

**TREN CUACA EKSTRIM DAN
BENCANA HIDROMETEOROLOGI DI SUMATERA
SELAMA 2008-2020 DARI DATA *INTEGRATED MULTI-
SATELLITE RETRIEVALS FOR GPM (IMERG)* DAN BNPB**

TESIS



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ABSTRAK

Berbagai peristiwa cuaca ekstrim yang diikuti oleh bencana hidrometeorologi memberikan dampak signifikan di Sumatera. Namun, penelitian mengenai korelasi antara tren indeks cuaca ekstrim dan tren bencana hidrometeorologi di wilayah ini masih menantang. Oleh karena itu, penelitian ini menganalisis tren cuaca ekstrim dan bencana hidrometeorologi di Sumatera pada periode 2008-2020. Data curah hujan diperoleh dari *Integrated Multi-satellite Retrievals for GPM (IMERG)*, dan data bencana hidrometeorologi berasal dari Badan Nasional Penanggulangan Bencana (BNPB). Penelitian ini menggunakan berbagai indeks curah hujan ekstrim, termasuk PRCPTOT, R85P, R95P, R99P, CWD, CDD, R1mm, R10mm, R20mm, R50mm, RX1Day, RX5Day, dan SDII. Bencana hidrometeorologi yang dianalisis melibatkan banjir, tanah longsor, angin puting beliung, kekeringan, dan kebakaran hutan serta lahan. Indeks ekstrim dihitung menggunakan metode Sen's Slope, dan korelasi antara indeks cuaca ekstrim dan bencana hidrometeorologi diukur dengan korelasi Kendall Tau. Secara keseluruhan, indeks R99P, R50mm, Rx1day dan SDII menunjukkan tren penurunan yang signifikan, sedangkan indeks CWD menunjukkan tren peningkatan yang signifikan. Uji Korelasi Kendall Tau menunjukkan bahwa indeks CWD berkorelasi positif paling banyak dengan bencana hidrometeorologi seperti banjir, longsor, dan angin puting beliung. Bencana banjir juga berkorelasi positif paling banyak dengan MJO fase 3 dan fase 4 dibandingkan dengan bencana hidrometeorologi lainnya.

Keywords: Cuaca Ekstrim, Bencana Hidrometeorologi, Sumatera, Sen's Slope, Korelasi Kendall Tau

EXTREME WEATHER TRENDS AND HYDROMETEOROLOGICAL DISASTERS IN SUMATRA DURING 2008-2020 FROM INTEGRATED MULTI-SATELLITE RETRIEVALS FOR GPM (IMERG) AND BNPB DATA

ABSTRACT

Various extreme weather events accompanied by hydrometeorological disasters have had a significant impact on Sumatra. However, researching the correlation between trends in extreme weather indices and trends in hydrometeorological disasters in this region remains challenging. Therefore, this study analyzes the trends in extreme weather and hydrometeorological disasters in Sumatra for the period 2008-2020. Rainfall data were obtained from the Integrated Multi-satellite Retrievals for GPM (IMERG), and data on hydrometeorological disasters were sourced from the National Disaster Management Agency (BNPB). This study involves various extreme rainfall indices, including PRCPTOT, R85P, R95P, R99P, CWD, CDD, R1mm, R10mm, R20mm, R50mm, RX1Day, RX5Day, and SDII. The hydrometeorological disasters analyzed include floods, landslides, tornadoes, droughts, and forest and land fires. The extreme indices are calculated using The Sen's Slope method, and the correlation between extreme weather indices and hydrometeorological disasters is measured using the Kendall Tau correlation. Overall, the R99P, R50mm, Rx1day and SDII indices show a significant decreasing trend, while the CWD index shows a significant increasing trend. The Kendall Tau Correlation Test shows that the CWD index is most positively correlated with hydrometeorological disasters such as floods, landslides and tornadoes. Flood disasters also have the most positive correlation with MJO phase 3 and phase 4 compared to other hydrometeorological disasters.

Keywords: Extreme weather, Hydrometeorological disasters, Sumatera, Sen's Slope, Kendall Tau correlation