BOOK OF
ABSTRACTS

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Forest condition assessment – A benchmarking study in Germany

T5.8 Developments in complex remote sensing-assisted forest surveys to support monitoring and assessment of forest ecosystems

Tanja Sanders[1]
Anne Gnilke[1], **Allan Buras**[2], Daniel Doktor[3, 4, 5], Jonas Franke[6], Annett Frick[7], Randolf Klinke[7], Maximilian Lange[3, 4], Frank Thonfeld[8], Torsten Welle[9], Michael Förster[10]
[1] Thünen Institute of Forest Ecosystems, Eberswalde, Germany
[2] Technical University of Munich, Freising, Germany
[3] Department of Remote Sensing, Helmholtz-Centre for Environmental Research - UFZ, Permoserstr. 15, 04318 Leipzig, Germany
[4] Remote Sensing Centre for Earth System Research, RSC4Earth, Talstr. 35, 04103 Leipzig, Germany
[5] German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Puschstr. 4, 04103 Leipzig, Germany
[6] Remote Sensing Solutions GmbH; Munich, Germany
[7] LUP - Luftbild Umwelt Planung GmbH, Potsdam, Germany
[8] German Remote Sensing Data Center (DFD), German Aerospace Center (DLR), 82234 Wessling, Germany
[9] Natural Forest Academy, Lübeck, Germany
[10] Geoinformation in Environmental Planning Lab, Technische Universität Berlin, Berlin, Germany

Abstract: With a continuous assessment of forest condition since the 1980s, Europe takes a keen interest in its forests. It is therefore no surprise that the increasing hot drought frequency and the unprecedented post-2018 forest decline in Central Europe spiked a range of new remotely sensed products to assess its health. They could not be further away from the ground-based assessment of the previous 30 years which aim to directly quantify canopy condition (e.g. percentage of leaf loss), while remotely sensed products provide information on the spectral reflectance which can be considered an indirect measure of canopy condition. However, the information on crown condition is based on the ground assessments of ICP Forests. Therefore, the term might not be ticking the box when presenting remote sensing derived indices. It is thus our aim to define the wording being aware of the differences caused by the change from ground assessment to airborne or spaceborne analysis.

However, the opportunities for high temporal resolution and a gapless spatial cover are fulfilled with a variety of remote sensing products. Here we present a selection of German forest monitoring products derived from satellite-borne remote sensing products, i.e. Sentinel, Landsat and MODIS. The products are compared among each other based on ground-truthed, and thus well-documented changes in forest condition (e.g. defoliation, forest fire, wind-throw). The comparison aims at documentation of the various products, the definition of the methods and terms, as well as the start of a discussion to improve the respective algorithms within a benchmarking process. This process covers two parts: firstly, the presentation and discussion of the currently available products with a focus on the influence of resolution, forest mask, reference year or period, time of detection, and indices used. Secondly, the provision of more detailed information on the specific potentials to map forest disturbance (e.g. storm, forest fires) and the underlying algorithms, discussing aspects of phenological phases, thresholds, and variance.