

Small-footprint full-waveform airborne LiDAR for habitat assessment in the ChangeHabitats2 project

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Keywords: Airborne laser scanning, habitat monitoring, Natura 2000, Habitat Directive

The Habitats Directive requires the EU member states to report on the status of conservation areas every 6 years. This task requires time- and cost-efficient assessment methods. The ChangeHabitats2 project (CH2) investigates the use of full-waveform LiDAR data to support the reporting. CH2 concentrates on parameters that are difficult to represent by field-measurable indicators or laborious to assess. In this contribution an introduction to CH2 is given. Furthermore, 3 selected applications for the estimation of biodiversity relevant parameters from airborne LiDAR data are presented.

- (1) the automatic determination of grassland types using geometric and radiometric properties of multi-temporal data is introduced.
- (2) a method for direct detection of coarse woody debris (CWD) in forests based on full-waveform observables (e.g. echo width) is presented.
- (3) an approach for mapping linear artificial features (roads, paths and power lines) by classification of topographic and radiometric parameters is described.

Extensive sets of terrestrial reference data collected within CH2 are used for evaluation of the developed approaches. It is shown that reflectance and geometric properties are most useful for determination of grassland types. Direct identification of CWD is possible, but dependent on tree dimension, decay or vegetation density. Joint evaluation of topography and vegetation structure allows identification of linear artificial features, even in overgrown areas.