Supporting Information for "Does extreme precipitation intensity depend on the emissions scenario?"

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Introduction This supporting information provides a description and visualization of the statistical test used in the main article.

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Text S1. To statistically test whether precipitation changes between scenarios, we compare the sign of the change in precipitation for each model in pairs of scenarios and evaluate its statistical significance using the Signs test. Figure S1 visualizes these comparisons. For each model, if the lower scenario has a higher change in precipitation, the box is black. We sum the number of pairs where precipitation decreases across scenario across all models and scenario pairs, and then use the Signs test [e.g., *Mendenhall*, 1987] (and the normal approximation to the binomial distribution) with the null hypothesis that the changes in precipitation are from the same distribution. For the 48 comparisons we make for each of the four precipitation variables (shown in Fig. 2 and 4), the distributions are different at the 95% confidence level if less than 18 or more than 30 of the comparisons have the same direction.

References

Mendenhall, W. (1987), *Introduction to Probability and Statistics*, 7th ed., 783 pp., Duxbury Press, Boston, MA.

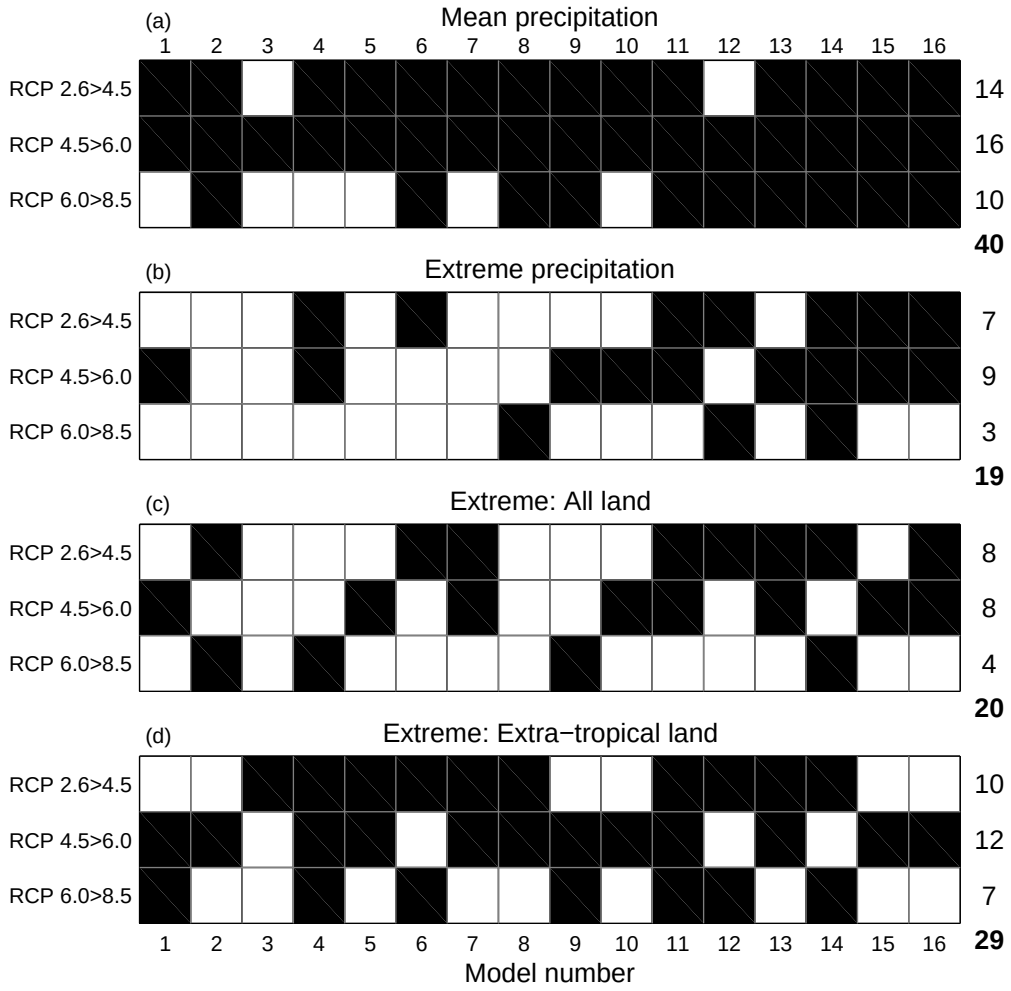

Figure S1. Comparison of the sign of change of precipitation between pairs of RCP scenarios for each model. (a) Global-mean precipitation, (b) global extreme precipitation, (c) extreme precipitation over all land, and (d) extreme precipitation over extra-tropical land. Model numbers correspond to Table 1. Black boxes indicate the higher emissions scenario has a smaller change in precipitation (following our expectation for global-mean precipitation change). At right of each row is the number of black boxes in the row; at the bottom right of each panel is total sum of black boxes in the panel.