INTISARI

ANALISIS RISIKO TSUNAMI BERBASIS PEMODELAN NUMERIK DAN MODEL ELEVASI DIGITAL TAHUN 2023 BERESOLUSI TINGGI DI KALURAHAN TIRTOHARGO, KABUPATEN BANTUL

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Zona subduksi di selatan Pulau Jawa menyebabkan area tersebut rentan terjadi akumulasi *stress* dan gempa. Terdapat beberapa area di zona subduksi yang masih jarang terjadi gempa (*seismic gap*) yang berpotensi memicu tsunami. Penjalaran gelombang tsunami tersebut dapat bergerak hingga mencapai pesisir selatan pantai Pulau Jawa. Oleh karena itu, perlu dilakukan penelitian untuk mengurangi dampak tsunami di pesisir selatan Pulau Jawa.

Penelitian ini menggunakan *Cornell Multi-grid Coupled Tsunami Model* (COMCOT), model matematika berdasarkan persamaan air dangkal sebagai perangkat lunak untuk pemodelan numerik tsunami di Kalurahan Tirtohargo, Kapanewon Kretek, Kabupaten Bantul. Pembuatan model tsunami dilakukan menggunakan data *Digital Surface Model* (DSM) yang berasal dari proses fotogrametri *Unmanned Aerial Vehicle* (UAV). Dari hasil pemodelan tersebut kemudian dilakukan analisis risiko tsunami.

Berdasarkan peta risiko tsunami yang dibuat menunjukkan bahwa persebaran zona risiko tinggi terhadap tsunami di Kalurahan Tirtohargo, Kapanewon Kretek, Kabupaten Bantul seluas 97,78 Ha. Zona dengan tingkat risiko sedang seluas 17,62 Ha dan zona dengan risiko rendah seluas 290,18 Ha. Terdapat sebanyak 890 pemukiman yang berpotensi terdampak tsunami di Kalurahan Tirtohargo, Kapanewon Kretek, Kabupaten Bantul. Hasil penelitian ini diharapkan dapat digunakan sebagai upaya mitigasi tsunami di daerah penelitian.

Kata kunci: Risiko, Tsunami, Fotogrametri UAV, COMCOT, Persamaan Perairan Dangkal

ABSTRACT

TSUNAMI RISK ANALYSIS BASED ON NUMERICAL MODELING AND 2023 HIGH-RESOLUTION ELEVATION MODEL IN TIRTOHARGO VILLAGE, BANTUL REGENCY

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The subduction zone south of Java Island makes the area prone to stress accumulation and earthquakes. There are several areas in the subduction zone where earthquakes are still rare (seismic gaps) that have the potential to trigger tsunamis. The tsunami waves can travel up to the southern coast of Java Island. Therefore, it is necessary to conduct research to reduce the impact of tsunamis on the southern coast of Java Island.

This research uses the Cornell Multi-grid Coupled Tsunami Model (COMCOT), a mathematical model based on the shallow water equation as software for numerical modeling of tsunamis in Tirtohargo Village, Kapanewon Kretek, Bantul Regency. Tsunami modeling was conducted using Digital Surface Model (DSM) data derived from Unmanned Aerial Vehicle (UAV) photogrammetry process. From the modeling results, a tsunami risk analysis was conducted.

Based on the tsunami risk map created, it shows that the distribution of high risk zones for tsunamis in Tirtohargo sub-district, Kapanewon Kretek, Bantul regency is 97,78 hectares. The zone with a medium risk level is 17,62 hectares and the zone with low risk is 290,18 hectares. There are 890 settlements that are potentially affected by the tsunami in Tirtohargo sub-district, Kapanewon Kretek, Bantul regency. The results of this study are expected to be used as tsunami mitigation efforts in the research area.

Keywords: Risk, Tsunami, UAV Photogrammetry, COMCOT, Shallow Water Equation