

SUMMARY

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Increase population of people who followed by increasing need for people every year, can indirectly lead to landuse changes and global climate changes. Landuse changes and global climate changes can lead to dryness of the land. Droughts can be analyzed with remote sensing and GIS (Geographic Information Systems). This research is to predict spatial distribution of land droughts and its area using remote sensing and GIS technology based on soil moisture. The research was conducted in Tuban, East Java in January 2013 - April 2013.

Method used in this research are surface energy balance and soil moisture from Landsat imagery. Processing of Landsat data has derived several parameters to determining of evapotranspiration and soil moisture. The parameter are albedo, emissivity, and vegetation index (*NDVI*), then transformed into a distribution of input water by added input rainfall data. A land moisture estimation model was created from nonlinier regression analysis between land indices (*NDSI*, *NDVI*, *NDWI*) and soil moisture. Data input of water and soil moisture models were validated by the data of soil moisture measurements in the field and then select the best model to estimate the distribution of land drought.

Estimating the distribution of land drought is analyzed based on validation data from soil moisture imagery with pF 2.5 and pF 4.2. Extrapolation of the data is carried out by Land Unit Map pF, then classified into three classes, namely class dry (exceeds field capacity), humid class (available water content), and wet grade (water saturated).

Results show the permanent wilting point condition is most commonly found in nearly all Tuban district with an area of 109.111 hectares or 78.54% of the total data is mapped. Water condition found in the west area in the district of Tuban regency (Kenduran and Jatirogo) and has an area of 20.861 hectares or 15,02% of the total data that can be mapped. Water saturated conditions are found in the District Plumpang, Widang, and Cross and has extensive 8.951 hectares or by 6,44% of the total data that can be mapped.