

PENDUGAAN DEBIT ALIRAN SUNGAI PADA DAERAH ALIRAN SUNGAI SERANG MENGGUNAKAN MODEL HIDROLOGI MOCK

INTISARI

Oleh:

Troy Arthur Wicaksono
13/346886/TP/10629

Pemodelan hidrologi dapat membantu pengelolaan sumberdaya air di suatu Daerah Aliran Sungai (DAS). Penelitian ini menggunakan Model Mock untuk menduga debit aliran sungai di DAS Serang. Pendugaan debit aliran dikaji berdasarkan curah hujan, evapotranspirasi, serta neraca kesetimbangan air di dalam tanah. Metode rata-rata aljabar digunakan untuk menganalisis curah hujan, sedangkan metode Penman-Monteith digunakan untuk menganalisis evapotranspirasi referensi. Data debit DAS Serang pada SPAS Pekik Jamal tahun 2008 dan 2009 masing-masing digunakan untuk kalibrasi dan verifikasi Model Mock. Kalibrasi Model Mock menggunakan nilai-nilai indikator statistik yaitu koefisien korelasi (R), volume error (VE) dan koefisien efisiensi Nash-Sutcliffe (NSE). Kalibrasi Model Mock dilakukan dengan mengubah parameter-parameter agar optimal melalui *add in Solver* pada *Microsoft Excel*. Hasil kalibrasi menunjukkan nilai R, VE, dan NSE masing-masing sebesar 0,978, 1,192%, 0,927. Verifikasi model menghasilkan nilai R sebesar 0,954, VE sebesar 10,543%, dan NSE sebesar 0,885. Simulasi Model Mock tahun 2008 hingga tahun 2016 divalidasi dengan diagram *scatter* dan menghasilkan nilai koefisien determinasi (R^2) sebesar 0,8434. Berdasarkan nilai kalibrasi, verifikasi, dan validasi debit simulasi, model ini dapat digunakan untuk pendugaan debit di DAS Serang

Kata Kunci: Model Hidrologi Mock, Optimasi, Debit Simulasi

PREDICTION OF RIVER DISCHARGE IN SERANG WATERSHED USING MOCK HYDROLOGY MODEL

ABSTRACT

By:

Troy Arthur Wicaksono
13/346886/TP/10629

Hydrologic model can be used to help the management of water resources in a Watershed. In this research Mock Hydrology Model applied to predict monthly mean river discharge in Serang Watershed. Discharge prediction was measured based on the rainfall, evapotranspiration, and water balance in the soil system. The algebraic mean calculation was used to analyze mean area rainfall, while Penman-Monteith method was used to analyze the reference evapotranspiration. Statistic indicators such as Corelation Coefficient ($R \geq 0,75$, volume error ($VE \leq 5\%$ and Nash-Sutcliffe Efficiency Coefficient ($NSE \geq 0,75$ were used in Mock Model calibration. Discharge data on Pekik Jamal Water Level Observation Station in 2008 and 2009 used as Mock Model calibration and verification input data. Mock Model calibrated by changing the value of parameters to the optimal value using Solver Add-In on Microsoft Office Excel. The result of model calibration showed that the value of R, VE, and NSE for each was 0,978, 1,192%, 0,927. Model verification resulted that the value of R was 0,954, VE was 10,543%, and NSE was 0,885. Model simulation generates river discharge from year 2008 to 2016, which validated by scatter diagram and resulted that coefficient of determination (R^2) was 0,8434. Based on the result of calibration, verification, and validation of simulated discharge, this model is able to predict river discharge in Serang Watershed .

Keywords: Mock Hydrologic Model, Optimation, Simulated Discharge