

發展流域時雨量預估方法之研究

Developing a methodology for hourly rainfall forecasting

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摘要

颱風侵臺期間帶來的強烈降雨常引發許多嚴重災害，造成民眾生命與財產損失。若能於防救災應變作業時獲知準確的降雨預估資訊，將可減輕災害損失。因此，國研院台灣颱風洪水研究中心整合學研界研發能量，執行定量降雨系集實驗(Taiwan Cooperative Precipitation Ensemble Forecast Experiment, TAPEX)，提供颱風期間定量降雨系集預估資訊，供防救災相關單位參考與應用。然而，現階段 TAPEX 針對未來 1~6 小時之雨量推估仍有較大的不確定，故需發展可對 TAPEX 時雨量預估資訊進行整合之方法。本研究針對濁水河流域，首先探討 TAPEX 對該流域未來 1~6 小時雨量的推估表現。接著，使用類比(Analog)概念與即時觀測雨量資料，發展降雨特性類比法。實際測試的結果顯示，藉由本研究發展之方法整合 TAPEX 預估資訊，確可降低未來 1~6 小時雨量預估的不確定性，亦可提升預估準確度。因此，透過 TAPEX 並配合本研究發展之整合方法，可即時提供防救災單位正確時雨量預估資訊，減少傷亡與損失。

關鍵詞：定量降雨系集實驗，類比法，濁水河流域

Abstract

During typhoon events, heavy rainfall often causes serious damages and leads to loss of life and property. If accurate information about future rainfall could be provided to the work of disaster prevention and mitigation, the loss of life and property would be reduced. Therefore, Taiwan Typhoon and Flood Research Institute, which belonged to the National Applied Research Laboratories, cooperates with academic and research institutions to perform Taiwan Cooperative Precipitation Ensemble Forecast Experiment (TAPEX) for providing typhoon rainfall forecasts to disaster prevention agencies. However, at present time, there is much uncertainty when using the 1- to 6-h ahead rainfall forecasts from TAPEX. It is needed to develop a methodology to have better forecasting performance. In this study, we first evaluate the performance of rainfall forecasts provided by TAPEX in the Cho-Shui River basin. Then, a rainfall characteristic analog methodology is proposed based on the use of the analog concept and observed rainfall data. An actual application is performed and the result

indicates that by applying the proposed methodology on the 1- to 6-h ahead rainfall forecasts from TAPEX, the forecasting uncertainty is reduced and the performance is improved. Hence, by using the TAPEX rainfall forecasts with the proposed methodology, it is considered promising to provide accurate rainfall forecasts to disaster prevention agencies to reduce the loss of life and property.

Keywords: Taiwan Cooperative Precipitation Ensemble Forecast Experiment, Analog methodology, the Cho-Shui River basin