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## Human influence strengthens the contrast between tropical wet and dry regions

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Climate models predict a strengthening contrast between wet and dry regions in the tropics and subtropics (30°S-30°N), and data from the latest model intercomparison project (CMIP6) support this expectation. Rainfall in ascending regions increases, and in descending regions decreases in both climate model and reanalysis data. This strengthening contrast can be captured by tracking rainfall change each month in the wettest and driest third of the tropics and subtropics combined. Since wet and dry regions are selected individually for each model ensemble member, and the observations, and for each month, this analysis is largely unaffected by biases in location of precipitation features. Blended satellite and in situ data support the model-simulated tendency to sharpening contrasts between wet and dry regions, with rainfall in wet regions increasing substantially contrasted by a slight decrease in dry regions. These new datasets allow us to detect with more confidence the effect of external forcings on these changes, attribute them for the first time to the response to anthropogenic and natural forcings separately, and determine that the observed trends are statistically larger than the model responses. Our results show that the observed change is best explained by increasing greenhouse gases with natural forcing contributing some increase following the drop in wet region precipitation after Mount Pinatubo, while anthropogenic aerosol effects are expected to show a weak tropic-wide trend at the present time of flat global aerosol forcing. As expected from climate models, the observed signal strengthens further when focusing on the wet tail of spatial distributions in both models and data.