Supplementary Fig. 1) Linear regression of the logit-transformed annual Chukchi Sea ice cover (%) versus the satellite-era (1979 – 2016) Chukchi Sea ice index. This index was created using data from the three core locations used to generate the ~4000 year dinocyst-based Chukchi Sea ice index.

Supplementary Fig. 2) Results of the resampling test of the sensitivity of walrus bone collagen δ13C and δ15N comparisons to incorrect ice state assignments. Left panel shows means calculated from original high (right, blue circle) and low (left, red diamond) assignments overlaid on means calculated from the resampling output. Error bars indicate ± 1 standard deviation. Right panel shows a closer view, without the error bars, to show the distribution of the means calculated from the resampling output.