INTISARI

Mixture tuned matched filtering (MTMF) sebagai metode deteksi/klasifikasi berbasis spektral telah digunakan untuk mengektraksi objek jalan dari citra hiperspektral resolusi tinggi. Namun, akurasi metode ini belum diketahui untuk deteksi fraksi jalan aspal pada citra Landsat 8 OLI *path* 127 *row* 61 (*subscene* sebagian Kota Padang) seperti pada penelitian ini. Tujuan penelitian ini adalah: (1)memperoleh pola respon spektral fraksi jalan aspal melalui *manual endmember selection* dari citra Landsat 8 OLI yang telah terkoreksi ke nilai *flat terrain surface reflectance*, (2)mendapatkan akurasi MTMF (*circular error (CE90)*, *sensitivity*, *specificity*) untuk deteksi fraksi jalan aspal pada citra Landsat 8 OLI berdasarkan karakteristik *landscape* (*slope-aspect*-penutup lahan), (3)mengetahui besar pengaruh karakteristik *landscape* tersebut terhadap *sensitivity*. Akurasi MTMF diperoleh melalui uji akurasi deteksi (*sensitivity*, *specificity*) dan uji akurasi posisi (*CE90*) terhadap citra deteksi MTMF terklasifikasi. Besar pengaruh *slope-aspect*-penutup lahan terhadap *sensitivity* diperoleh melalui uji korelasi *dummy variable linear regression*. Hasil penelitian ini yaitu: (1)pola respon spektral jalan aspal dari citra Landsat 8 OLI tinggi pada saluran 1 dan 5, rendah pada saluran 4 dan 7, (2)secara keseluruhan, akurasi *sensitivity* yaitu 67,51% dan *specificity* yaitu 53,02%, sedangkan akurasi posisi *(CE90)* sebesar 45,07 meter. *Sensitivity* dan *specificity* metode MTMF berdasarkan klasifikasi penutup lahan yaitu *impervious* (73,96% dan 35,75%), *soil* (66,01% dan 44,48%), *vegetation* (5,75% dan 92,43%). Berdasarkan *slope-aspect*, *sensitivity* tertinggi pada area S3U (lereng 6-25% arah Utara) yaitu 78,63% dan terendah pada area S3B (lereng 6-25% arah Barat) yaitu 42,5%, sedangkan *specificity* tertinggi pada area S3B yaitu 84,07% dan terendah pada area S1N (datar) yaitu 49,03%, (3)pengaruh *slope-aspect*-penutup lahan terhadap *sensitivity* secara berurutan yaitu angka signifikansi 0,979-0,727-0,001, dengan nilai *r-square* 0,000-0,007-0,397. Kesimpulan penelitian ini adalah: (1)fraksi jalan aspal pada citra Landsat 8 OLI memiliki respon spektral tinggi di saluran 1 dan 5, rendah pada saluran 4 dan 7, namun pola ini tidak bisa dipastikan spektral jalan aspal murni tanpa campuran spektral lainnya, (2)untuk deteksi jalan aspal berdasarkan penutup lahan, *sensitivity* MTMF sangat buruk pada area *vegetation.* Pada area *impervious*, *sensitivity*-nya cukup baik tetapi *specificity*-nya buruk. Akurasi MTMF berdasarkan *slope-aspect* tidak menunjukkan adanya pola yang konsisten. *CE90* sebesar 45,07 meter menunjukkan bahwa akurasi posisi jalan aspal pada citra hasil deteksi MTMF termasuk kelas 2 menurut standar ketelitian geometrik horizontal pada skala 1:100.000, (3)penutup lahan berpengaruh terhadap *sensitivity* (angka signifikansi 0,001<0,05) sebesar 39,7% (*r-square* 0,397), sedangkan *slope* dan *aspect* tidak berpengaruh terhadap *sensitivity* (angka signifikansi 0,979 dan 0,727>0,05).

Kata kunci:*MTMF*(*mixture tuned matched filtering*),jalan aspal,*spectral unmixing*

ABSTRACT

Mixture tuned matched filtering (MTMF) as a detection/ classification method has been used for extracting roads from high-resolution hyperspectral imagery. However, the accuracy of this method has never been recalculated when it is applied to detect asphalt road pixels in the subscene of Landsat 8 OLI imagery path 127 row 61 (part of the city of Padang) as implemented in this study. The objectives of this study are: (1)to obtain the spectral response pattern of the asphalt road pixels using manual endmember selection method from Landsat 8 OLI imagery which has been corrected to the flat terrain surface reflectance value, (2)to calculate MTMF accuracy (circular error (CE90), sensitivity, specificity) in detecting asphalt road pixels on Landsat 8 OLI imagery based on landscape characteristics (slope-aspect-land cover), (3)to quantify the impact magnitude of these landscape characteristics on MTMF detection accuracy (sensitivity). MTMF accuracy is measured by performing detection accuracy tests (sensitivity, specificity) and positional accuracy test (CE90) on classified MTMF detection image. As correlation tests for quantifying the impact of each slope-aspect-land cover to sensitivity, this study used the dummy variable linear regression. The results showed: (1)the spectral response pattern of the asphalt road pixels is high on bands 1 and 5, low on bands 4 and 7, (2)overall, the sensitivity is 67.51% and specificity is 53.02% while the CE90 is 45.07 meter. The sensitivity and the specificity based on each of land cover classification are impervious (73.96% and 35.75%), soil (66.01% and 44.48%), vegetation (5.75% and 92.43%). Based on the slope-aspect classification, the highest sensitivity is in the S3U area (slope 6-25% northward) which is 78.63% and the lowest is in the S3B area (slope 6-25% westward) which is 42.5 %, while the highest specificity is in the S3B area which is 84.07% and the lowest is in the S1N area (flat) which is 49.03%, (3). Correlation test of each slope-aspect-land cover to sensitivity resulted in significance value of 0.979-0.727-0.001 and r-square value of 0.000-0.007-0.397 respectively. The conclusions are: (1)the spectral response pattern of the asphalt road pixels is high on bands 1 and 5, low on bands 4 and 7, still it cannot be ascertained that it is pure spectral of the asphalt roads, (2)for detecting asphalt road pixels in Landsat 8 OLI imagery, the MTMF has very poor sensitivity in vegetation areas. In the impervious area, the MTMF has fairly good sensitivity but poorly at specificity. MTMF accuracy based on slope-aspect classification showed no consistent pattern. CE90 of 45.07 meters at scale of 1: 100,000 belongs to class 2 according to horizontal geometric accuracy standard, (3) the land cover had an impact on sensitivity (significance of 0.001<0.05) by 39.7% (r-square of 0.397), while slope and aspect had no impact on sensitivity (significance of 0.979 and 0.727>0.05).

Keywords: MTMF(*mixture tuned matched filtering*),jalan aspal,*spectral unmixing*