

# Ancient permafrost of the Batagay megaslump (E Siberia) – first insights into chronostratigraphy

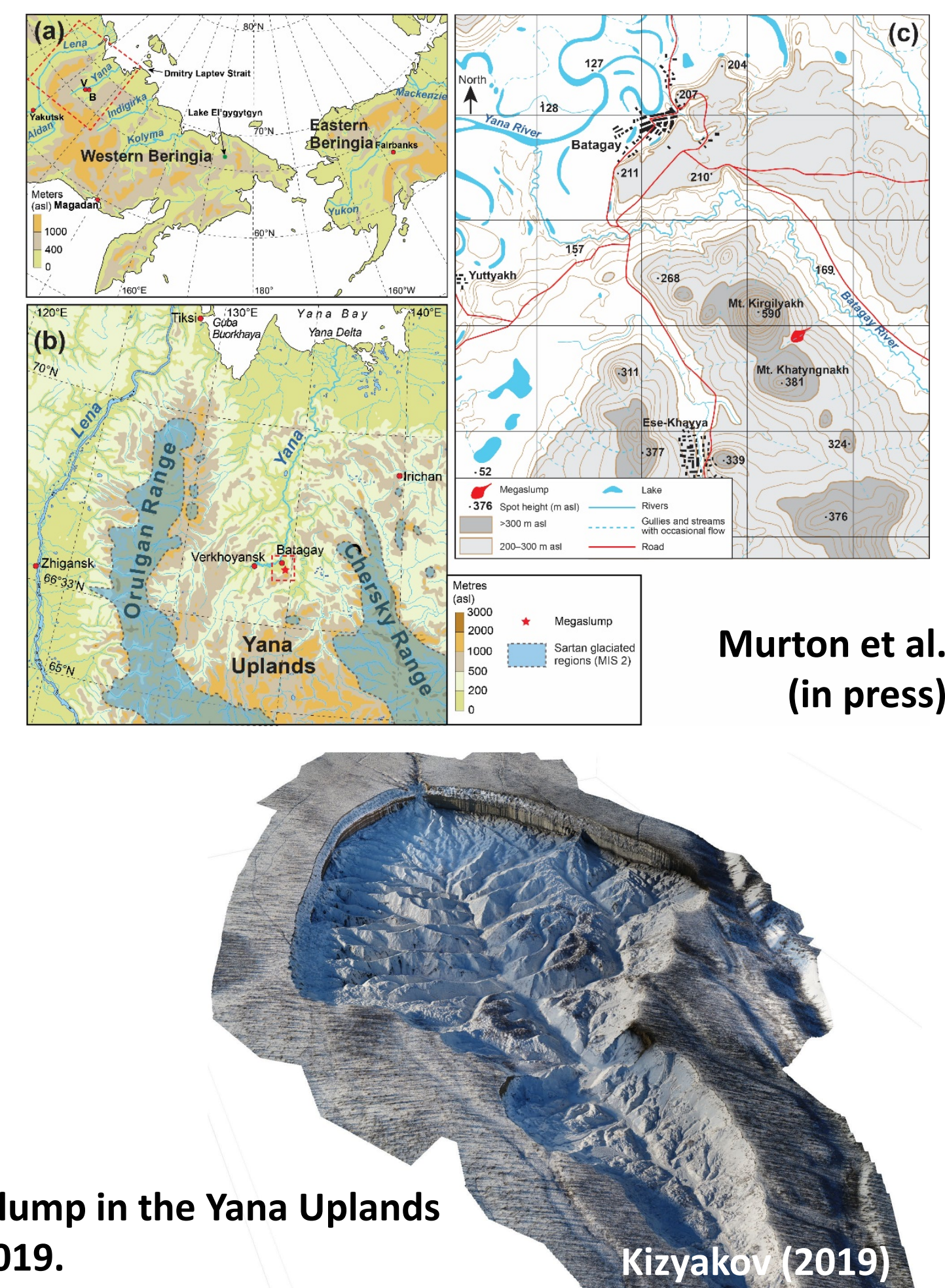
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## INTRODUCTION

The world's largest permafrost thaw feature – the Batagay Megaslump – exposes ancient permafrost at the > 50 m high headwall pre-dating the Last Interglacial. Here, four generations of ice and sand–ice (composite) wedges that formed synchronously with permafrost aggradation are distinguished.

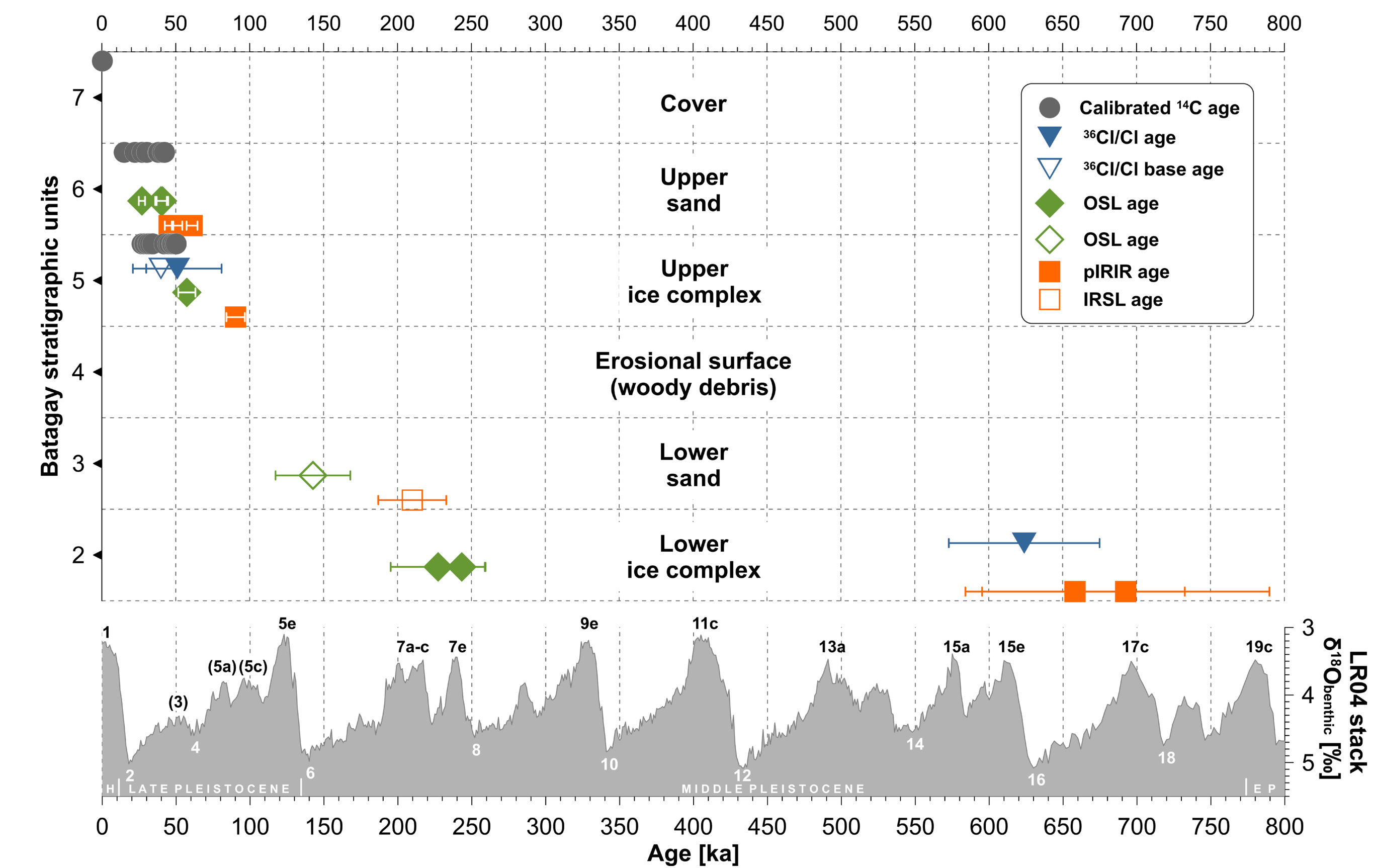
Fig. 1: Study site Batagay megaslump in the Yana Uplands and drone imagery from April 2019.



## RESULTS

All four chronometers produce stratigraphically consistent and comparable ages. Those span discontinuously from MIS 16 (or older) for the lowermost exposed ice complex to modern at surface.

Fig. 3: Schematic overview of all available chronostratigraphic data of the Batagay megaslump (Murton et al. in press).



## METHODS

We applied various dating methods to all relevant stratigraphic units in comparison where appropriate:

- (1) Radiocarbon on organic remains;
- (2) Luminescence on quartz (OSL) and K-feldspar (iIRIR);
- (3) Chlorine-36 on wedge ice.



Fig. 2: Headwall of the Batagay megaslump.

## DISCUSSION AND CONCLUSIONS

The Batagay permafrost sequence potentially provides one of the longest terrestrial records of Pleistocene environments in western Beringia. The lower ice complex represents the oldest dated permafrost in western Beringia that survived multiple Interglacials. Future dating is needed to corroborate pilot results presented here.

## REFERENCE

Murton et al. (in press). A multi-method dating study of ancient permafrost, Batagay megaslump, East Siberia. *Quaternary Research*, doi:10.1017/qua.2021.27