Supporting Information for "Changes in mean evapotranspiration dominate groundwater recharge in semi-arid regions"

Contents of this file

1. Figures S1 to S6
2. A separate Excel file including the details of the locations considered in our study.

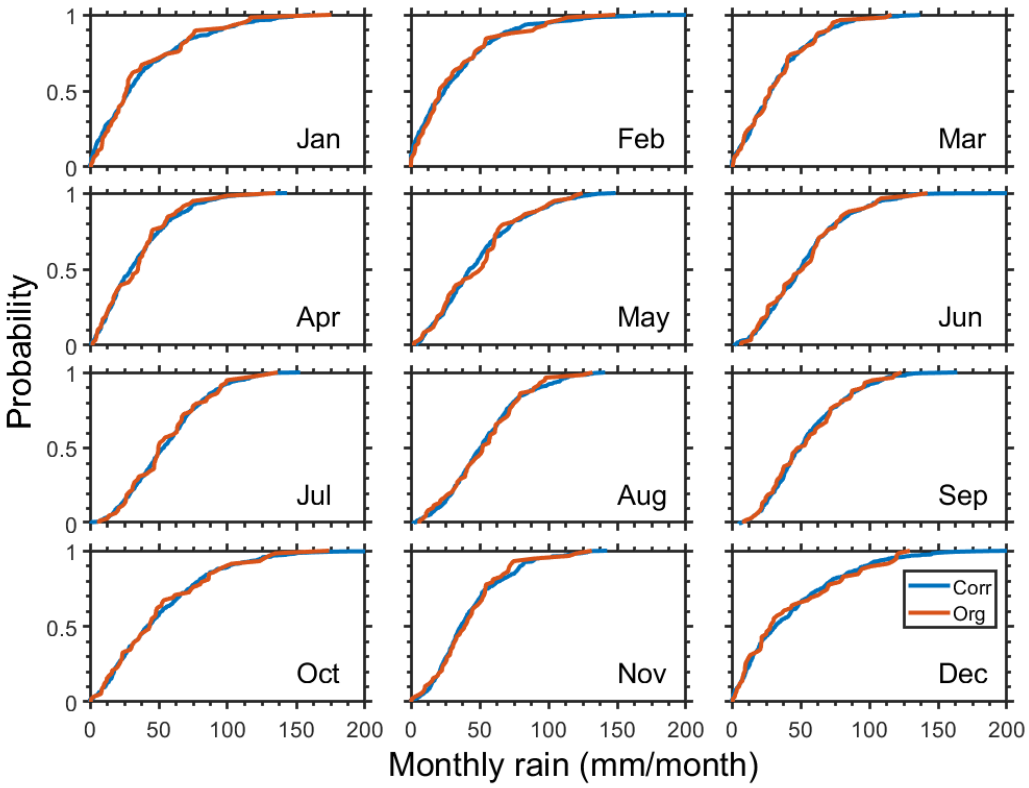

Figure S1: The effect of the monthly mean and STD correction on the monthly rain cumulative distribution function. See the Methods section of the main paper. For this demonstration, we used the rain data for a specific location ([-36.4469, 145.711]; Crosbie et al. (2010)).

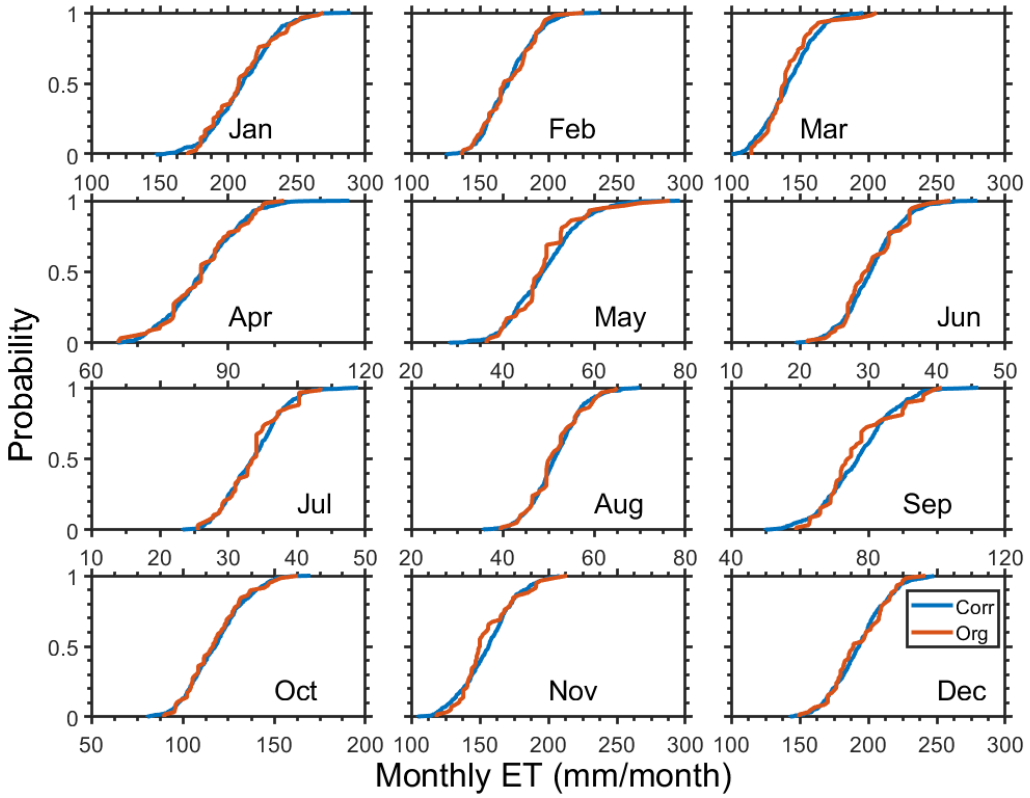

Figure S2: The effect of the monthly mean and STD correction on the monthly cumulative ETref distribution function. See the Methods section of the main paper. For this demonstration, we used the ETref data for a specific location ([-36.4469, 145.711]; Crosbie et al. (2010)).

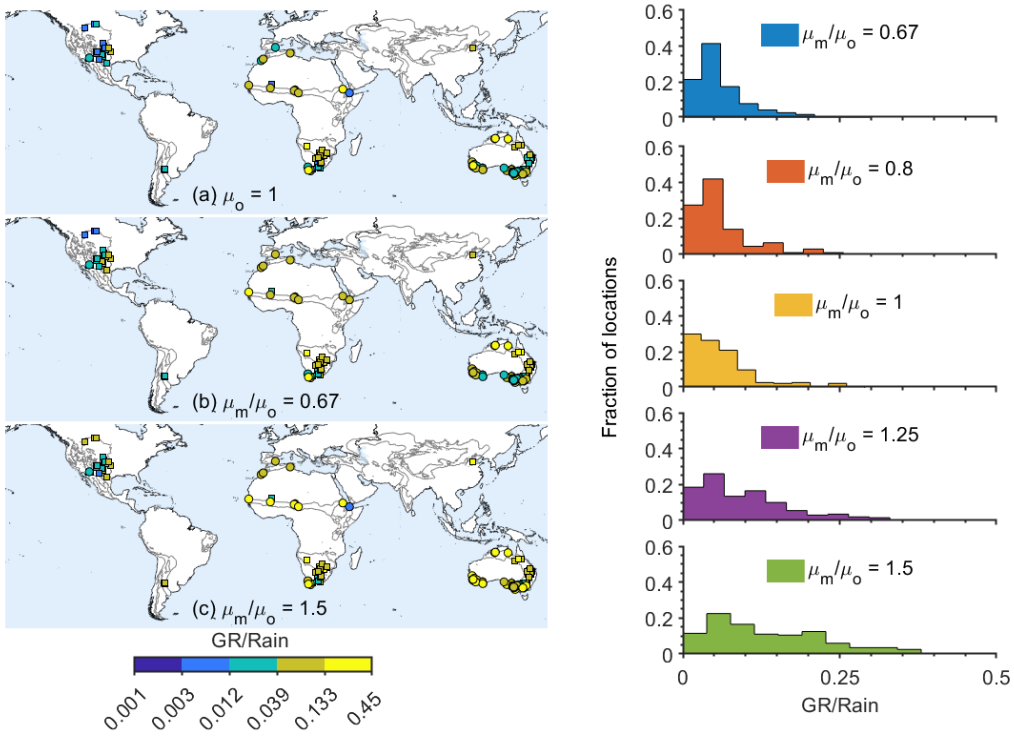

Figure S3: The effect of rain yearly mean modification on the GR/Rain ratio. The left panels depict the modified ratio in different locations. The right panels depict the histograms of the fraction of locations with different GR/Rain ratios under different mean rain modifications.

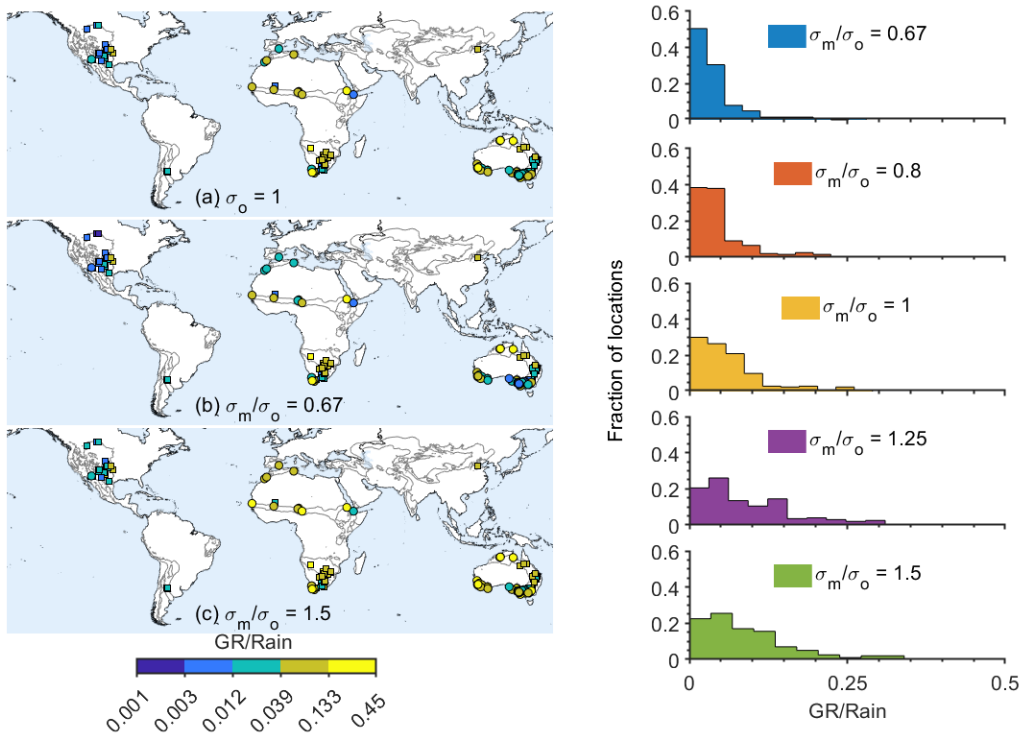

Figure S4: The effect of ETref yearly STD modifications on the GR/Rain ratio. The left panels depict the modified ratio in different locations. The right panels depict the histograms of the fraction of locations with different GR/Rain ratios under different mean rain modifications.

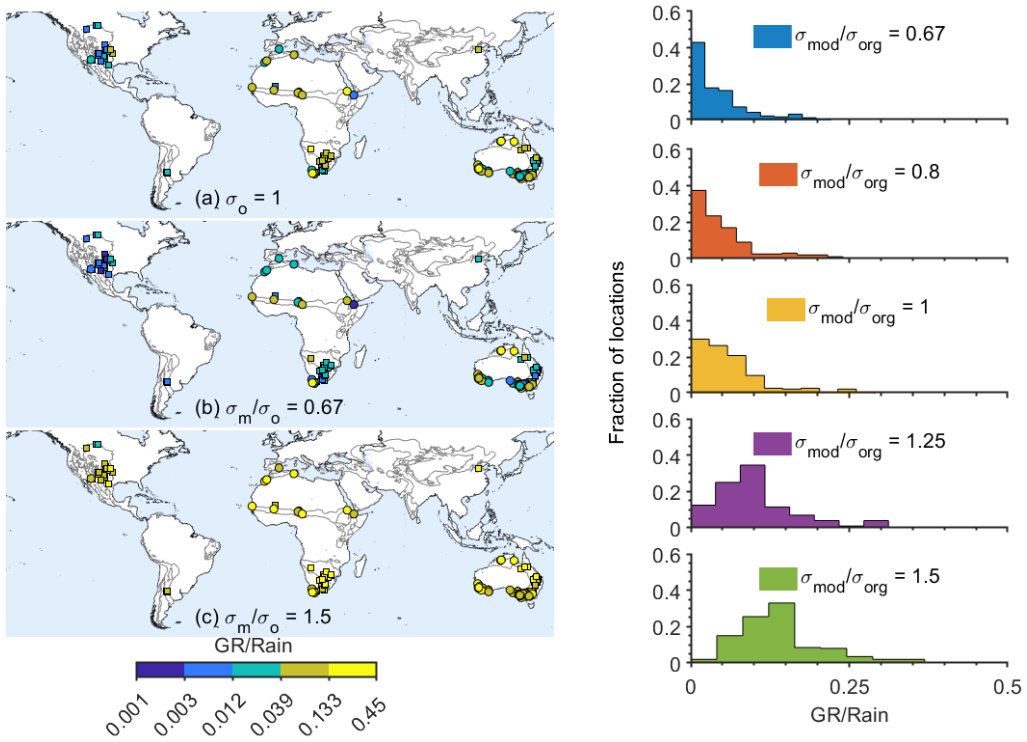

Figure S5: The effect of rain yearly STD modifications on the GR/Rain ratio. The left panels depict the modified ratio in different locations. The right panels depict the histograms of the fraction of locations with different GR/Rain ratios under different rain STD modifications.

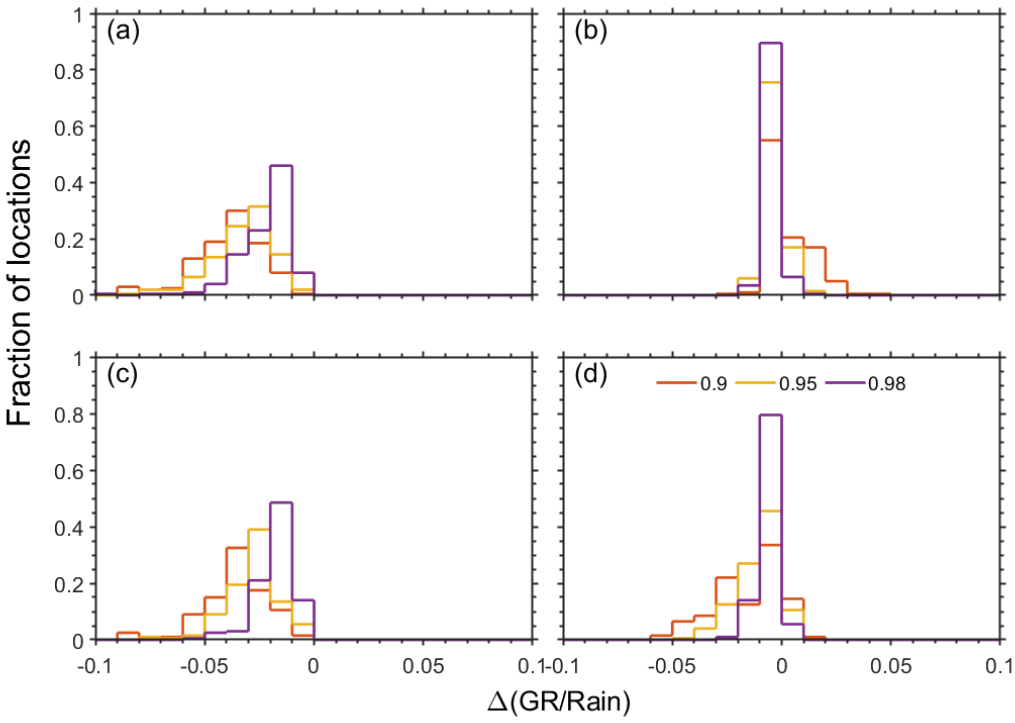

Figure S6: Histograms of the change in the GR/Rain ratio for doubling the extreme events above the 90%, 95%, and 98% quantiles. Panel (a) represents the responses to doubling the extreme rain events regardless of the season and panel (c) the response to doubling the extreme rain events for each calendar month separately. For both cases, it is apparent that doubling the extreme rain events results in a higher GR/Rain ratio in all locations. Panel (b) represents the responses to doubling the extreme ETref events regardless of the season and panel (d) the response to doubling the extreme ETref events for each calendar month separately. It is apparent that the doubling of extreme ETref events has a weaker effect. In most locations, it leads to an increase in the GR/Rain and, in a small fraction of the locations, to a decrease in the GR/Rain ratio.

References

Crosbie, R. S., Jolly, I. D., Leaney, F. W., and Petheram, C.: Can the dataset of field based recharge estimates in Australia be used to predict recharge in data-poor areas?, Hydrology and Earth System Sciences, 14, 2023–2038, https://doi.org/10.5194/hess-14-2023-2010, 2010.