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Climate signal inδ^{18}O, δ^{2}H, δ^{13}C and tree-ring widths of *Larix decidua* growing at SE European Alps (Slovenia)

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We present the first chronologies (AD 1907-2006) of stable oxygen (δ^{18}O), hydrogen (δ^{2}H) and carbon (δ^{13}C) isotope composition of Larix decidua tree-rings, growing at the forest limit in the SE corner of the European Alps. Climate in June appears to have the strongest control on tree ring width (TRW), while later summer conditions (July-August) influence the stable isotope composition. All four proxies are strongly correlated with temperature and also sunshine hours, but precipitation has less impact. Our results suggest that trees growing at this site have an adequate water supply and that their growth is limited mainly by temperature and sunshine hours. A combination of TRW and δ^{13}C provides the greatest potential for reconstructing past temperatures (June to August) with significant ($p<0.001$) correlations with gridded temperatures extending across a very large part of Southern and Western Europe west of the Carpathians. The water isotopes record conditions in the Adriatic and Mediterranean, to the S and SE of the field sites, which is the source area for moist air masses that bring precipitation to this region, giving strong correlations with temperatures in southern Italy and the western part of the Baltic Peninsula. Combining proxies with different spatial and temporal signals allows the strength and spatial footprint of climate signals to be enhanced. These findings provide a basis for further work on climate reconstruction in the area of SE Alps and Western Balkans.