Spatial Modeling for Critical Land in Universitas Gadjah Mada's Teaching Forest

(*Pemodelan Spasial Kekritisan Lahan di Kawasan Hutan dengan Tujuan Khusus Universitas Gadjah Mada)*

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ABSTRACTS

Mapping of critical land needs to be carried out periodically to provide important information about the spatial distribution of land criticality in forest management. Using models by only updating the data will be more efficient in renewing the map of critical land. The current KHDTK UGM's land and forest rehabilitation blocks are still determined based on existing land cover conditions, not yet consider the criticality of the land. The purpose of this research is to spatially model land criticality that can facilitate the mapping of land criticality, map the spatial distribution of land criticality levels at KHDTK UGM, and quantify the uncertainty of the results of the KHDTK UGM land criticality model. The model was developed using the ArcGis ModelBuilder, referring to P.3/PDASHL/SET/KUM.1/7/2018. The parameters of land criticality used were land cover, slope, and the level of erosion risk, that were determined using the Universal Soil Loss Equation equation. The data used were land cover data of KHDTK UGM year 2020, DEMNAS, CHIRPS precipitation data, and soil type data of KHDTK UGM. The land criticality was modelled in several sub models, namely the rainfall and erosivity, the slope and LS, and the land criticality. With KHDTK UGM data, it was found that the spatial distribution map of KHDTK UGM's land criticality using the model was obtained in 60 seconds. The results show that the spatial distribution of critical land in KHDTK UGM is dominated by the class of slightky critical covering 3,939 ha and the critical class has the smallest area of 535 ha. The critical class is recommended as a priority location for nearest future rehabilitation activities. The uncertainty value from the analysis of KHDTK UGM's criticality land is 16%, where this value were based on the error of the parameters of land cover and slope, which are still quite high, that can be increased use more detailed data.

KEYWORDS
ModelBuilder, USLE, scoring, uncertainty, landcover.

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INTISARI

Pemodelan spasial lahan kritis perlu dilakukan secara berkala untuk memberikan informasi penting tentang distribusi spasial kekritisan lahan dalam pengelolaan hutan. Penggunaan model, dengan hanya memperbarui data, akan lebih efisien dalam pembaharuan peta kekritisan lahan. Hasil pemodelan kekritisan lahan sering kali mengandung ketidakpastian yang perlu dikuantifikasikan. Pertimbangan dalam penyusunan blok model rehabilitasi hutan dan lahan KHDTK UGM masih terbatas pada kondisi penutupan lahan aktual, belum mempertimbangkan tingkat kekritisan lahan. Tujuan penelitian ini membangun model spasial kekritisan lahan, memodelkan sebaran spasial tingkat kekritisan lahan di KHDTK UGM, dan mengkuantifikasi nilai ketidakpastian hasil model kekritisan lahan KHDTK UGM. Model dibangun menggunakan *ModelBuilder ArcGis* mengacu pada P.3/PDASHL/SET/KUM.1/7/2018 untuk penentuan pembobotannya. Parameter kekritisan lahan yang digunakan adalah penutupan lahan, kelerengan, dan tingkat bahaya erosi yang ditentukan menggunakan metode *Universal Soil Loss Equation.* Data yang digunakan dalam penelitian ini yaitu data penutupan lahan KHDTK UGM tahun 2020, DEMNAS, data curah hujan CHIRPS, dan jenis tanah KHDTK UGM. Model kekritisan lahan dibangun dalam beberapa sub model, yaitu sub model curah hujan dan faktor erosivitas, sub model kelerengan dan faktor LS, dan sub modelkekritisan lahan. Berdasarkan data KHDTK UGM, didapatkan bahwa peta peta distribusi spasial kekritisan lahan KHDTK UGM menggunakan model yang dibangun diperoleh dalam waktu 60 detik. Hasil pemodelan menunjukkan bahwa distribusi spasial kekritisan lahan di KHDTK UGM didominasi kelas agak kritis seluas 3.939 ha dan kelas kritis memiliki luasan terkecil seluas 535 ha. Kelas kritis direkomendasikan sebagai prioritas lokasi kegiatan rehabilitasi di periode berikutnya. Ketidakpastian dari kekritisan lahan KHDTK UGM sebesar 16%, yang masih cukup tinggi dan bersumber dari parameter penutupan lahan dan kelerengan.

KATA KUNCI
ModelBuilder, USLE, skoring, ketidakpastian, tutupan lahan