

PEMODELAN VOLUMETRIK TOTAL KARBON DENGAN PENGINTEGRASIAN DATA BOR DAN PENGINDERAAN JAUH PADA LAHAN GAMBUT PESISIR DAERAH PONTIANAK, KALIMANTAN BARAT

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INTISARI

Gambut merupakan material organik yang memiliki kandungan abu kurang dari 55% dan kandungan karbon lebih dari 18%. Lahan gambut merupakan ekosistem rawa tempat terakumulasinya material organik dan memiliki ketebalan gambut minimal 50 cm. Lahan gambut berperan sebagai penyimpan karbon dan memiliki peran penting di ekologi dan lingkungan. Penelitian dilakukan di KHG Sungai Kapuas-Sungai Mandor yang letaknya berbatasan langsung dengan Laut Natuna, sehingga termasuk ke dalam lahan gambut pesisir. Penelitian ini bertujuan untuk mengetahui distribusi dan karakteristik gambut, serta menghitung total karbon tersimpan di daerah penelitian. Data pengeboran dan data penginderaan jauh digunakan dalam penelitian ini. Analisis densitas, kandungan abu, dan komposisi kimia (karbon dan sulfur) digunakan dalam penelitian untuk mengetahui karakteristik gambut yang nantinya akan digunakan dalam karakterisasi tipe gambut. Analisis spasial melalui penginderaan jauh dari data DEMNAS, *drone*, dan Landsat digunakan untuk menganalisis distribusi gambut. Integrasi antara analisis karakteristik gambut dan analisis penginderaan jauh digunakan untuk mengetahui distribusi gambut dan penghitungan total karbon tersimpan. Volume total lahan gambut, densitas, dan kandungan karbon dikalkulasikan untuk mendapatkan total karbon tersimpan. Tipe gambut di lokasi penelitian adalah *hemic* dan *sapric*, dimana *sapric* banyak tersebar di dekat sungai, basal, dan permukaan, sedangkan *hemic* ditemukan di area tengah gambut. Tipe gambut *fibric* tidak ditemukan di area pengeboran, namun dari analisis penginderaan jauh, *fibric* kemungkinan akan ditemukan di kubah gambut. Ketebalan gambut berkisar antara 0,5 – 7 m. Nilai densitas berkisar antara 0,1539 gr/ml – 0,6498 gr/ml dan rata-rata sebesar 0,2924%. Nilai densitas akan semakin rendah seiring dengan pertambahan kedalaman. Kandungan abu berkisar antara berkisar antara 0,077% - 56,382% dan rata-rata sebesar 4,1% (*very low ash*). Kandungan karbon berkisar antara 32,66% - 77,58% dengan rata-rata sebesar 57,5639%. Nilai rata-rata kandungan karbon untuk tipe *hemic* sebesar 57,4246% dan *sapric* sebesar 57,7223%. Kandungan sulfur berkisar antara 0,12% - 1,73% dengan rata-rata sebesar 0,2944%. Nilai rata-rata kandungan sulfur tipe *hemic* sebesar 0,2676% dan *sapric* sebesar 0,3256%. Kandungan karbon akan semakin tinggi ketika menjauhi sungai, bagian basal, dan permukaan lahan gambut, sedangkan kandungan abu dan sulfur akan berkurang ketika semakin jauh dari sungai, basal, dan permukaan. Volume lahan gambut di KHG Sungai Kapuas-Sungai Mandor mencapai 1,299 km³, dengan total karbon mencapai 221,4189 ± 7% MtC.

Kata kunci: distribusi dan karakteristik gambut, lahan gambut, pengeboran gambut, penginderaan jauh, total karbon



VOLUMETRIC MODELLING OF TOTAL CARBON WITH INTEGRATION OF CORE AND REMOTE SENSING DATA IN COASTAL PEATLAND AT PONTIANAK AREA, WEST KALIMANTAN

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ABSTRACT

Peat is an organic material having an ash content of less than 55% and a carbon content of more than 18%. Meanwhile, peatlands are swamp ecosystems where organic material is accumulated and have peat thickness of at least 50 cm. Peatlands act as carbon storage and have an important role in ecology and the environment. The research was conducted in the KHG Sungai Kapuas-Sungai Mandor which is located adjacent to the Natuna Sea, hence it is considered as coastal peatlands. This research aims to determine the distributions and characteristics of peat, as well as to calculate the total carbon stored in the research area. Peat core data and remote sensing data were used in this research. Density analysis, ash content, and chemical composition (carbon and sulfur) were utilized to determine the characteristics of peat which later were used to characterize peat types. Spatial analysis via remote sensing from DEMNAS, drone, and Landsat data was used to analyze the distribution of peat. Integration between peat characteristic analysis and remote sensing analysis is used to determine peat distribution and calculate total stored carbon. The total peatland volume, density and carbon content were calculated to obtain the total carbon stored. The peat types found are hemic and sapric, where sapric is mostly distributed near rivers, basal, and the surface, while hemic is found in the middle area of the peat. The fibric type was not found in the peat coring area. However, from remote sensing analysis, fibric is likely to be found in the peat dome. Peat thickness ranges from 0,5 – 7 m. The density value ranges between 0,1539 gr/ml – 0,6498 gr/ml with an average of 0,2924%. The density value will become lower as the depth increases. The ash content ranges between 0,077% - 56,382% with an average of 4,1% (very low ash). The carbon content ranges between 32,66% - 77,58% with an average of 57,5639%. The average carbon content for hemic is 57,4246% and sapric is 57,7223%. The sulfur content ranges between 0,12% - 1,73% with an average of 0,2944%. The average sulfur content for hemic is 0,2676% and sapric is 0,3256%. The carbon content will be higher the further away from the river, basal, and peatland surface, while the ash and sulfur content will decrease the further away from the river, basal, and peatland surface. The volume of peatland in the KHG Sungai Kapuas-Sungai Mandor is 1,299 km³, with total carbon stored of 221,4189 ± 7% MtC.

Keywords: distributions and characteristics of peat, peatlands, peat core, remote sensing, total carbon

