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Micro-site specific growth deviations and climate sensitivity of a Fennoscandian pine tree-ring network

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The boreal forest represents an important archive for climate reconstructions over the past centuries to millennia. In this ecosystem tree growth is primarily controlled by summer temperatures and sub-fossil trees are preserved in shallow lakes, allowing a prolongation of living tree chronologies up to millennial scale. It is known that micro-environmental growth conditions of the underlying samples should be homogenous when compiling such chronologies. The influence of changing micro-site conditions on tree-ring width (TRW) chronologies was, however, not yet systematically investigated on a larger spatial scale. Here we present a comprehensive Pinus sylvestris tree-ring width network covering the entire Fennoscandia. At 20 locations, we sampled trees at locally moist and dry sites, resulting in 40 micro-site chronologies. Considering the networks' wide geographical range and the connected climatic gradients (latitudinal temperature gradients and longitudinal luv-lee effects of the Scandinavian Mountains) our study aims at: i) Evaluating larger scale inter-site relationships of the micro-site network, ii) analyzing micro-site specific growth performance and iii) micro-site specific climate sensitivity over space and time. Our findings will help to estimate the importance of considering potential micro-site effects within larger scale tree-ring networks that might eventually help to improve the development of climate reconstructions from this annually resolved archive.