The detection of windfall and windbreaks in the Norway spruce stands using GEOBIA, LiDAR and aerial photo based 3D point clouds – a case study in Koscieliska Valley (Tatra National Park, Poland)

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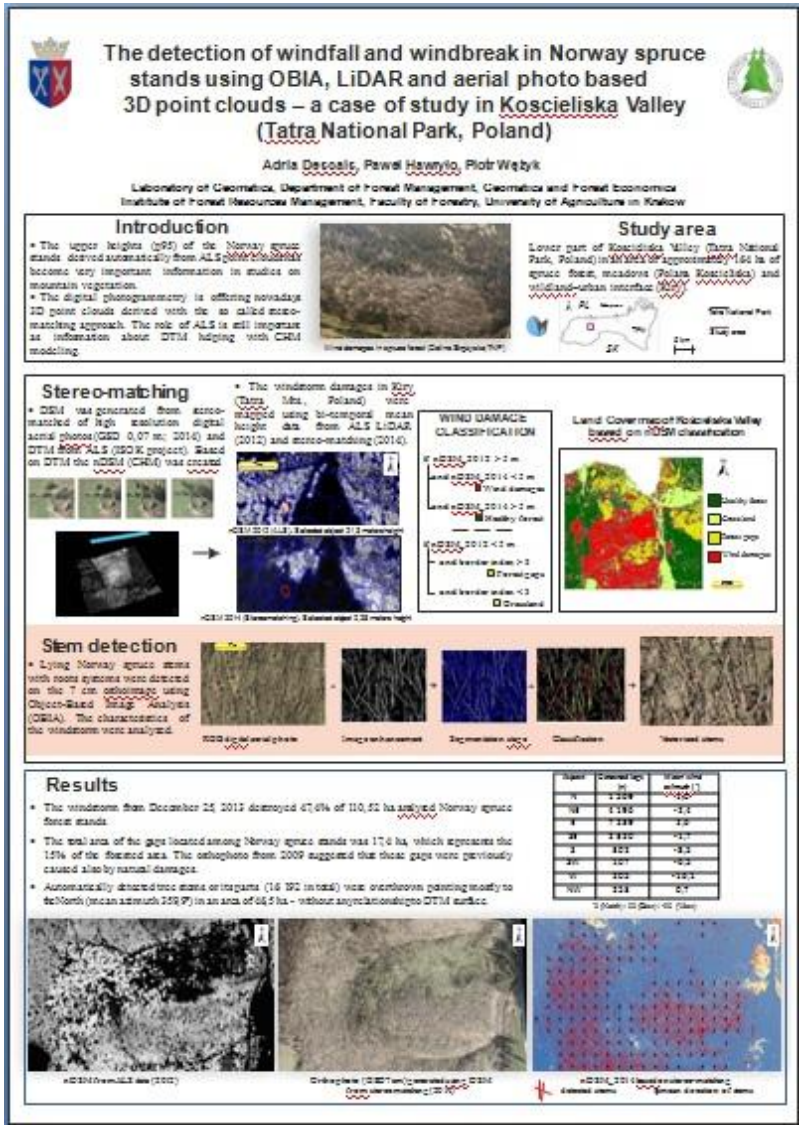
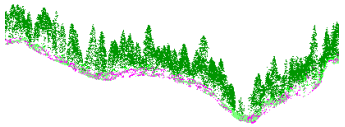
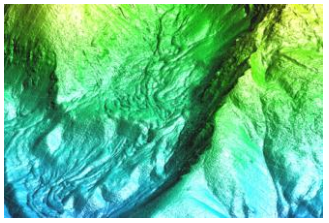
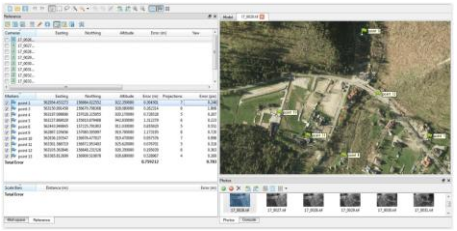


Windstorms in Polish Tatra at Dec. 25, 2013

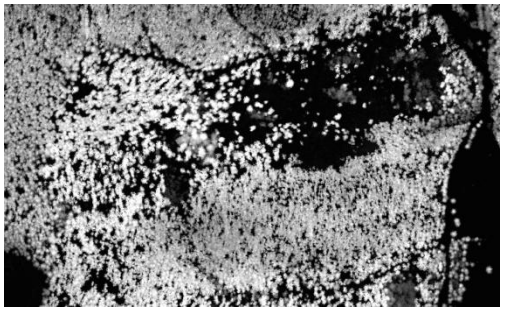


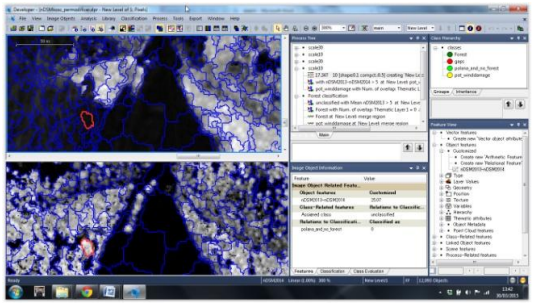


ALS LiDAR data from 2012



AGISOFT PhotoScan software – 3D point clouds - DSM





nDSM based on stereomatching and GEOBIA approach

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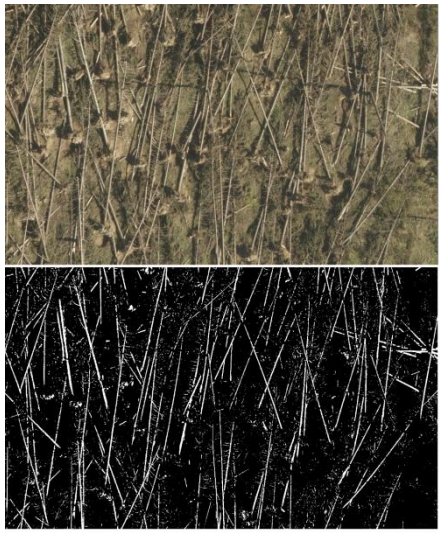
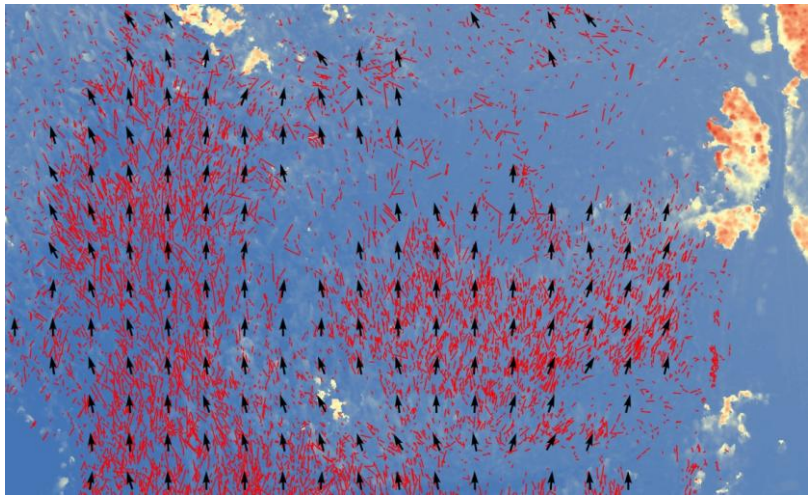


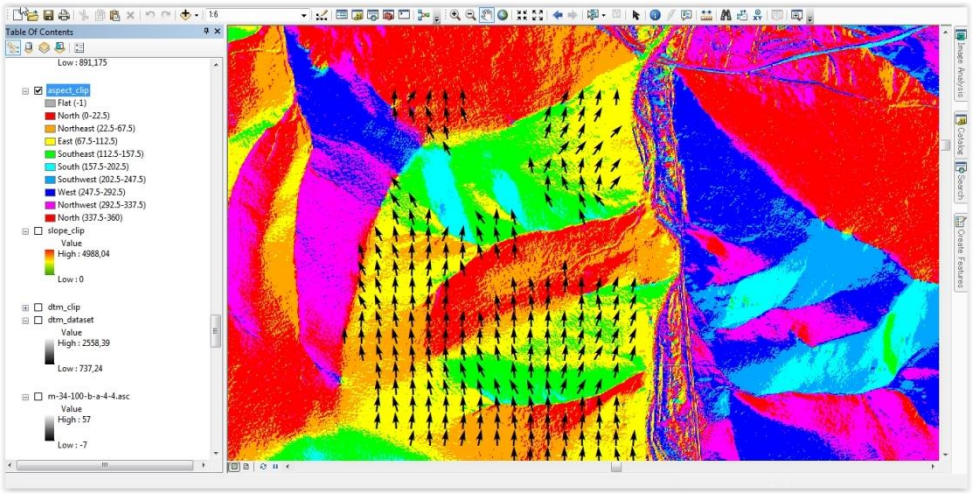
Enhancing of the 7 cm aerial orthophoto.

Automatically vectorizied stems

Image enlargment



Results: Red - stems / black arrows - wind directions



wind direction over the aspect map