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MAPPING THE RISK OF FOREST WIND DAMAGE USING AIRBORNE LASER SCANNING

BACKGROUND AND OBJECTIVE

- National Land Survey of Finland (NLS) started collecting ALS-data in 2008 to provide new national elevation model
 - The data is available at free of charge
 - This data set has great potential and wide variety of possible applications in spatial modeling
- The objective of this study was to test the feasibility of ALS-data from NLS in mapping the risk of forest wind damage

MATERIAL AND METHODS

- The study area covered approximately 178 km² of mainly managed boreal forests and agricultural fields
- The damages occurred during the winter storms on 26th and 27th of December 2011
- The used ALS data were acquired in 2008
- High resolution aerial imagery acquired after the damage were used for providing the ground truth data
- Systematic grid (16 m x 16 m) was established and 400 sample grid cells were selected systematically and classified as damaged or undamaged
- Spatial factors explaining the damage probability were investigated using multivariate logistic regression model
- The predictors for risk model were extracted from the ALS-derived surface models:
 - Canopy Height Model
 - Digital Terrain Model

RESULTS AND DISCUSSION

- The strongest predictors in the risk model were mean height of vegetation, canopy cover and elevation.
- Risk model based on ALS data provided a good agreement on detected damage areas.

0 0.5 1 km

Damage probability

0 2 4 km

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