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# Future Precipitation Changes in North America in a Warmer Climate

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Future predictions in regional precipitation changes under global warming have heavily relied on the climate model simulations. Understanding the physical mechanisms of future hydroclimate changes in responses to different forcings will help improve our confidence in the model projections. Here we investigated the future precipitation changes in North America using the high-resolution(~50km) climate model GFDL-AM4, alongside other CFMIP models. We analyzed both the mean and extreme precipitation changes in the region during different seasons in response to distinct forcings: quadruple CO2, uniform SST warming, and a more realistic SST warming pattern. We noticed that the precipitation changes in North America are more sensitive to CO2 forcing in the summer than in the winter. The overall precipitation tends to decrease due to CO2 forcings and increases due to uniform warming. We will demonstrate the physical mechanisms of how CO2 suppresses the precipitation in the summer and how warmer climate can amplify the precipitation in most North American regions. To address uncertainties in future hydroclimate projections for North America, we will leverage multiple CFMIP models, providing a robust evaluation of model reliability in predicting these changes.