Pemodelan Spasial Deforestasi Di Taman Nasional Kerinci Seblat SPTN Wilayah 1 Kerinci = Spatial Modeling of Deforestation in Kerinci Seblat National Park SPTN Region 1 Kerinci

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Abstrak

Evaluasi dan prediksi perubahan tutupan lahan di Taman Nasional Kerinci Seblat SPTN Wilayah 1 Kerinci memerlukan pengendalian melalui pemodelan perubahan tutupan lahan. Penelitian ini bertujuan untuk menganalisis klasifikasi dan validasi peta tutupan lahan multi-temporal serta memprediksi tutupan lahan tahun 2024, 2029 dan 2034. Pemodelan perubahan tutupan lahan dilakukan menggunakan metode klasifikasi hibrida semi-otomatis yang mengintegrasikan teknik analisis citra berbasis objek dan kemungkinan maksimum pada data Landsat. Teknik pembelajaran mesin, yaitu automata seluler dan jaringan saraf tiruan (CA-ANN) melalui plugin MOLUSCE di QGIS, digunakan untuk memodelkan pola tutupan lahan masa depan. Analisis spasial menunjukkan klasifikasi periode 2015–2024, perubahan tutupan lahan menunjukkan bahwa tubuh air mengalami fluktuasi namun secara keseluruhan meningkat sebesar 1,323%. Hutan lahan kering menurun total sebesar -0,763%, sementara hutan lahan basah meningkat secara bertahap dengan total kenaikan sebesar 0,533%. Perkebunan dan lahan terbuka juga mengalami peningkatan kecil, masing-masing sebesar 0,307% dan 0,005%. Tanaman campuran menurun pada 2015–2019 sebesar -0,082%, tetapi menunjukkan peningkatan kecil sebesar 0,097% pada 2022–2024. Pemodelan spasial perubahan tutupan lahan dari 2024 hingga 2034 cenderung minim. Tubuh air diperkirakan sedikit meningkat 0,02% pada 2024-2029 dan 0,81% pada 2024-2034. Hutan lahan kering mengalami peningkatan kecil 0,07% pada 2024-2029, namun menurun 0,02% pada 2024-2034. Hutan lahan basah diproyeksikan berkurang 1,48% pada 2024-2029 dan kembali ke luas hampir awal dengan perubahan 0,04% pada 2034. Perkebunan, tanaman campuran, dan lahan terbuka menunjukkan peningkatan stabil masing-masing 0,05%, 0,10%, dan 0,24% pada 2024-2034.

.....The evaluation and prediction of land cover changes in Kerinci Seblat National Park SPTN Region 1 Kerinci require control through land cover change modeling. This study aims to analyze the classification and validation of multi-temporal land cover maps and predict land cover for the years 2024, 2029 and 2034. Land cover change modeling is conducted using a semi-automatic hybrid classification method that integrates object-based image analysis and maximum likelihood techniques on Landsat data. Machine learning techniques, namely cellular automata and artificial neural networks (CA-ANN) via the MOLUSCE plugin in QGIS, are used to model future land cover patterns. Spatial analysis of the classification for the period 2015–2024 shows that water bodies experienced fluctuations but overall increased by 1.323%. Dryland forests decreased by a total of -0.763%, while wetland forests gradually increased with a total gain of 0.533%. Plantations and open land also showed small increases, at 0.307% and 0.005%, respectively. Mixed crops decreased by -0.082% during 2015–2019 but showed a small increase of 0.097% during 2022–2024. Spatial modeling of land cover changes from 2024 to 2034 tends to be minimal. Water bodies are expected to slightly increase by 0.02% during 2024-2029 and 0.81% during 2024-2034. Dryland forests will experience a small increase of 0.07% during 2024-2029 but decrease by 0.02% during 2024-2034. Wetland forests are projected to decrease by 1.48% during 2024-2029 and return to nearly the original area

with a 0.04% change in 2034. Plantations, mixed crops, and open land show stable increases of 0.05%, 0.10%, and 0.24%, respectively, from 2024 to 2034.