



CLIMATE-OCEAN ISOTOPIC SIGNALS FROM LATE JURASSIC-EARLY CRETACEOUS (VOLGIAN-HAUTERIVIAN) SUBPOLAR BELEMNITES, WESTERN SIBERIA

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Our understanding of Cretaceous climate and environments has been hampered by the lack of data from high latitudes. This study presents new isotopic data from a late Jurassic-early Cretaceous (Volgian-Hauterivian) interval from the Yatria River, sub-polar Urals, Western Siberia. The succession consists of 70 m of highly fossiliferous silty claystones. These were deposited, during the early Cretaceous, on the southern margin of a large boreal epicontinental marine embayment at a palaeolatitude of 60-65 degrees N. Oxygen and carbon isotopic compositions have been determined from well preserved belemnite genera *Lagonibelus* sp., *Cylindroteuthis* sp. and *Acroteuthis* sp. The estimated temperatures reveal a shift to cooler temperatures from Late Volgian times through into the Late Valanginian. Some warmer phases are clearly recognised in the earliest Berriasian and the earliest Valanginian. Carbon isotopes display a pattern of relatively stable values across the Jurassic-Cretaceous boundary, followed by a rapid excursion to more positive values in the Valanginian (equivalent to the Campylotoxus zone), which subsequently return to pre-excursion values in the earliest Hauterivian. Surprisingly, these most positive carbon isotope values correspond with the most positive oxygen isotope values (and hence coldest palaeotemperatures) and a period characterised by inferred eustatic sea level fall. In conjunction with identified increases in both glendonites and dropstones for these times, the data support the possibility of limited polar ice during the early Cretaceous. Coincidental falls of sea level imparts further confidence that these events were of a magnitude to effect the Earth as

a whole.