

# Application of GIS in Analysis of Vegetation Ecological Indices

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## Abstract

Vegetation ecological indices are useful for understanding the ecological diversity, physical environment, and stand structure of vegetation. This research utilized global positioning system to measure the coordinates of the base points of permanent plots designated in nature reserves. Furthermore, the locations of sample trees within the plots, slope, aspect, and several physical environmental factors of the plots were measured. Geographic information system was applied to establish a geographic database for vegetative resources using field data. The absolute coordinates of plots and sample trees were calculated by using coordinates transformation, and the thematic maps of plots and sample trees were generated automatically from the data. In addition, a vegetation ecological indices analysis model was implemented to derive a number of ecological indices of vegetation, which includes index of dominance, species richness index, index of diversity, evenness index, and important value index (IVI). The results show that GIS is very effective in managing geographic database of vegetation and improving the data quality. Using GIS, the analyst can dynamically select sample plots and rapidly derive various ecological indices of the vegetation. The results of vegetation ecology analysis are useful for understanding the environmental changes and the processes of ecological succession within nature reserves.

**Key words:** geographic information system (GIS), vegetation ecological index,  
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