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EUFODOS: European Forest Downstream Services – Improved Information on Forest Structure and Damage

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Abstract. Forests play a key role in the European economy and environment. This role incorporates ecological functions which can be affected by the occurrence of insect infestations, forest fire, heavy snowfall or windfall events. Local or Regional Authorities (LRAs) thus require detailed information on the degradation status of their forests to be able to take appropriate measures for their forest management plans. In the EUFODOS project, state-of-the-art satellite and laser scanning technologies are used to provide forest authorities with cost-effective and comprehensive information on forest structure and damage. One of the six test sites is located in the Austrian province of Styria where regional forest authorities have expressed a strong need for detailed forest parameters in protective forest. As airborne laser-scanning data is available, it will be utilized to derive detailed forest parameters such as the upper forest border line, tree height, growth classes, forest density, vertical structure or volume. At the current project status, the results of (i) the forest border line, (ii) the segmentation of forest stands and (iii) the tree top detection are available and presented including accuracy assessment and interim results are shown for timber volume estimations. The final results show that the forest border can be mapped operationally with an overall accuracy of almost 99% from LiDAR data. For the segmentation of forest stands, a comparison of the automatically derived result with visual-manual delineation showed in general a more detailed segmentation result, but for all visual-manual segments a congruence of 87% within a 4 m buffer. Tree top detections were compared to stem numbers estimated based on angle-count samplings in a field campaign, which led to a correlation coefficient (R) of 0.79.

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