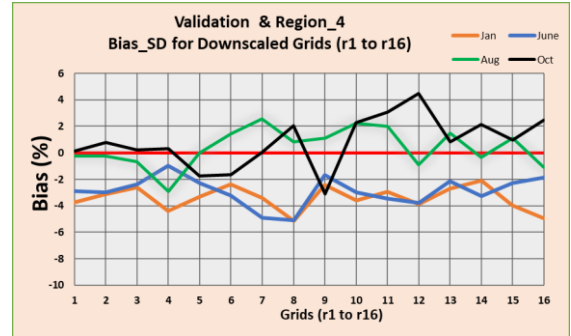
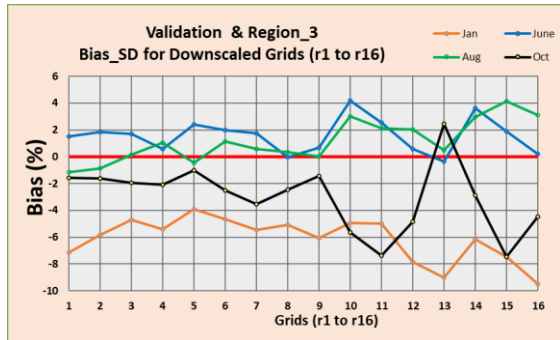
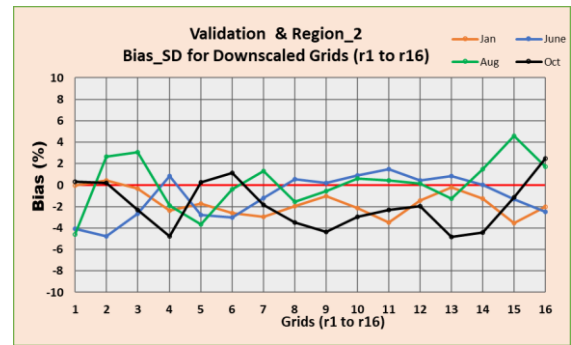
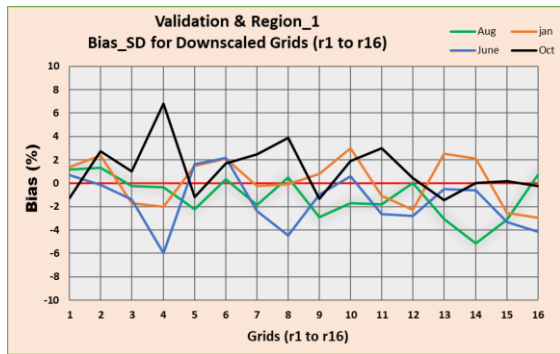


Figure. S5 Plots of Bias in standard deviation for 5 km grids from (r1 to r16) during all seasons in all regions 1, 2, 3, 4 and 5 in validation stage

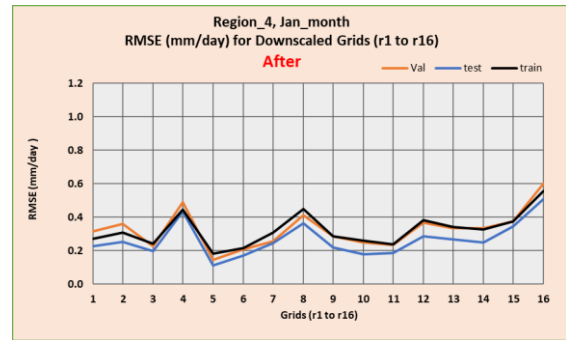
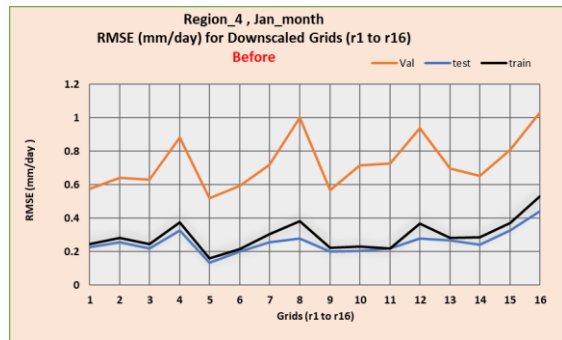
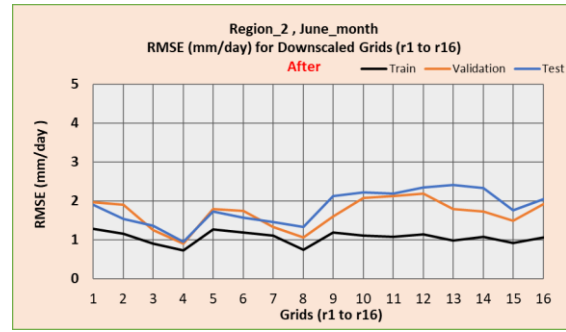
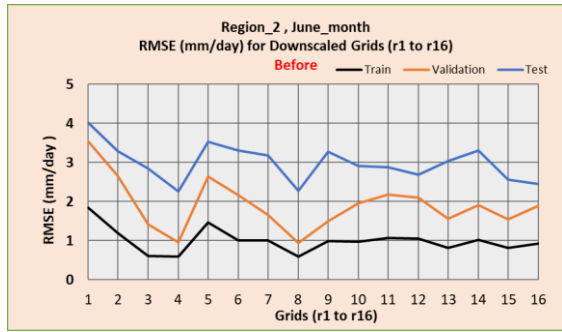
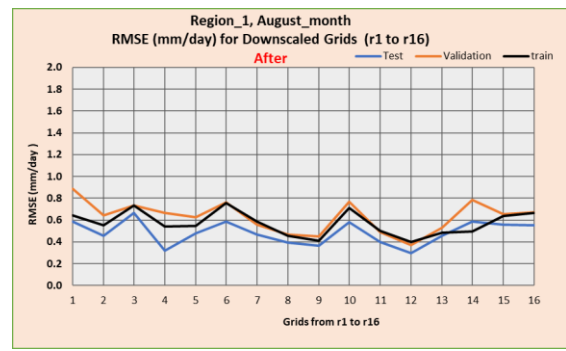
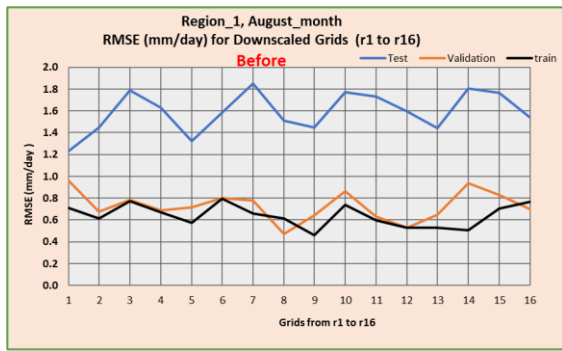


Figure. S6 RMSE of train, test and validation stages for August regions 1, June region 2 and January region 4, before (left) and after (right) including Pmax in training stage

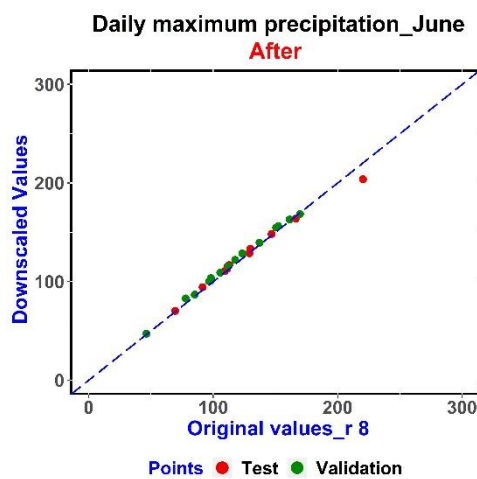
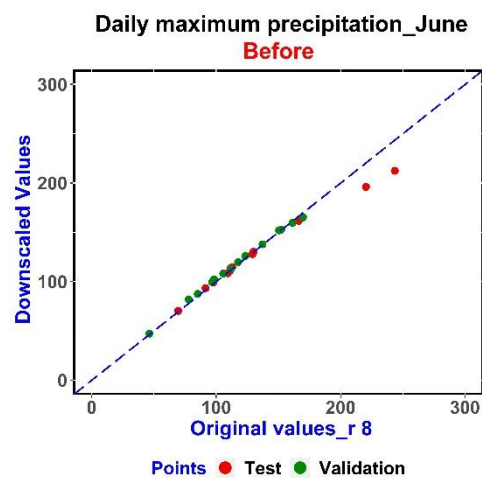


Figure. S7 Scatter plot of downscaled and observed maximum daily 5km precipitation for test (red) and validation (blue) stages for **June** month before (left) and after (right) including Pmax in training stage, region 2