



## Comparison of Artificial Neural Network And M5 Model Tree Technique In Water Level Forecasting of Solo River

Umboro Lasminto (1) and Listya Hery Mulartha (2)

(1) Doctoral Student of Graz University of Technoloy (TU Graz) and Lecturer of Civil Engineering Department, Institut Teknologi Sepuluh Nopember Surabaya, Indonesia (Fax;+62315947284), (2) Master Student of Hydroinformatic MRSA, Civil Engineering Department, Institut Teknologi Sepuluh Nopember Surabaya, Indonesia (Fax;+62315947284)

Flood events along the Solo River flow at the end of December 2007 has caused lose of properties and lives. Floods occurred in the city of Ngawi, Madiun, Bojonegoro, Babat and surrounding areas. To reduce future losses, one of the important efforts that will occur during a flood is to get information about the magnitude and time will be floods, so that people can make an effort to reduce its impact. Flood forecasting model can provide information of water level in the river some time before the incident. This paper will compare the flood forecasting model at Bojonegoro City was built using the technique of Artificial Neural Network (ANN) and M5 Model Tree (M5MT). The model will forecast the water level of 1, 3 and 6 hours ahead at the point of water level recorders in the City of Bojonegoro using input from the water level at some point water level recorders in the upstream such as Karangnongko, Sekayu, Jurug and Wonogiri. The same data set of hourly water level records are used to build the model of ANN and M5MT technique. The selection of parameters and setup of ANN and M5MT technique is done to obtain the best result. The results of the model are evaluated by calculating the Root Mean Square Error (RMSE) between the predictions and observations.

RMSE produced by the water level forecasting model 1, 3 and 6 hours ahead with M5MT technique are 0.2723, 0.6279 and 0.7176 meters. While the ANN technique are 0.1829, 0.3192 and 0517 meters. ANN technique has a better ability in predicting low flow, whereas M5 Model Tree technique has a better ability in predicting high flow.

Keywords : Water level forecasting, Solo River, M5 Model Tree, Artificial Neural Network