

A decision tree based on spatial relationships for predicting hotspots in peatlands

Abstract

Predicting hotspot occurrence as an indicator of forest and land fires is essential in developing an early warning system for fire prevention. This work applied a spatial decision tree algorithm on spatial data of forest fires. The algorithm is the improvement of the conventional decision tree algorithm in which the distance and topological relationships are included to grow up spatial decision trees. Spatial data consist of a target layer and ten explanatory layers representing physical, weather, socio-economic and peatland characteristics in the study area Rokan Hilir District, Indonesia. Target objects are hotspots of 2008 and non-hotspot points. The result is a pruned spatial decision tree with 122 leaves and the accuracy of 71.66%. The spatial tree has produces higher accuracy than the non-spatial trees that were created using the ID3 and C4.5 algorithm. The ID3 decision tree has accuracy of 49.02% while the accuracy of C4.5 decision tree reaches 65.24%.

Keyword: Spatial ID3 algorithm; Spatial relationship; Hotspot; Forest fires; Peatland