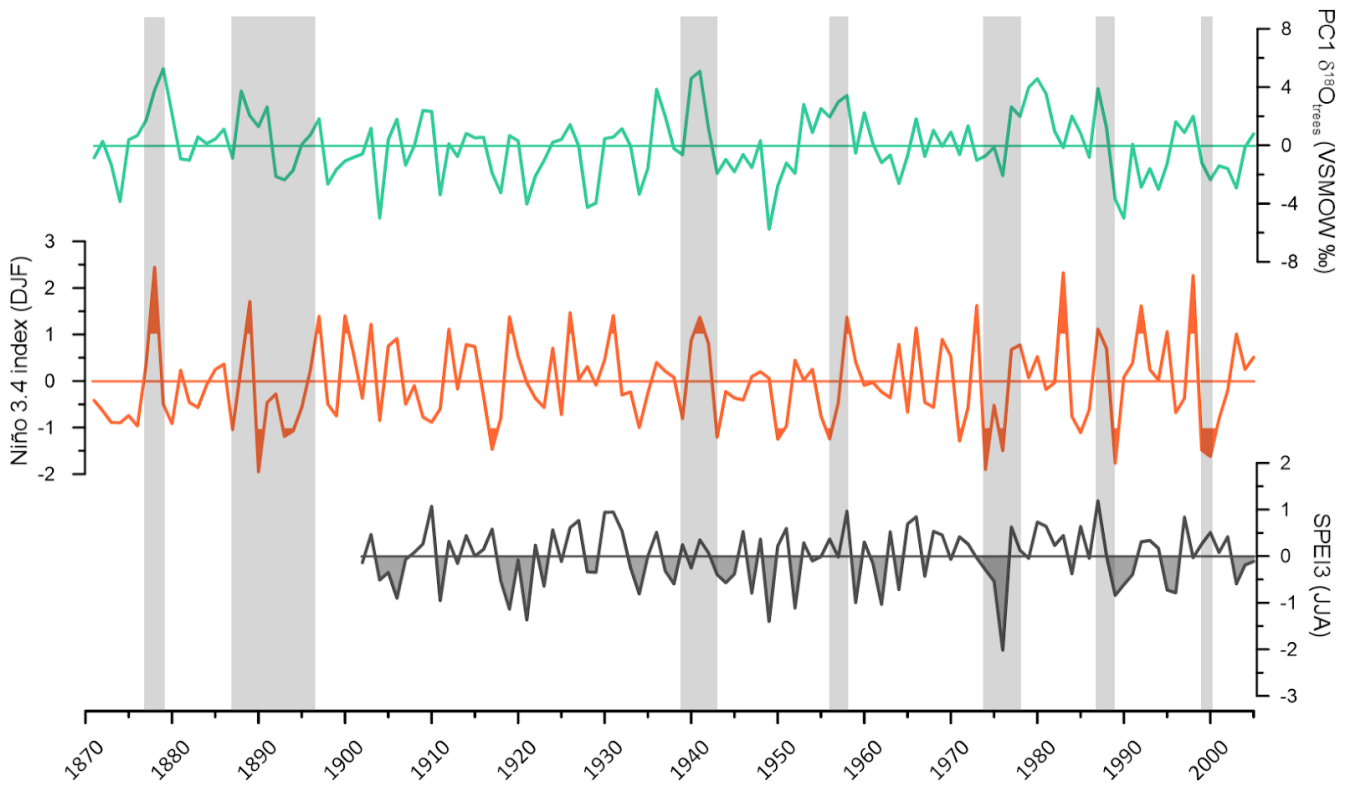
Supplement 1: The density function of PC1 with two additional functions for El Niño and La Niña years. The El Niño and La Niña years have been extracted out of a Nino 3.4 DJF index (HadISST1; Rayner et al. 2003) for the period from 1870 to 2000.

5

Supplement 2: The time series of the first component of the stable oxygen isotope network in comparison to other time series of climate patterns. For a better comparison, a Nino 3.4 index for DJF (HadISST1; Rayner et al. 2003) and a SPEI3 drought index (SPEIbase v.2.5 [SPEI3]; Longitude -5° to 10°/Latitude 46° to 52°) are shown. Selected El Niño and La Niña events are highlighted via a grey background.

10