

**STUDI ABRASI PANTAI DAN PENGARUHNYA TERHADAP KONDISI
HIDRODINAMIKA PANTAI, KELURAHAN KALUMEME
KECAMATAN UJUNGBULU KABUPATEN BULUKUMBA
STUDY OF COASTAL ABRASION AND ITS INFLUENCE ON COASTAL
HYDRODYNAMIC CONDITIONS IN KALUMEME VILLAGE, UJUNG
BULU DISTRICT, BULUKUMBA REGENCY.**

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Abstrak

Abrasi pantai merupakan salah satu masalah lingkungan pesisir yang mempengaruhi stabilitas morfologi garis pantai dan proses hidrodinamika laut. Penelitian ini bertujuan menganalisis perubahan garis pantai pada periode 2020-2024 serta menilai hubungan antara abrasi dan kondisi hidrodinamika pantai, meliputi angin, fetch, gelombang, dan pasang surut. Metode penelitian menggunakan pendekatan kuantitatif melalui analisis Digital Shoreline Analysis System (DSAS), perhitungan gelombang metode SMB, distribusi probabilistik Gumbel-Weibull, serta analisis pasang surut metode Admiralty. Data primer diperoleh melalui observasi lapangan dan pengukuran tinggi gelombang serta pasang surut selama 15 hari. Hasil penelitian menunjukkan bahwa perubahan garis pantai di Pantai Kalumeme memperlihatkan 15 titik mengalami akresi dan 10 titik mengalami abrasi. Laju abrasi tertinggi mencapai -4,78 m/tahun, sedangkan akresi tertinggi sebesar +15,67 m/tahun. Arah angin dominan berasal dari timur (44,53%) dan barat (15,84%), yang menghasilkan gelombang signifikan dengan tinggi antara 0,09-0,56 m. Pola pasang surut tergolong campuran condong harian ganda berdasarkan nilai Formzahl 1,495. Interaksi antara proses hidrodinamika menyebabkan redistribusi sedimen dan memicu hotspot abrasi pada segmen pantai yang terbuka terhadap gelombang barat daya. Hasil ini memberikan dasar ilmiah bagi pengelolaan pesisir dan mitigasi abrasi di Kabupaten Bulukumba.

Kata kunci: Abrasi pantai, Hidrodinamika, DSAS

Abstract

Coastal abrasion is a major environmental issue that affects shoreline morphology and nearshore hydrodynamic processes. This study aims to analyze shoreline changes along the Kalumeme Coast during the period 2020-2024 and evaluate the relationship between abrasion and hydrodynamic conditions, including wind, fetch, waves, and tides. A quantitative approach was employed using the Digital Shoreline Analysis System (DSAS), wave estimation through the SMB method, probabilistic distribution analysis with Gumbel-Weibull, and tidal analysis using the Admiralty method. Primary data were obtained through field observations and measurements of wave height and tidal fluctuations over a 15-day period. The results indicate that shoreline changes in Kalumeme show 15 locations experiencing accretion and 10 locations undergoing abrasion. The highest abrasion rate reached -4.78 m/year, while the maximum accretion was $+15.67$ m/year. Dominant wind directions originate from the east (44.53%) and west (15.84%), generating significant waves with heights ranging from 0.09 to 0.56 m. Tidal characteristics are classified as mixed, predominantly semidiurnal, based on a Formzahl value of 1.495. The interaction of hydrodynamic processes drives sediment redistribution and triggers abrasion hotspots along coastal segments exposed to southwest-directed waves. These findings provide an important scientific basis for coastal management and abrasion mitigation efforts in Bulukumba Regency.

Keywords: Coastal abrasion, Hydrodynamics, DSAS