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Supporting pre-fire planning and canopy fuel parameters estimation employing a forest information system and remote sensing data

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Up to the present, in the German federal state of Rhineland-Palatinate, forest fires are no principal threat for woodland. In 2008 only 15 fires with about 1.3 ha burned area occurred. But this might alter taking the conditions of climate change into consideration, which is expected to lead to longer and more frequent dry periods. For the drought period in 2003, the recent JRC report (JRC 2009) lists three times more forest fires than in 2008 for the entire area of Germany. Additionally, the future risk situation may get modified by changing management practices, e.g. close to nature and sophisticated forest concepts or in contrast the allocations for private wood use on public estates. While climate change will particularly have an effect on fuel wetness conditions, management practices will influence spatial fuel abundance and vertical forest structure to a greater extent.
In respect to these alterations, information about the available forest fire fuel is of rising interest and fire spreading models are demanding detailed input data. In this study, realized within the EC funded Interreg IVB project ForeStClim, the possibility of using area comprehensive forest information system data (WöFIS) as an input of forest fire models (FARSITE) has been evaluated for Norway spruce forest units in a low mountain natural space. Forest information system data has been tested for the possibility to be calibrated with high resolution LIDAR data. A correlation analysis showed good results for the relationship between WöFIS tree age and LIDAR tree height. A correlation coefficient of 0.89 (R^2=0.8) proves the eligibility to derive tree height from tree age for Norway spruce trees. The validation proved the utility to derive tree height from WöFIS data tree age with a correlation coefficient of 0.9 and a small bias lower than 1 m of underestimation tree height. The results are promising to accomplish further studies for heterogeneous forest units with various tree species.