Geophysical Research Abstracts
Vol. 16, EGU2014-4599, 2014
EGU General Assembly 2014
© Author(s) 2014. CC Attribution 3.0 License.

Atmospheric fronts and related rainfall in current and future climate

Jennifer Catto
Monash University, Melbourne, Australia (jennifer.catto@monash.edu)

Atmospheric fronts play an important role in providing rainfall, particularly in the midlatitudes, and they can be associated with heavy rain and flooding. Potential future changes in the frequency, location, and intensity of fronts, and the associated rainfall will have huge socioeconomic impacts. Here we have evaluated the representation of fronts and their associated precipitation in the CMIP5 climate models, and identified how they may change in the future.

We applied an objective front identification method to reanalysis data and the CMIP5 models and linked the fronts with the corresponding daily precipitation. The models capture well the spatial distribution and magnitude of the frequency of fronts. The total precipitation error in the models can be decomposed into components associated with the frequency and intensity of both frontal and non-frontal precipitation. The total precipitation error decomposition shows that while the models have small biases, there are compensating errors, with both frontal and non-frontal rain occurring too often with too low intensity.

Fronts and their associated precipitation have been identified in the RCP8.5 scenario data and compared against the historical simulations to investigate the future changes in the frequency and location of fronts, and the intensity of front-related precipitation.