

## ABSTRAK

Erosi merupakan salah satu permasalahan utama dalam pengelolaan Daerah Aliran Sungai (DAS), terutama pada kawasan yang rentan terhadap degradasi lahan. Penelitian ini bertujuan untuk menganalisis tingkat bahaya erosi pada DAS Tengkorak dengan menggunakan model *Soil and Water Assessment Tool* (SWAT) berbasis Sistem Informasi Geografis (SIG). Pemodelan dilakukan melalui tahapan deliniasi DAS, pembentukan *Hydrological Response Units* (HRU), serta simulasi hidrologi untuk menentukan distribusi erosi berdasarkan parameter kemiringan lereng, jenis tanah, curah hujan, dan penggunaan lahan. Hasil penelitian menunjukkan bahwa tingkat bahaya erosi pada DAS Tengkorak bervariasi, dengan kategori mulai dari sangat ringan hingga sangat berat dengan erosi rata-rata DAS Tengkorak menghasilkan angka sebesar 135.05 ton/ha/tahun, sedangkan hasil erosi untuk setiap unit lahan bervariasi mulai dari 1,94 ton/ha/tahun sampai dengan 1351,58 ton/ha/tahun. Berdasarkan pemodelan SWAT, wilayah dengan kemiringan lereng curam dan lahan terbuka memiliki tingkat erosi tertinggi, terutama di bagian hulu DAS. Verifikasi lapangan menunjukkan adanya kesesuaian antara hasil simulasi SWAT dengan kondisi aktual di lapangan yakni sebesar 78%, di mana daerah dengan tingkat bahaya erosi tinggi cenderung mengalami kehilangan tanah yang signifikan. Hal ini menunjukkan bahwa hasil pemodelan SWAT cukup memadai untuk memodelkan tingkat bahaya erosi.

**Kata Kunci :** Erosi, Pemodelan SWAT (*Soil and Water Assessment Tool*), Sistem Informasi Geografis.

## ABSTRACT

*Erosion is a significant challenge in watershed management, particularly in areas susceptible to land degradation. This study aims to utilize the Soil and Water Assessment Tool (SWAT) model, integrated with Geographic Information Systems (GIS), to assess the erosion hazard level in the Tengkorak watershed. The modeling process involves several stages, including watershed delineation, formation of Hydrological Response Units (HRU), and hydrological simulation. These stages are used to determine the distribution of erosion based on parameters such as slope, soil type, rainfall, and land use. The results showed that the level of erosion hazard in the Tengkorak watershed varied, with categories ranging from very light to very heavy. The average erosion of the Tengkorak watershed was 135.05 tons/ha/year, while the erosion results for each land unit varied from 1.94 tons/ha/year to 1351.58 tons/ha/year. The SWAT model, which is a sophisticated tool used to assess environmental issues, has been instrumental in determining the areas of highest concern. The upper watershed has been identified as a primary focus due to its steep slopes and open terrain, which are conducive to accelerated erosion. The field verification process has been instrumental in validating the model's accuracy. A comparison of the simulation results and actual conditions in the field has shown a 78% match, indicating a high degree of correlation between the two sets of data. This suggests that the SWAT model is an effective tool for assessing the level of erosion hazard in the Tengkorak watershed.*

**Keywords** : *Erosion, SWAT (Soil and Water Assessment Tool) Modelling, Geographic Information System.*