

PEMANFAATAN CITRA PLANETSCOPE MULTITEMPORAL UNTUK  
DETEKSI DEGRADASI MANGROVE MELALUI IDENTIFIKASI TUTUPAN  
KANOPI: STUDI KASUS DI SEBAGIAN HUTAN MANGROVE TAMAN NASIONAL  
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**ABSTRAK**

Mangrove merupakan sekumpulan pohon yang tumbuh di suatu wilayah yang dipengaruhi oleh kondisi pasang surut. Degradasi ekosistem mangrove, yang ditandai oleh berkurangnya tutupan kanopi dan meningkatnya area terbuka di dalam hutan mangrove. Penelitian ini bertujuan untuk mendeteksi degradasi hutan mangrove secara multitemporal melalui identifikasi persen tutupan kanopi menggunakan citra PlanetScope *Ortho Analytic* 4B SR Level 3B dari tahun 2018 – 2024. Analisis dilakukan menggunakan empat indeks vegetasi diantaranya adalah *Normalized Difference Vegetation Index* (NDVI), *Soil Adjusted Vegetation Index* (SAVI), *Enhanced Vegetation Index* (EVI), dan *Simple Ratio* (SR). Penentuan kondisi degradasi mangrove dilakukan dengan membandingkan model estimasi tutupan kanopi berdasarkan indeks vegetasi paling optimal, serta menetapkan ambang batas degradasi melalui ekstraksi nilai tutupan kanopi dari sampel mangrove terdegradasi.

Hasil penelitian menunjukkan bahwa NDVI merupakan indeks vegetasi paling optimal untuk memetakan persen tutupan kanopi mangrove, dengan nilai  $R^2$  sebesar 0,7048, *Standard Error* 7,523, dan akurasi maksimum mencapai 89,665%. Pemodelan tutupan kanopi mangrove menunjukkan tren peningkatan, terutama sejak 2021, dengan kategori tutupan tinggi (87,5 – 100%) mulai muncul pada 2022 hingga 2024. Hasil klasifikasi degradasi menunjukkan kondisi tutupan mangrove cenderung stabil pada kelas tidak terdegradasi, dengan luasan area terdegradasi menurun dari 62 ha (2018) menjadi 13 ha (2022), lalu sedikit meningkat menjadi 16 ha (2023 – 2024), sedangkan area tidak terdegradasi terus meningkat hingga mencapai 324 ha pada 2024.

**Kata kunci:** Degradasi Mangrove, Tutupan Kanopi, PlanetScope, NDVI, Penginderaan Jauh.

*UTILIZATION OF MULTITEMPORAL PLANETSCOPE IMAGERY FOR  
MANGROVE DEGRADATION DETECTION THROUGH CANOPY COVER  
IDENTIFICATION: A CASE STUDY IN THE MANGROVE AREA OF WEST BALI  
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**ABSTRACT**

*Mangroves are a group of trees that grow in an area influenced by tidal conditions. Mangrove ecosystem degradation, which is characterized by reduced canopy cover and increased open area within the mangrove forest. This study aims to detect multitemporal mangrove forest degradation through the identification of percent canopy cover using PlanetScope Ortho Analytic 4B SR Level 3B imagery from 2018 - 2024. The analysis was conducted using four vegetation indices including Normalized Difference Vegetation Index (NDVI), Soil Adjusted Vegetation Index (SAVI), Enhanced Vegetation Index (EVI), and Simple Ratio (SR). Determining the condition of mangrove degradation was done by comparing the canopy cover estimation model based on the most optimal vegetation index with field data, and establishing degradation thresholds through the extraction of canopy cover values from degraded mangrove samples.*

*The results showed that NDVI is the most optimal vegetation index to map the percent cover of mangrove canopy in Gilimanuk Bay, with an  $R^2$  value of 0.7048, Standard Error of 7.523, and maximum accuracy reaching 89.665%. Modeling of mangrove canopy cover in 2018-2024 showed an increasing trend, especially since 2021, with the high cover category (87.5-100%) starting to appear in 2022 to 2024. Degradation classification results show that mangrove cover conditions tend to stabilize in the non-degraded class, with the degraded area decreasing from 62 ha (2018) to 13 ha (2022), then slightly increasing to 16 ha (2023-2024), while the non-degraded area continues to increase until it reaches 324 ha in 2024.*

**Keywords:** *Mangrove Degradation, Canopy Cover, PlanetScope, NDVI, Remote Sensing.*