

Detecting symptoms of kauri dieback disease by remote sensing. First results based on LiDAR data.

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Kauri trees (*Agathis australis*) are threatened by a fungus like pathogen (*Phytophthora agathidicida*) causing the deadly kauri dieback disease. The aim of this research is to develop a monitoring method based on remote sensing in order to identify individual kauri trees and to detect symptoms of stress in the canopy, such as thinning and yellowing of leaves and bare branches, which can be related to the disease. The study is based on field measurements, airborne LiDAR data, aerial images and satellite data for three areas of the Waitakere Ranges, Auckland. The poster will present the first results of the analysis of LiDAR data and field data collected in summer 2015/2016. In this first step the LiDAR data was used to define tree positions in the form of crown polygons. Based on these polygons, the LiDAR data was further analyzed in order to distinguish kauri from other tree species and to detect and quantify symptoms of stress in the canopy. Initial results show a clear correlation between the canopy health score of the kauri field survey and the point cloud density, height ratios and intensity values of the LiDAR data. In the second step of this research, the spectral characteristics of healthy and stressed kauri trees will be investigated based on field measurements in summer 2016/2017 and satellite data with different spatial and spectral resolutions, including World View 02 and 03 and RapidEye data. Finally the spatial and spectral information will be combined in an object based classification.