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## **4Map4Health: Forest Structure Mapping and Tree Species Classification using Laser Scanning Data for Bark Beetle Risk Assessment**

**Yi-Chen Chen**<sup>1</sup>, Markus Hollaus<sup>1</sup>, Sigrid Netherer<sup>2</sup>, Peter Surový<sup>3</sup>, and Juha Hyypä<sup>4</sup>

<sup>1</sup>Department of Geodesy and Geoinformation, TU Wien, Vienna, Austria

<sup>2</sup>Department of Forest and Soil Sciences, University of Natural Resources and Life Sciences, Vienna, Austria

<sup>3</sup>Faculty of Forestry and Wood Sciences, Czech University of Life Science Prague, Prague, Czech Republic

<sup>4</sup>Department of Remote Sensing and Photogrammetry, Finnish Geospatial Research Institute, Masala, Finland

Forests have high economic and ecological importance. Forest fires and insects (bark beetles in particular) are important disturbance agents putting at risk forest health (resilience). Accurate tree structure metrics and species information are important parameters for forest resources and inventory management. Yet, in many cases this information is not available with adequate spatial and temporal resolution.

The 4Map4Health project aims to explore the future multitemporal and multispectral laser scanning data in terms of forest application, especially for mapping of the forest health status, tree species, and forest fire risk. Recent studies indicate that multispectral airborne lidar is a useful and meaningful tool to assess moisture of canopies, which is correlated to forest health and susceptibility to disturbance. By means of multitemporal remote sensing data and machine learning, tree species information at individual tree level will be retrieved. During 2021 and Silvilaser 2021 benchmark event, laser scanning data from various platforms, as well as in situ data, have been collected at one of the test sites in eastern Austria. The preliminary outcomes show the high potential for deriving various forest structure parameters valuable for bark beetle risk assessment in addition to topographic and meteorological parameters. Furthermore, first tests show the high potential of ALS data as reference to train various regression models for the assessment of forest structural parameters from Sentinel-1 time series data with high temporal resolution, which can serve as essential input data within a bark beetle risk assessment framework.