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LoggingMap – concept for better planning of logging trail network in rough terrain conditions

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Planning of logging trail network is one of key tasks of harvester operator while utilizing CTL-method in thinning conditions. The Layout of the logging trail network defines the overall productivity potential for whole harvester-forwarder unit. While creating the logging trail network the harvester operator must obey the trafficability restrictions of forwarder and avoid setting the trail in place where it is too steep or the bearing capacity of the ground is poor. For planning process the operator can utilize electronic maps installed into on-board computer of forest machine. Basically the only difference between modern electronic on-board maps and conventional paper maps is the real time position and route based on GNSS. On Conventional maps the elevation levels of terrain are illustrated by contour lines and the skill to perceive the terrain conditions depends on operators personal abilities. LoggingMap concept was created to ease the operator´s planning process by visualizing the terrain conditions in more detail and illustratively than conventional maps.
LoggingMap consists multiple layers derived from LIDAR based DEM, CHM and other stand characteristics. The most important layers for logging trail planning are elevation, slope, shaded relief, precise contour lines, basal area and required thinning intensity. DEM offers possibility to create 3D model of terrain and to create real 3D map of logging site.
The initial technology demonstrations were carried out in late 2010 and early 2011. The first operational field test were organized in November 2012 and January 2013 on three different thinning sites. LoggingMap was installed into separate laptop next to harvester’s on-board computer for data comparison purposes. Two operators had opportunity to use both map devices simultaneously for whole stand and to compare new layers of LoggingMap and conventional electronic maps. The Overall conclusion was that the LoggingMap and new layers would ease the logging trail planning process and improve work safety in rough terrain conditions while the visibility is poor.