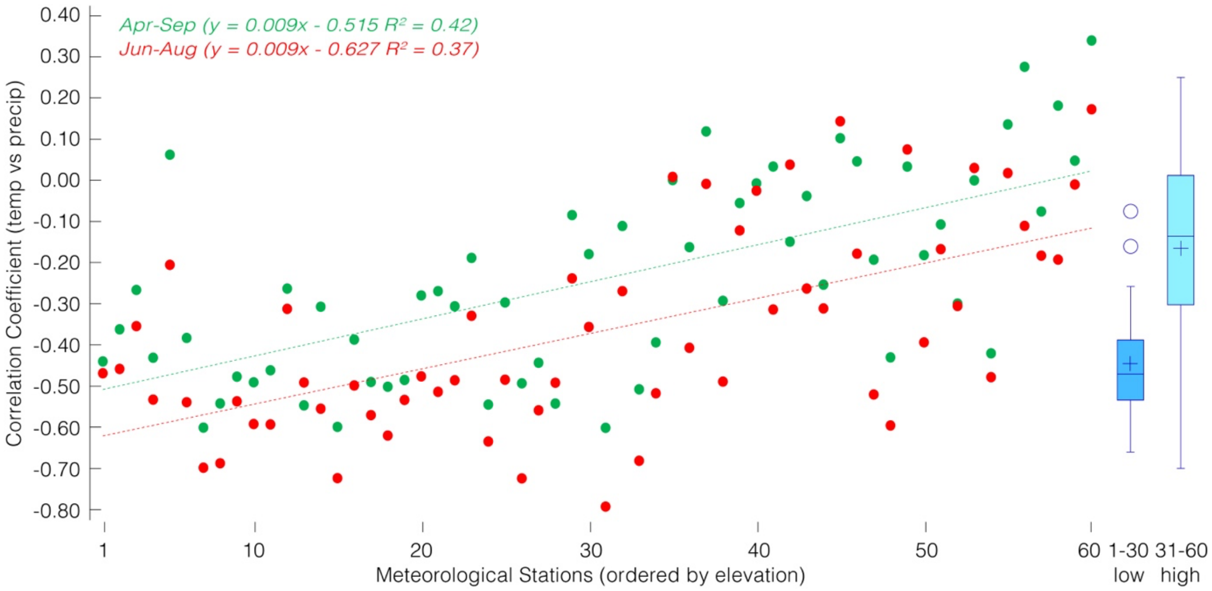
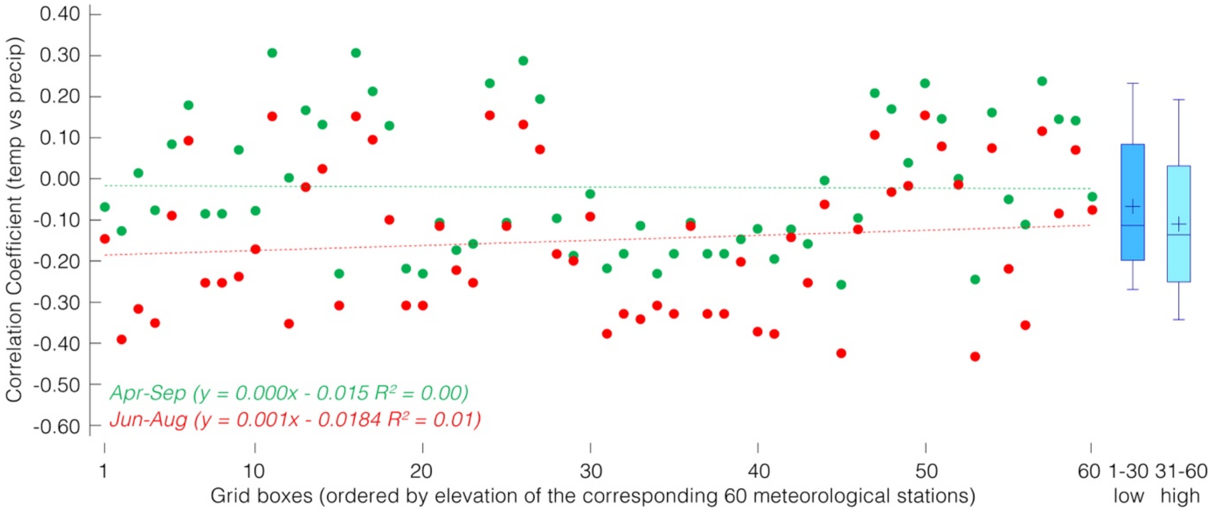
Online Supplementary Material

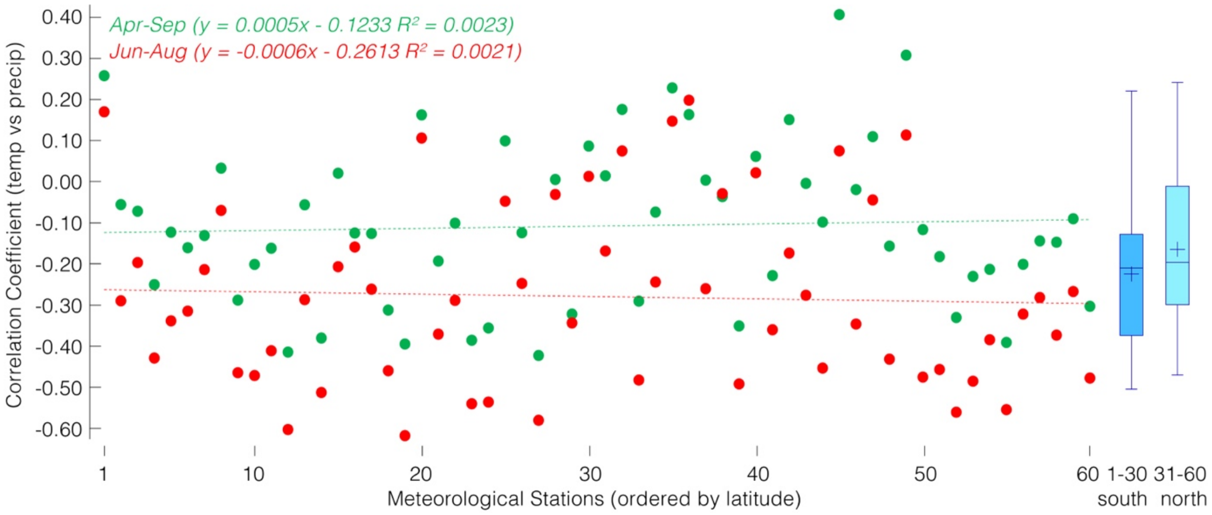
Supplementary Figures S1–S5, Supplementary Inventory S1



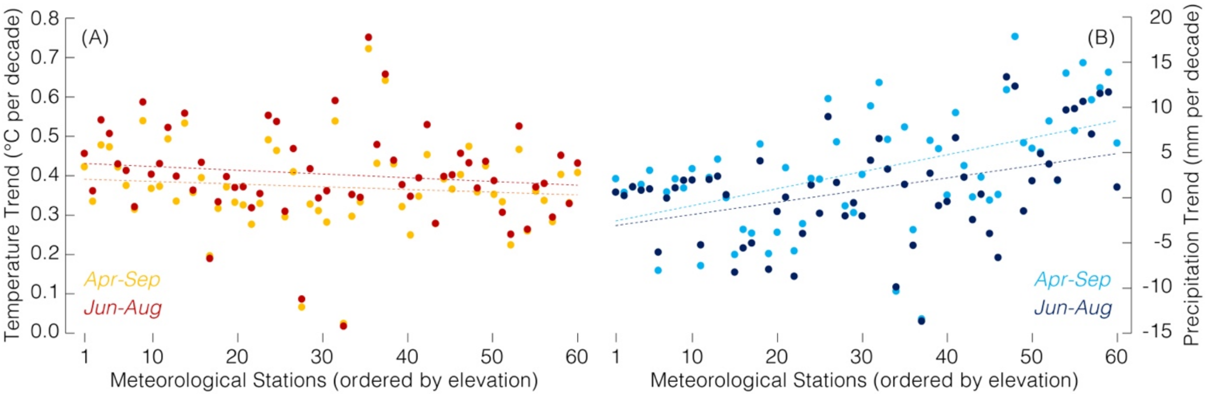
Supplementary Figure S1. Correlations between detrended temperature and precipitation data changes with elevation across the eastern Tibetan Plateau. Correlation coefficients between temperature means and precipitation totals at each of the 60 meteorological stations, calculated over 1958–2014 for three-month (June-August; red) summer and six-month (April-September; green) warm season intervals using detrended timeseries, i.e., the first difference. Dashed lines are linear trends of the seasonal correlation coefficients, and boxplots emphasise significant differences in temperature-precipitation covariance between the 30 lowest and 30 highest meteorological stations.



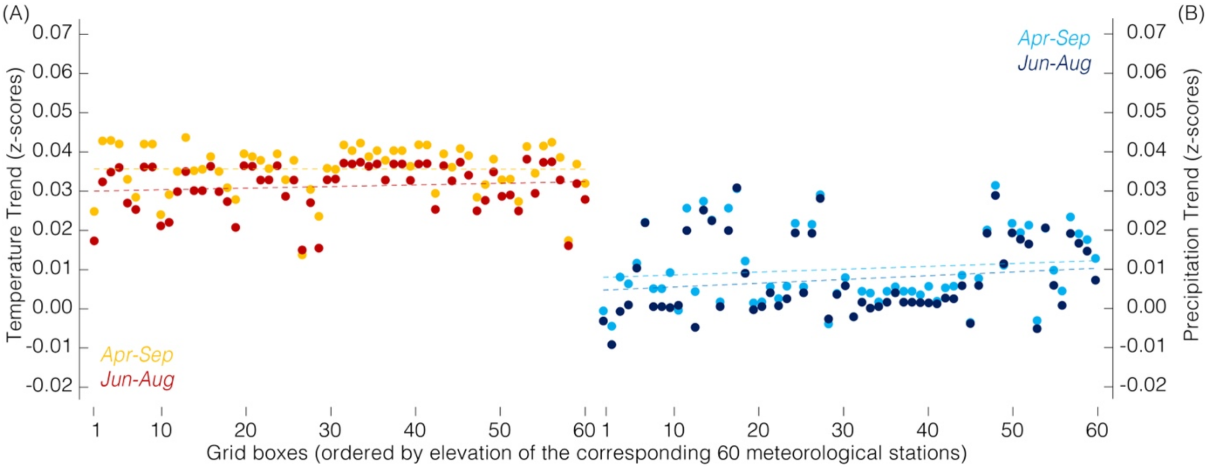
Supplementary Figure S2. Correlations between summer temperature and precipitation does not depend on elevation across the eastern Tibetan Plateau in a gridded dataset. Correlation coefficients between temperature means and precipitation totals using gridded 0.5° latitude by 0.5° longitude indices (CRU TS v. 4.08; Harris et al. 2020) closest to the original 60 meteorological stations. Correlations were calculated over 1958–2014 for three-month (June-August; red) summer and six-month (April-September; green) warm season intervals. Dashed lines are linear trends of the seasonal correlation coefficients, and boxplots emphasise that there is little difference in the covariance between temperature and precipitation when considering the 30 lowest and 30 highest grid cells separately. Similar results were obtained when using the gridded dataset from China (0.025° x 0.025°; Zhao et al. 2019).



Supplementary Figure S3. Correlations between summer temperature and precipitation does not depend on latitude across the eastern Tibetan Plateau weather stations. Correlation coefficients between temperature means and precipitation totals at each of the 60 meteorological stations sorted by increasing latitude from left to right. Correlations were calculated over the period 1958–2014 for three-month (June-August; red) summer and six-month (April-September; green) warm season intervals. Dashed lines are linear trends of the seasonal correlation coefficients, and boxplots emphasise that there is little difference in the covariance between temperature and precipitation when considering the 30 most southern and 30 most northern stations separately.



Supplementary Figure S4. Long-term trends in temperature and precipitation at meteorological stations. (**A**) Absolute changes in summer (June-August) and warm season (April-September) temperature means (°C per decade) recorded by the 60 meteorological stations between 1958 and 2014. (**B**) Absolute changes in summer (June-August) and warm season (April-September) precipitation totals (mm per decade) recorded by the 60 meteorological stations between 1958 and 2014 (see Fig. 5 for comparable z-score trends). Except for two stations (27 and 32), temperature exhibits significant positive trends at the 0.01 level.



Supplementary Figure S5. Long-term trends in temperature and precipitation in a gridded dataset. (**A**) Relative changes in summer (June-August) and warm season (April-September) temperature means (z-scores) between 1958 and 2014. (**B**) Relative changes in summer (June-August) and warm season (April-September) precipitation totals (z-scores) between 1958 and 2014. All values are based on gridded 0.5°

latitude by 0.5° longitude indices (CRU TS v. 4.08; Harris et al. 2020) closest to the original 60 meteorological stations.