

EGU2020-20963

<https://doi.org/10.5194/egusphere-egu2020-20963>

EGU General Assembly 2020

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Long-term change of warm-season precipitation climatology in South Korea

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This study examines long-term changes of precipitation characteristics in South Korea focusing on warm season (June-September). Daily precipitation data are obtained from 15 surface stations that have continuously observed precipitation for 58 years (1961 – 2018). Precipitation characteristics and their long-term changes are examined including trend, amount, and intensity. The warm-season precipitation in South Korea is largely affected by the East Asian Summer Monsoon, which causes rainy season in late July and mid August (these are called “Changma” and “Post-Changma” seasons in Korea). Thus, these characteristics are also analyzed focusing on Changma season.

The warm-season precipitation increased roughly by 1.0 mm per day for the last thirty years. The change is particularly pronounced during Changma season, and it shows 1.6 mm of daily precipitation increase. Trend analysis for the 58 years also showed a consistent and significant result. The precipitation change is mostly founded in the intensity of 30 – 110 mm per day implying that the precipitation intensity is increasing in warm season. Multiple regression analysis further suggests that this change is more related to precipitation intensity than precipitation frequency. Global precipitation data reveals the similar change in precipitation over central eastern China presenting a band-like precipitation increase extending to the Korean peninsula. These results are likely caused by near-surface temperature and moisture increase in a warming climate.