Remote sensing for evaluation of state and development of Spruce stands condition in the Giant Mountains

Abstract

Monitoring the health status of forest areas using remote sensing methods are still under development. This master thesis focuses on the use of SPOT, Landsat, QuickBird and WorldView-2 images to evaluate condition of spruce stands in Giant Mountains National Park. For these purposes were selected vegetation indices available in the literature.

First satellite images were preprocessed and subsequently calculated vegetation indices. From the generally known were used Normalized Difference Vegetation Index, leaf area index and Simple Ratio. Than were calculated Green Vegetation Index and Red Green Index based on the monitoring of needles color changes. To evaluate moisture conditions were used indices Foliar Moisture Index and wide-band Normalized Differential Infrared Index. The goal was a comparison of the results of these indices and assessment of their applicability. Map outputs indices were compared with maps of defoliation and mortality of coniferous stands by Ing. Milan Stoklasa.

Keywords: remote sensing, Norway Spruce stands, Giant Mountains, vegetation indices, SPOT, Landsat, QuickBird, WorldView-2