



OROGRAPHIC INFLUENCE ON STORM DAMAGE TO FORESTS IN MOUNTAIN AREAS BY THE EXAMPLE OF WINDSTORM 'LOTHAR'

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The extraordinary strong storm 'LOTHAR' on December 26, 1999 caused large damage in the forests of France, Switzerland and Germany. In Germany, specially the Black Forest (Schwarzwald) was concerned. In this contribution an empirical analysis of storm damage in the northern Black Forest is given. The aim is to derive the orographical influence on the windfield from the damage pattern. This is recorded approx. 5 months after the disaster by an airborne survey with a digital line scanner. From these data highly resolved, georeferenced distributions of the vegetation index are calculated (2 m x 2 m pixel size). The damaged forest areas appear with a lower vegetation index than areas with intact vegetation. Demarcation between damaged forest areas and populated or differently used areas is given by a landuse model. Mapping of the storm damages and their combination with a digital elevation model and landuse data is performed in a GIS. It is shown that the damage pattern is significantly affected by orographic factors. Large damage occurred e.g. at the location of saddles between single mountains, on mountain flanks facing to the North and Northwest, and at the windward (west) flanks of extended mountain ridges. Little damage is found in areas that presumably were protected against the wind, i.e. on the leeside (eastern) mountain flanks, in dells and niches as well as in valleys perpendicular to the mean west to southwest winds.

To explain the spatially complex distribution of damages more fully, an analysis is made where characteristics of the forest and of the soil are taken into account. The knowledge gained can be profitable for future afforestation in mountain areas to stabilize forests against severe storms.