M.Sc.-Thesis

NW-FVA
Northwest German
Forest Research Institute

Comparison of different methods for automated canopy gap detection from ALS-based canopy height models

Background:

Canopy gaps are a characteristic structural element of many forests, primarily formed through disturbance events such as storms. They play a central role in forest ecology, as their microclimate differs from that of the stand, which can promote the occurrence of certain plant species.

LiDAR technology (Light Detection and Ranging), especially in the form of Airborne Laser Scanning (ALS), has proven to be an effective tool for capturing and analyzing forest structures. Using ALS data, high-precision canopy height models can be created and canopy gaps can be identified and captured.

Objective of the Thesis:

The aim of the work is to implement different methods for the automated detection of canopy gaps from canopy height models and to compare the mapping results. The different approaches, for example the use of fixed or variable height thresholds, and their suitability for different forest ecosystems or different detection purposes should be evaluated.

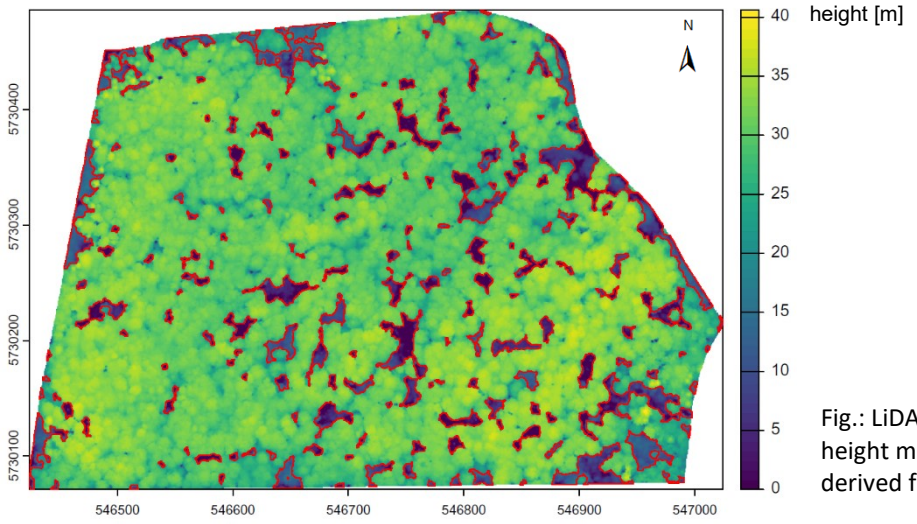

Fig.: LiDAR-based canopy height model and gaps derived from it (red polygons).

Requirements:

- basic knowledge in remote sensing and GIS
- some programming experience (R or Python)

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