



Drought reconstructed from oak (*Quercus* spp.) ring width chronology for the Czech Lands, AD 1040–2015

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We present main results of spring–summer drought reconstruction for the territory of the Czech Republic (CR) spanning the last millennium. Drought is represented by the Standardized Precipitation Evapotranspiration Index (SPEI). Well replicated chronology of oak (*Quercus* spp.) tree-ring width (TRW) measurements since AD 1040 was employed as a proxy. In order to preserve high- and low-frequency signal and compare the effect of age removal method on final TRW index (TRWI) series, we tested several methods of standardization. Standardized TRW indices were calibrated to SPEI values calculated from instrumental measurements and covering most of the 19th and the 20th centuries. Linear regression with subsequent variance scaling was used for calibration in different time intervals covering mostly second part of the 19th and the first part of the 20th centuries. Due to a significant loss of coherency between target and TRWI during the second part of the 20th century, this period was excluded from calibration/verification trials. Reconstruction results were the best for April – May period, for which TRWI and target data shared 36% of common variability. Response function was verified on independent TRWI and target data. New millennium-long drought reconstruction is characterized with a large inter-annual and inter-decadal variability with no long-term trends, the picture that confirms our knowledge on drought variability from the instrumental period. There can be identified two relatively long periods covering approximately the 13th–14th centuries and the period from the 1630s to the 1850s with lower drought variability. The occurrence of extremely wet/dry years was rather rare during these periods. The driest (1447–1477) and the wettest (1134–1163) 30-year periods occurred in the pre-instrumental part of the new reconstruction.