Integration of laser scanning and hyperspectral imaging for evaluation of Natura 2000 sites - the ChangeHabitats2 project approach

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The European Union pays special attention to the protection of the ecological diversity. The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy that is is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The Natura 2000 sites have to be assessed regularly to acquire information on the state of each site, possible deterioration and countermeasures needed to maintain or achieve its optimal ecological state.

However, the assessment needs extensive resources and field work. The goal of the ChangeHabitats2 project is the development of cost- and time-efficient habitat assessment strategies by combining effective field work techniques with modern airborne remote sensing methods using hyperspectral imagery and laser scanning (LiDAR).

To this end novel field work techniques should be developed that fulfill the reporting requirements of the directive that makes use of the aerial data analysis. Half- or fully-automated methods are about to be developed for the extraction of relevant Natura2000 habitat parameters.

The processing of the LiDAR data includes sophisticated evaluation and classification of the 3D point cloud that enhances the Natura 2000 relevant properties of the analysed area that can be combined with certain hyperspectral results. Besides the recognition of dead wood, some invasive species and 3D structure of the canopy the project also includes the development of powerful, but easy-to-use visualisation techniques of the processed data in order to make available the simplified form of the huge 3D datasets for the ecological specialists for further evaluation.