

**Site name:** Khorgo Lava Pine, Mongolia

**Collectors:** A. Hessler, N. Pederson, Kevin Anchukaitis, John Burkhart, Oyunsanaa Byambasuren, Baatarbileg Nachin, Byarbaatar Soronzonbold, and Balginnyam Ulziibayar,

**Lat/long:** 48.167 N, 99.867 E

**Elevation:** 2077 m

**Species:** PISI – *Pinus siberica*

**References:** Pederson, N., A.E. Hessler, B. Nachin, and K.J. Anchukaitis. Accepted. Pluvials, droughts, the Mongol Empire, and modern Mongolia. Proceedings of the National Academy of Science.

**Metadata comments:**

Cores and cross-sections from living and dead Siberian pine were collected in 2010 and 2012 across the Khorgo lava field near Tariat, Mongolia. The trees were collected from soils that were either thin or absent soils surrounded by dark basalt.

Forty-four percent or more of these trees had some form of strip-bark. This morphology can enhance short and long-term trends in tree ring widths as growth is focused to the living portion of strip-bark trees. In fact, we find that strip-bark Siberian pine on the Khorgo lava field had positive ring widths over the first 150-300 years of ring-width formation while non strip-bark Siberian pine showed the common decline over the first 150-300 years of ring-width formation (Pederson, Hessler, et al., 2014; PNAS). Not removing these trends can cause long-term trends in the final tree-ring chronology from these trees that might not reflect climatic trends. Please see Pederson, Hessler, et al. (2014) for further discussion of the issue with this collection.

As of February 2014, we are only sure of the dating of this record back to about 750 CE. These data are likely correctly dated further back in time, but in this setting Siberian pine experiences occasional missing rings and produces some false rings that look very real. Our experience indicates that we need 10-20 Siberian trees in these settings to ensure we have captured all false or missing rings. For this reason, users of this data set should not use the data

prior to that date. Also, we cut off this record at 900 CE because tree replication might limit recovery of 'true' climatic variation. We used all these series in this data set to recover as much long-term variation during standardization from 900 CE to the present.