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Rainfall Variation under Different Climate Change Scenarios Based on CMIP3 and CMIP5 Projections: A Case Study in Taiwan

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ABSTRACT

This study aims to investigate the rainfall variation under different climate change scenarios based on CMIP3 and CMIP5 projections. For this purpose, the scenario rainfall data were first collected from Taiwan Climate Change Projection and Information Platform (TCCIP) which provides a grid-based rainfall and temperature downscaled product for Taiwan with a fine resolution of 5km-by-5km. Then, a comparison of CMIP3 rainfall and CMIP5 rainfall was made for several study areas in Taiwan. Such comparison can help to identify zones with significant difference between CMIP3 and CMIP5 rainfall. So far all adaptation strategies to the high risk flood or drought areas in Taiwan were based on the CMIP3 downscaled data. It will not be practical to run all risk assessment projects again with CMIP5 downscaled data. Thus, the comparison will be critical for finding potential zones where the risk assessment project should be inspect again. After identifying zones with significant difference, the study will run the subsequent analysis such as water supply simulation and inundation simulation based on CMIP5 data. The upstream of primary watersheds in four main parts of Taiwan (Northern, Central, Southern and Eastern) and five watersheds (Tamsui River, Dajia River, Zhuoshui River, Zengwen River and Gaoping River) were selected as study areas in the study. The preliminary results indicate that the zones with relatively significant difference (between CMIP3 and CMIP5) are mainly located in Tamsui River watershed and Central Taiwan.