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Supraregional correlation across the western Arctic Ocean: Towards an improved Quaternary stratigraphy and its paleoenvironmental implications

MICHAEL SCHRECK¹, SEUNG-IL NAM¹, GEE SOO KONG², JENS MATTHIESSEN³, CHRISTOPH VOGT⁴, RÜDIGER STEIN³
AND FRANK NIESSEN³

¹Arctic Research Centre, Korea Polar Research Institute, 26 Songdomirae-ro, 21990 Incheon, Korea

²Petroleum and Marine Research Division, Korea Institute of Geoscience and Mineral Resources, 34132 Daejeon, Korea

³Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Am Alten Hafen 26, 27568 Bremerhaven, Germany

⁴Geoscience Department, University of Bremen, Klagenfurter Straße, 28334 Bremen, Germany

Constraints on the temporal occurrence and spatial extent of Amerasian ice sheets are prerequisite for understanding the boundary conditions necessary for the ice sheet build up in the western Arctic. Although an especially extensive western Arctic marine ice sheet complex has been proposed for Marine isotope stage (MIS) 6, stratigraphic constraints from the Chukchi Borderland are rare, and even missing from the East Siberian continental margin, as most glaciogenic features have not been reliably dated by sediment core data and stratigraphic correlation yet. Thus, the timing of (repeated) glaciations and/or ice advances in the Beringian region is still a matter of debate.

Readily visible (dark) brown layers are a widespread feature in Late Quaternary sediments of the Central Arctic Ocean, and have been considered potentially useful stratigraphic marker beds for core correlation. Their formation, however, is still a matter of debate but it has been recently suggested that warmer interglacial/ interstadial conditions with a more active hydrological cycle led to formation of these Mn-rich dark brown layers. Here we present new data set from a suite of high-quality sediment cores that are aligned in two transects across the Chukchi Plateau (East - West) and Mendeleev Ridge (South- North), respectively. Using continuous high-resolution XRF scanning, colour reflectance, and physical properties data allows characterizing the dark brown layers in more detail and to improve their application for stratigraphic correlations. The proposed a supra-regional stratigraphic correlation scheme is integrating both the western Arctic basins and ridges, and will ultimately help to establish a reliable chronology for glacial activities in the Amerasian basin.

