

PEMETAAN KESEHATAN MANGROVE MENGUNAKAN INDIKATOR STRUKTUR HUTAN DI TELUK PANGPANG, KABUPATEN BANYUWANGI DENGAN CITRA WORLDVIEW-2

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INTISARI

Hutan mangrove yang tumbuh di Indonesia termasuk yang paling luas di dunia. Secara ekologis, mangrove berperan signifikan melindungi dan mempertahankan keseimbangan ekosistem pesisir. Akan tetapi, seiring dengan peningkatan aktivitas antropogenik (aktivitas manusia) terdapat beberapa permasalahan di kawasan pesisir yang memicu fenomena degradasi hutan mangrove, seperti alih fungsi lahan. Oleh sebab itu, diperlukan adanya pemantauan kesehatan hutan mangrove untuk menjaga stabilitasnya. Salah satu metode untuk mengetahui persentase kesehatan mangrove adalah menggunakan perhitungan *Mangrove Health Index* (MHI) yang dikorelasikan dengan data citra penginderaan jauh. Penelitian ini dilakukan di Hutan mangrove Teluk Pangpang, Kabupaten Banyuwangi. Lokasi tersebut ditetapkan sebagai Kawasan Ekosistem Esensial (KEE) yang juga mengalami alih fungsi lahan mangrove menjadi tambak. Penelitian ini bertujuan untuk (1) menganalisis parameter MHI, (2) hubungan nilai indeks vegetasi dengan nilai MHI, dan (3) memetakan distribusi kesehatan hutan mangrove Teluk Pangpang, Kabupaten Banyuwangi. Parameter struktur hutan mangrove yang diukur di lapangan berupa persentaseutupan kanopi, diameter tegakan setinggi dada, dan jumlah pancang per luas area dengan total sampel sebanyak 41 plot. Hasil penelitian menunjukkan area kajian penelitian memiliki persentase rata-ratautupan kanopi sebesar 80,74% dengan metode pengukuran *hemispherical photography*. Secara umum, area kajian memiliki persentaseutupan kanopi yang rapat. Rata-rata diameter tegakan sebesar 10,76 cm dengan rata-rata 4 pancang per 16m². Perbedaan rata-rata diameter dan jumlah pancang per luas area dipengaruhi oleh spesies, umur tegakan, dan daerah pertumbuhan mangrove. Indeks vegetasi *Normalized Difference Red-edge Index* (NDRE) atau NDVI *Red-edge* menghasilkan nilai korelasi sebesar 0,386 dan memiliki hubungan yang signifikan dengan MHI. Distribusi spasial MHI termasuk kedalam kategori kesehatan sedang (*moderate*) dengan rata-rata MHI sebesar 59,71% dan distribusi paling banyak berada pada rentang 58,79—61,11%. Pemodelan MHI dengan indeks vegetasi NDRE memiliki nilai *maximum accuracy* sebesar 91,51% dan *standard error* sebesar 5,73%. Secara umum, 433,70 hektar hutan mangrove Teluk Pangpang memiliki kondisi kesehatan mangrove yang baik.

Kata Kunci: Mangrove, Indeks Kesehatan Mangrove (MHI), NDRE, Worldview-2

MANGROVE HEALTH MAPPING USING FOREST STRUCTURE INDICATORS IN PANGPANG BAY, BANYUWANGI DISTRICT WITH WORLDVIEW-2 IMAGERY

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ABSTRACT

Mangrove forests that grow in Indonesia are among the most extensive in the world. Ecologically, mangroves have a significant role in protecting and maintaining the balance of coastal ecosystems. However, along with the increase in anthropogenic activities (human activities) there are several problems in coastal areas that trigger the phenomenon of mangrove forest degradation, such as land conversion. Therefore, it is necessary to monitor the health of mangrove forests to maintain their stability. One method to determine the percentage of mangrove health is to use the calculation of Mangrove Health Index (MHI) correlated with remote sensing image data. This research was conducted in the mangrove forest of Pangpang Bay, Banyuwangi Regency. The location was designated as an Essential Ecosystem Area which also experienced mangrove land conversion into ponds. This study aims to (1) analyze MHI parameters, (2) analyze the relationship between vegetation index values and MHI values, and (3) mapping the distribution of mangrove forest health in Teluk Pangpang, Banyuwangi Regency. The parameters of mangrove forest structure measured in the field are the percentage of canopy cover, diameter at breast height, and the number of saplings every area with a total sample of 41 plots. The results showed that the study area had an average percentage of canopy cover of 80,74% using the hemispherical photography measurement method. In general, the study area has a high percentage of dense canopy cover. The average stand diameter was 10,76 cm with an average of 4 saplings per 16m². Differences in average diameter and number of saplings per area were influenced by species, stand age, and mangrove growth area. The Normalized Difference Red-edge Index (NDRE) or NDVI Red-edge vegetation index produces a correlation value of 0,386 and has a significant relationship with MHI. The spatial distribution of MHI categorite into the moderate health category with an average MHI of 59,71% and the most distribution is in the range of 58,79—61,11%. MHI modeling with NDRE vegetation index has a maximum accuracy value of 91,51% and a standard error of 5,73%. In general, 433,70 hectares of Pangpang Bay mangrove forest are in good health condition.

Keywords: Mangrove, Mangrove Health Index (MHI), NDRE, Worldview-2