



Analysis of hydrologic variation under climate change environment in southern Taiwan

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Impact and adaptation is an important issue in response to climate change. We need to know the affections of climate change on hydrologic characteristics before estimating the impacts and making adaptation strategies of concerned area. The wet and dry seasons of southern Taiwan are significant. In addition, the amount of average annual rainfall is about 2,100mm in southern Taiwan. Most of rainfalls happen in wet season and are caused by cyclones (typhoons) or thunderstorms in wet season. It implies that both quantity and intensity of rainfall are large in wet season, while they are small in dry season. Corresponding to the phenomena, the possibility of flood in wet season and draught in dry season is high. This means significant hydrologic variations may cause disasters. The purpose of this study is to analyze hydrologic variation due to recent climate changes in southern Taiwan, and provide decision makers some information to understand possible impacts and make adaptation strategies. Before typhoon Morakot hit Taiwan, southern Taiwan was suffering from aridity. As usual, people were expecting the rainfall accompanied with typhoons will resolve the drought in this area. However, it fell down huge amount of water within a short period of time and the rain became a big disaster in this area. The rainfall is an over 200-year event, a record breaker.

The data used in this research is based on the records of Taiwan Central Weather Bureau at Chiayi, Tainan, Kaohsiung, and Hengchun station, respectively. The trends of temperature, amount of rainfall, and number of rainy days are examined. Both Mann-Kendall trend test and linear regression method are chosen as the means to do trend examination. The results show that annual mean temperatures at Chiayi, Tainan, Kaohsiung, and Hengchun have raised 0.5~0.9°C during past decades under the impact of global warming. The amount of annual rainfall does not appear statistically significant trend. However, the number of annual rainy day is reduced by 15%. It suggests that rainfall intensity is increased and the mean length of drought period is increased as well, generally. That means possibility of flood and drought is becoming larger in future. Decision makers should pay more attentions about it and proceed adaptation strategies plans.