**SUPPLEMENTAL MATERIAL**

**Figure Captions**

**Supplemental Figure 1. N**umber of tree-ring series per year over the period of record (3996 yrs). The very low numbers after 2000 are an artifact of sampling and do not reflect abundance of stems on the ground. Most of the field sampling was done prior to 2001; in 2013 a subsample of live trees was conducted to bring the chronology up-to-date.

**Supplemental Figure 2**. Wavelet analysis of limber pine ring-widths from the Wassuk Range, showing power in the range of 500—1000 yrs (approach of Gray et al., 2003). Black lines encircle frequencies with significant power (99% confidence intervals; warm colors).

**Supplemental Figure 3.** Mid-range frequency indicesand radial growth plotted for the instrumental period, 1890—2013 CE. **A.** Cumulative water deficit (CWD); data from Lorraine Flint, USGS, 2017 for the Wassuk Range in the areas of limber pine samples. **B**. Values of the Atlantic Multidecadal Oscillation (AMO); standardized data from Kaplan et al., 1998. For A. and B. the orange curve is the cubic spline fit at lambda = 1,000; the green line is the linear fit, and the red line is the mean of values. **C.** Wassuk Range limber pine ring-width plot, with annual growth smoothed by a spline with lambda = 10 (blue line).

**References**

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