

Climate Change: Impacts of Global Warming on the Hydrological Cycle

The goals of this research are: 1) to better understand how the increases in greenhouse gases and anthropogenic aerosols modify the intensity and distribution of rainfall; and 2) to better understand how changes the atmospheric circulation further amplifies the rainfall changes through radiative feedbacks involving clouds and water vapor. We use global climate model simulations that performed as part of the Coupled Model Intercomparison Project (CMIP6) to examine the response of rainfall to both realistic and idealized emission scenarios. These simulations are used in conjunction with detailed feedback analyses to better understand the contributions of individual climate feedbacks to the changes in rainfall and atmospheric circulation. Historical observations are used to constrain the range of model simulations over the 20th Century and provide improved projections of future rainfall change.

