

MUHAMMAD ZAIKI ZAKARIYYA. NIM 22.03.4.1.1.00057. Analisis Perubahan Garis Pantai Menggunakan Metode *Digital Shoreline Analysis System* (DSAS) Di Pulau Gili Ketapang, Probolinggo. Dibawa bimbingan **Ilham Cahya., S.T., M.T**

ABSTRAK

Wilayah pesisir sangat rentan terhadap perubahan lingkungan, baik akibat kegiatan antropogenik ataupun akibat dari kondisi alam. Pulau Gili Ketapang adalah salah satu wilayah pesisir yang sangat rentan terhadap perubahan dinamika pergeseran garis pantai tersebut. Penelitian ini bertujuan untuk memvalidasi ketelitian ekstraksi garis pantai dan menganalisis dinamika kerentanannya menggunakan algoritma *Modified Normalized Difference Water Index* (MNDWI) dan metode *Digital Shoreline Analysis System* (DSAS). Data dikumpulkan dari sumber primer dan sekunder, yang meliputi citra satelit Sentinel-2A melalui *website copernicus*, serta data pengukuran lapangan menggunakan instrumen RTK GPS. Perhitungan RMSE menghasilkan nilai sebesar 7,6meter. Berdasarkan analisis DSAS, periode 2016-2025 menunjukkan dominasi abrasi pada pulau gili Ketapang. Terdapat fenomena menarik dimana pada 2016-2020 terjadi abrasi bagian utara dan barat pulau, namun dibagian selatan pulau didominasi akresi ditandai dengan tren penambahan daratan yang stabil sejauh 40,02meter selama kurang lebih 9 tahun.

Kata Kunci: Abrasi, Akresi, *Digital Shoreline Analysis System* (DSAS), Garis Pantai, Gili Ketapang, *Modified Normalized Difference Water Index* (MNDWI).

MUHAMMAD ZAIKI ZAKARIYYA. NIM : 22.03.4.1.1.00057. *Analysis of Shoreline Changes Using the Digital Shoreline Analysis System (DSAS) Method on Gili Ketapang Island, Probolinggo. Supervised by Ilham Cahya, S.T., M.T.*

ABSTRACT

Coastal areas are highly vulnerable to environmental changes, driven by both anthropogenic activities and natural conditions. Gili Ketapang Island is one such coastal area that is highly susceptible to the dynamics of shoreline shifts. This study aims to validate the accuracy of shoreline extraction and analyze its vulnerability dynamics using the Modified Normalized Difference Water Index (MNDWI) algorithm and the Digital Shoreline Analysis System (DSAS) method. Data were collected from primary and secondary sources, including Sentinel-2A satellite imagery acquired from the Copernicus platform, as well as field measurement data using an RTK GPS instrument. The RMSE calculation yielded a value of 7.6 meters. Based on the DSAS analysis, the 2016–2025 period indicates a dominance of abrasion on Gili Ketapang Island. An interesting phenomenon was observed where the northern and western parts of the island experienced abrasion from 2016 to 2020, whereas the southern part was dominated by accretion, characterized by a stable landward expansion trend reaching 40.02 meters over approximately 9 years.

Keywords: *Abrasion, Accretion, Digital Shoreline Analysis System (DSAS), Gili Ketapang, Modified Normalized Difference Water Index (MNDWI), Shoreline.*