



Time scaling of tree rings cell production in Siberia

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It is assumed that an annual tree-ring growth is adequately determined by a linear function of local or regional precipitation and temperature with a set of coefficients that are temporally invariant. But often that relations are non-linear. The process-based tree-ring VS-model can be used to resolve the critical processes linking climate variables to tree-ring formation.

This work describes a new block of VS-model which allows to estimate a cell production in tree rings and transfer it into time scale based on the simulated integral growth rates of the model. In the algorithm of time identification for cell production we used a integral growth rates simulated by the VS-model for each growing season. The obtained detailed approach with a calculation of the time of each cell formation improves significantly the date accuracy of new cell formation in growing season. As a result for each cell in the tree-ring we estimate the temporal moment of the cell production corresponded to the seasonal growth rate in the same time scale. The approach was applied and tested for the cell measurements obtained for Scots pine (*Pinus sylvestris*) for the period 1964-2013 in Malaya Minusa river (Khakassia, South Siberia).

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