**Prediction of Coastal Flood in Bangladesh using WRF-Hydro Model: A Case Study for Super Cyclone *Amphan***

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**Abstract**: Tropical cyclones are a very common phenomena in Bangladesh. Along with many other hazards associated with the tropical cyclones, coastal flood is a very disastrous one. Predicting such types of floods are a bit tricky, since the coastal regions get usually inundated due to excessive rainfall during the cyclone events. A very common approach for prediction of coastal floods is to simulate the storm surge and then correlate the surge heights to the prescribed heights of water level to be considered as the danger level for declaring a flood event. A novel approach has been tried and tested in this research. The coupled atmospheric-hydrometeorological model, WRF-Hydro, has been utilized to predict the coastal flood in Bangladesh; with the case of Super Cyclone *Amphan* being the test case. A simulation period of 168 hours, prior to the landfall of the cyclone, were made. The results show that the model has a gradual increase of accuracy in forecast. The accuracy has been found to be 74%, 79%, 87%, 91% and 94% for 120 hours, 96 hours, 72 hours, 48 hours and 24 hours respectively before the flood activities. The NSE, PBIAS and RSR scores for the simulated results verified that the model performed well for prediction of coastal flood during that time. Therefore, the WRF-Hydro model has a great potential for further uses in future coastal floods owing to the occurrences of tropical cyclones at Bay of Bengal.

**Keywords**: Coastal Flood, WRF-Hydro Model, Super Cyclone Amphan, Forecast Accuracy, NSE.