

ABSTRAK

Keanekaragaman hayati salah satunya hutan dibutuhkan inventarisasi untuk memberikan informasi kualitas dan kuantitas sumberdaya hutan. Penginderaan jauh sistem aktif (radar) memiliki kemampuan menembus awan perlu dikaji untuk melihat pengaruh sinyal hamburan balik (*backscatter*) khususnya pada tanaman pinus yang belum banyak diketahui. Penelitian ini bertujuan untuk mencari hubungan karakteristik hutan pinus dan *backscatter*, mengetahui kombinasi *band* dan kombinasi polarisasi yang tepat untuk karakterisasi nilai *backscatter* hutan pinus dan melihat perbedaan dimensi pinus yang mempengaruhi nilai *backscatter* citra.

Penelitian ini dilakukan di Malino, Provinsi Sulawesi Selatan dengan menggunakan data citra Sentinel-1A dengan polarisasi VH dan VV dan citra Sentinel 2. Metode yang digunakan yaitu pengolahan citra digital dan pengukuran lapangan. Penelitian ini dilakukan tanggal 11 sampai 19 September 2019.

Hasil pemrosesan citra Sentinel-1A diintegrasikan dengan data lapangan yang berupa data kerapatan, luas tajuk, ketinggian, dan diameter pohon. Integrasi data menggunakan metode analisis korelasi dan diskriminan, guna mendapatkan hubungan maupun nilai *backscatter* dimensi tanaman pinus. Hasil yang diperoleh yaitu hubungan karakteristik hutan pinus dan nilai *backscatter* citra Sentinel-1A dengan menghasilkan *gamma naught* determinasi (R^2) sebesar 0,2 serta nilai koefisien korelasi (r) sebesar 0,44. Polarisasi VH memiliki sensitivitas terhadap tajuk pohon dilihat dari perolehan hasil kalibrasi *gamma naught* VH dengan $R^2=0,40$. Nilai akurasi citra radar sentinel-1A sebesar 66,0% dalam melihat karakteristik hutan pinus berdasarkan nilai *backscatter*nya. Dimensi pinus yang berpengaruh yaitu LAI dengan signifikansi sebesar 0,033 dan korelasi sebesar 0,51.

Kata kunci: Hamburan balik, hutan pinus, dimensi tanaman, Sentinel-1A

ABSTRACT

Biodiversity is one of them an inventory of forests is needed to provide information on the quality and quantity of forest resources. Remote sensing active systems (radar) can penetrate clouds that need to be studied to see the effect of backscatter signals, especially in pine plants that are not widely known. This study aims to explore the relationship between a pine forest and backscatter characteristics, find out the right band combination and polarization combination to characterize the value of pine forest backscatter and see differences in pine dimensions that affect the image backscatter value.

This research was conducted in Malino, South Sulawesi Province using Sentinel-1A image data with VH and VV polarization and Sentinel 2 images. The method used is digital image processing and field measurements. This research was conducted from 11-19 September 2019.

The results of Sentinel-1A image processing are integrated with field data in the form of tree density, crown area, height, and diameter data. Data integration uses correlation and discriminant analysis methods, to obtain the relationship and backscatter value of pine plant dimensions. The results obtained are the relationship between pine forest characteristics and the backscatter value of Sentinel-1A images by producing a gamma naught determination (R^2) of 0.2 and a correlation coefficient (r) of 0.44. VH polarization has a sensitivity to the tree canopy seen from the acquisition of gamma naught VH calibration results with $R^2 = 0.40$. The accuracy value of sentinel-1A radar images is 66.0% in viewing the characteristics of pine forests based on their backscatter values. The dimensions of the pine that influence LAI with a significance of 0.033 and a correlation of 0.51.

Keywords: Backscatter, pine forest, Sentinel-1A