INTISARI

Dalam analisis transformasi hujan aliran khususnya penentuan hidrograf banjir rancangan dibutuhkan data pola distribusi hujan. Analisis pola distribusi hujan sangat bergantung terhadap data hujan durasi pendek yang umumnya masih sangat terbatas. Untuk mengatasi permasalahan tersebut dapat digunakan data hujan satelit. Namun penggunaan data hujan satelit masih memiliki peluang kesalahan akibat bias yang disebabkan oleh beberapa faktor. Oleh sebab itu dalam penggunaan data hujan satelit masih harus dikoreksi dengan melakukan analisis koreksi bias. Penelitian ini dilakukan untuk mengetahui akurasi hidrograf banjir akibat data hujan satelit terhadap hasil perhitungan hidrograf banjir yang disebabkan oleh data hujan permukaan.

Penelitian diawali dengan menentukan wilayah penelitian dan dilanjutkan dengan melakukan koreksi bias data hujan satelit PERSIANN dan GPM terhadap data hujan permukaan terukur dengan uji koreksi bias *Linear Scaling* (LS). Penelitian dilanjutkan dengan melakukan analisis hujan dominan data hujan permukaan, satelit, dan satelit terkoreksi. Dari hasil analisis hujan dominan kemudian dilakukan analisis pola distribusi hujan tahun data 2016 – 2020. Tahapan selanjutnya dilakukan analisis hujan rancangan dengan menggunakan data hujan harian maksimum tahun 2000 – 2020, dan dilanjutkan dengan analisis Hidrograf Satuan Sintetis (HSS) Nakayasu. Perhitungan hujan efektif dilakukan dengan menggunakan metode *Soil Conservation Service – Curve Number* (SCS – CN). Tahapan berikutnya dilakukan analisis hidrograf banjir untuk masing – masing data dan wilayah penelitian yang dilanjutkan dengan analisis akurasi dan korelasi data menggunakan metode *Pearson Product Moment* (PPM), *Normalized Root – Mean Squared Error* (Nrmse), dan *bias*.

Hasil penelitian menunjukkan dengan meninjau ketiga wilayah penelitian diketahui data hujan satelit GPM terkoreksi bias memiliki penyimpangan debit puncak banjir rata – rata terkecil yaitu sebesar 14,51%. Hal ini didukung oleh hasil analisis korelasi dan akurasi hidrograf banjir yang menunjukkan data hujan satelit GPM terkoreksi bias memiliki kedekatan rata – rata yang terbaik dengan nilai koefisien korelasi PPM sebesar 0,93915, koefisien Nrmse sebesar 0,00586, dan koefisien bias sebesar 0,00005.

Kata kunci: hujan terukur, PERSIANN, GPM, pola distribusi hujan, hidrograf banjir,

ABSTRACT

In the analysis of rain flow transformation especially the determination of the design flood hydrograph, rainfall distribution pattern data is needed. Analysis of rainfall distribution patterns is very dependent on short duration rainfall data which is generally still very limited, to overcome these problems satellite rainfall data can be used. However, the use of satellite data still has the opportunity for errors due to bias caused by several factors, therefore the use of satellite data still has to be corrected by conducting a bias correction analysis. This research was conducted to determine the reliability of satellite data in approaching the results of the design flood hydrograph calculations caused by the measured data.

The study begins with determining the research area and continues with bias correction analysis of PERSIANN and GPM satellite rainfall data on the measured data using the Linear Scaling (LS) bias correction test. The research was continued by analyzing the dominant rainfall on measured data, satellites, and corrected satellites. From the results of the dominant rainfall analysis, an analysis of the distribution pattern of the 2016 – 2020 data was carried out. Then an analysis of the design rainfall was carried out using the maximum daily rainfall data for the year of 2000 – 2020, and continued with the Nakayasu Synthetic Unit Hydrograph analysis. Calculation of effective rain is carried out using the Soil Conservation Service – Curve Number (SCS – CN) method. Then, flood hydrograph analysis was carried out for each data and research area, followed by analysis of accuracy and correlation of data using the Pearson Product Moment (PPM) method, Normalized Root – Mean Squared Error (Nrmse) method, and bias.

The results show that by reviewing the three research areas, it is known that the bias-corrected GPM data has the smallest average peak flood discharge deviation of 14,51%. This is supported by the results of the correlation analysis and the accuracy of the flood hydrograph which shows that the bias-corrected GPM data has the best average closeness with a PPM correlation coefficient of 0,93915, a Nrmse coefficient of 0.00586, and a bias coefficient of 0.00005.

Keywords: measured rainfall, PERSIANN, GPM, rainfall distribution pattern, flood hydrograph.