**Supplemental Material**

Chart, scatter chart

Description automatically generated

S1. Bomb-pulse 14C standardization. a. black dots: individual 14C samples given in per mil 14C. red line: Northeast Pacific average. green line: latitude-corrected 14C average. blue line: upwelling-corrected 14C average. Curves based on Helser et al., 2014. b. black dots: residuals of measured 14C from latitude-corrected curve (green line in panel a). blue line: annual, weighted mean of residuals.

Chart, box and whisker chart

Description automatically generated

S2. Correlations between 3-year averaged basin-scale indices and Tree Nob 14C. Monthly indices are averaged over three years to meet the temporal resolution of 14C. Significance and confidence intervals bootstrapped in TreeClim at p < 0.01. Significant correlations are shown in black, non-significant in grey. Annual correlations given to right of plots and considered significant at p < .05.