**Statement of contribution**

With our manuscript “Serpentine ice channels and their interaction with riverbed permafrost in the Lena River Delta, Russia” we advance the understanding of the impact of river ice on the sub-river thermal sediment properties. We present observations along river channel cross sections of 1) remote sensing images, 2) geoelectrical surveys, and 3) numerical thermal modelling experiments and show that using remote sensing we are able to map deep channels in the Lena River Delta (so-called serpentine ice) that are characterized by unfrozen riverbed sediment. This method can also be used to map areas which are prone to a drastic change of the ice regime, triggering either formation new permafrost or thaw of existing permafrost beneath the riverbed.

Our results provide essential new information for the hydrological routing of the winter under-ice water flow. Furthermore, mapped deep channels can be a valuable addition for navigational charts in poorly mapped regions.