

Variasi Spasial dan Temporal Tingkat Bahaya Banjir di DAS Citarum Hulu Periode 2000-2020 = Spatial and Temporal Variation of Flood Hazard in Upper Citarum Watershed 2000-2020 Period

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Abstrak

Banjir merupakan bahaya hidrometeorologis dengan risiko paling tinggi dan luas secara global termasuk di Indonesia. DAS Citarum Hulu yang berada di Provinsi Jawa Barat, memiliki kondisi fisik dan iklim yang berpengaruh terhadap kejadian banjir. Model Soil and Water Assessment Tool (SWAT) merupakan semi-distributed dan continuous-time model mampu memperhitungkan bahaya banjir secara spasial dan temporal. Tujuan penelitian ini adalah menganalisis variasi spasial dan temporal debit aliran hasil simulasi model SWAT dan tingkat bahaya banjir di DAS Citarum Hulu periode 2000-2020. Pengolahan data berlangsung pada model SWAT dengan menggunakan variabel iklim, penggunaan lahan, jenis tanah, dan topografi. Model SWAT menghasilkan debit aliran untuk pengolahan tingkat bahaya banjir menggunakan Flood Exceedance Probability Index. Analisis spasial dan temporal adalah variasi debit dan tingkat bahaya banjir antara sub-sub DAS, serta antara periode simulasi (2000-2010 dan 2010-2020). Hasil pengolahan data menunjukkan bahwa debit hasil simulasi tertinggi berada di Sungai Citarum dengan variabilitas tertinggi berada di elevasi tertinggi dari DAS Citarum Hulu. Periode simulasi 2000-2010 memiliki variabilitas lebih tinggi. Variasi spasial tingkat bahaya banjir menunjukkan bahwa tingkat bahaya banjir tertinggi berada pada sepanjang Sungai Citarum, sub-sub DAS Cikapundung, serta hulu sub-sub DAS Ciwidey. Secara temporal, terjadi kenaikan dan penurunan tingkat bahaya banjir dari periode 2000-2010 hingga 2010-2020.

.....Flood is a hydrometeorological hazard with the highest and most widespread risk globally, including in Indonesia. The Citarum Upper Watershed in West Java Province, has physical and climatic conditions that influence flood events. The Soil and Water Assessment Tool (SWAT) model is a semi-distributed and continuous-time model capable of calculating flood hazard spatially and temporally. The purpose of this study was to analyze the spatial and temporal variations in flow discharge from the SWAT model simulation and the level of flood hazard in the Upper Citarum watershed for the 2000-2020 period. Data processing takes place in the SWAT model using climate, land use, soil type, and topography variables. The SWAT model generates flow rates for processing flood hazard levels using the Flood Exceedance Probability Index. Spatial and temporal analysis is the variation of discharge and flood hazard level between sub-watersheds, as well as between simulation periods (2000-2010 and 2010-2020). The results of data processing show that the highest discharge from the simulation results is in the Citarum River with the highest variability in the highest elevation of the Upper Citarum watershed. The 2000-2010 simulation period has higher variability. Spatial variations in the level of flood hazard indicate that the highest level of flood hazard is along the Citarum River, the Cikapundung sub-watershed, and the upstream of the Ciwidey sub-watershed. Temporarily, there has been an increase and decrease in the level of flood hazard from the 2000-2010 to 2010-2020 period.