ABSTRACT

A flood forecasting by rainfall data or discharge has not been implied well in most of areas in Indonesia. It is caused by the existence of equipment so data will be uncompleted. Needed a modeling is to know runoff on each catchment area. Along with the development of satellite technology, there is technology named Geographic Information System (GIS) which come with its application and program.

A program is to make hydrology modeling using distributed and tank model called Integrated Flood Analysis System (IFAS). In this case, model will be made for Bengawan Solo Catchment Area. The purpose of model is to know how big the goodness of IFAS modeling when it will compare with measurement data.

The main problem of this case is how to make model of Bengawan Solo catchment area in IFAS, parameter calibration of surface, subsurface, aquifer and river course. Next, it will find the best model according to discharge from AWLR (Automatic Water Level Recording) of Bengawan Solo using three types of test: Root Mean Square Error (RMSE), Nash and Volume Error (VE).

Watershed model of IFAS will be made in five types (default, 1, 2, 3 and 4) which each model will have different rate of parameter. Determination of parameter is taken by analysis of impact of each parameter to the graph shape. Changes of parameter will impact to the hydrograph.

According to simulation model and three tests before, the best model is model 4. Model 4 has RMSE 3.097, Nash 0.955, and VE 0.0000442%. This model said as the best is under the limit of RMSE (gain to zero), Nash (gain to one) and VE (under 5%). Using three tests before, parameter of model 4 will be validated to the same location but different period.

Validation of model in different period will result performance which is not as good as before. In other hand, the value of test is still under the edge. This model has rate value for RMSE 6.88, Nash 1.106 and VE 0.28%.

Kata kunci : Bengawan Solo catchment area, IFAS, modeling, rainfall, runoff, satellite
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