PERBANDINGAN METODE INTERPOLASI *INVERSE DISTANCE WEIGHTED*, KRIGING, DAN SPLINE KADAR BAHAN ORGANIK TANAH DI LAHAN PERTANIAN PANTAI SAMAS, BANTUL, DIY

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ABSTRAK

Lahan pertanian Pantai Samas, Bantul, DIY memiliki keterbatasan karakteristik dalam hal ketersediaan informasi bahan organik tanah. Informasi tentang sebaran spasial bahan organik tanah sangat penting. Analisis bahan organik tanah di laboratorium memakan waktu yang relatif lama, sehingga penelitian ini memanfaatkan kombinasi analisis laboratorium dengan teknologi penginderaan jauh dan metode interpolasi untuk efisiensi waktu dalam mengetahui sebaran bahan organik tanah. Tujuan penelitian ini, yaitu: 1) mengetahui dan membandingkan tiga metode interpolasi, yaitu *Inverse Distance Weighted* (IDW), Kriging, dan Spline yang paling valid untuk prediksi sebaran bahan organik tanah di lahan pertanian Pantai Samas, Bantul, DIY 2) membandingkan hasil prediksi spasial sebaran bahan organik tanah dengan metode interpolasi IDW, Kriging, dan Spline 3) mengetahui sebaran spasial bahan organik tanah menggunakan metode interpolasi IDW, Kriging, dan Spline. Penentuan titik sampel berdasarkan homogenitas jenis tanahnya melalui *overlay* beberapa data peta. Pengambilan sampel tanah dilakukan pada kedalaman 0-20 cm sebanyak 39 sampel di lahan pertanian Pantai Samas, Bantul, DIY, kemudian melakukan analisis bahan organik tanah menggunakan metode *Walkley and Black* di laboratorium. Hasil analisis laboratorium kadar bahan organik tanah selanjutnya diintegrasikan dengan ketiga metode interpolasi secara *default* pada aplikasi ArcGIS. Hasil uji validasi menggunakan *Root Mean Square Error* (RMSE) menunjukkan IDW memiliki nilai RMSE paling rendah, yaitu sebesar 0,969 dengan luasan prediksi terbesar, yaitu 125,31 hektar atau 49,88% dari total wilayah dan terkecil, yaitu 0,14 hektar atau 0,05%, yang menjadikannya metode yang paling valid untuk prediksi sebaran bahan organik tanah di lahan pertanian Pantai Samas, Bantul, DIY.

Kata Kunci: Bahan organik tanah, IDW, Kriging, lahan pertanian Pantai Samas, penginderaan jauh, RMSE, Spline

COMPARISON OF INTERPOLATION METHODS
INVERSE DISTANCE WEIGHTED, KRIGING, AND SPLINE
CONTENTS OF SOIL ORGANIC MATTER ON
THE COASTAL AGRICULTURAL LAND OF SAMAS, BANTUL, DIY

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ABSTRACT

The coastal agricultural land of Samas, Bantul, DIY has limited information on soil organic matter. Information on the spatial distribution of soil organic matter is very important. Laboratory analysis of soil organic matter takes a relatively long time, so this study utilizes a combination of laboratory analysis with remote sensing technology and interpolation methods to improve the efficiency of determining the spatial distribution of soil organic matter. The objectives of this study are: 1) to identify and compare the three interpolation methods, Inverse Distance Weighted (IDW), Kriging, and Spline, to determine which is the most valid for predicting the spatial distribution of soil organic matter in the coastal agricultural land of Samas, Bantul, DIY; 2) to compare the spatial distribution predictions of soil organic matter using IDW, Kriging, and Spline interpolation methods; and 3) to determine the spatial distribution of soil organic matter using IDW, Kriging, and Spline interpolation methods. Sample points were selected based on soil type homogeneity using map overlays. Soil samples were taken from 39 locations at a depth of 0-20 cm in the coastal agricultural land of Samas, Bantul, DIY. The soil organic matter was analyzed using the Walkley and Black method, and the results were integrated with three interpolation methods in ArcGIS. Validation test results using Root Mean Square Error (RMSE) showed that IDW had the lowest RMSE value of 0.969, with the largest predicted area being 125.31 hectares or 49.88% of the total area, and the smallest being 0.14 hectares or 0.05%. This makes IDW the most valid method for predicting the spatial distribution of soil organic matter in the coastal agricultural land of Samas, Bantul, DIY.

Keywords : IDW, Kriging, remote sensing, RMSE, soil organic matter, Spline, the coastal agricultural land of Samas