

Field work report for the Karelian cosmogenic dating campaign 2015 (August 16th to 30th)

The research carried out during the field trip in NW Russia between August 16th and 30th 2015 was focused on identifying and sampling boulders suitable for surface exposure dating and deposited along the Last Glacial Maximum limit. Our team was composed this year by: Dr Shelekhova from the Karelian Institute of Geology, Russia, Dr Syarki and Ms Mjasnikova (PhD candidate) from the Northern Water Problems Institute Karelian Research Centre, Russia, Dr Zaretskaya from the Geological Institute in Moscow, Russia, Mr Gorchach (PhD candidate), Dr Hang from the University of Tartu, Estonia, and myself from the University of St Andrews, UK. Strong from our previous experience in the field accumulated over the previous two summers in northern Russia, our team has collected a total of 20 rock samples between Pudozh and Vologda (Figure 1).

We have actually expanded our initial scope of research in three ways. First, we have sampled boulders from a full sequence of moraines spanning the retreat pathway of the Scandinavian Ice Sheet, following a broadly SSE-NNW transect. In this respect we will be able to build a continuous and direct chronology of the last retreat of the SIS margin in this region where no chronological control on the dynamics of the last ice sheet exists.

Second, we sampled boulders outside the limit of what is considered to be the Last Glacial Maximum extent. With our results we will be able to validate or invalidate the currently acknowledged position of the maximum extent of the ice sheet margin. If our surface exposure ages are older (Saalian for example, >130 kyr) than the LGM (~19 kyr for the global LGM) this will validate the current position of the LGM ice margin. If our surface exposure ages are younger than the LGM, this will mean that the LGM ice margin went further out than the currently “approved” ice extent during the LGM.

Third, we recorded and mapped potential lakes for future coring expedition during the winter months. Suitability was identified with respect to proximity to well-defined ice marginal belts, easy access to lake shore with coring device, possibility to correlate future sediment data records with cosmogenic dating.

The rock samples for cosmogenic dating will be processed in St Andrews for the dry steps of the sample preparation procedure. The samples will then be further prepared and then analyzed by accelerator mass spectrometry at the CEREGE, France. Results are expected by the end of next year.

Based on previous experience further west in Europe and on a recently published papers with data from the nearby countries (Finland, Lithuania, Belarus, Poland), we are confident that the chronology will be of high quality and that the objectives of the project will be fulfilled.

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