Siberian Traps expanded in space and composition through new high precision geochronology

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Enormous volumes of volcanic rocks produced during the main pulse of the Siberian Traps large igneous province were emplaced within <1 m.y, coincident with the end Permian extinction event. Additional volumes of volcanic and subvolcanic rocks from Taimyr and West Siberia adjacent to the Siberian Traps in East Siberia have been correlated based on similar chemo- and volcanostratigraphies, and geochronology showing overlap at the 5-6 m.y. precision level. Younger ages have been interpreted to indicate prolonged magmatism to the north of the Siberian Platform. We report the first high precision U-Pb (CA-ID-TIMS) zircon geochronological data from felsic rocks of the Dumtalei and Dikarabigai layered mafic to felsic intrusions from Taimyr, showing that these layered intrusions crystallised synchronously with the main pulse of the Siberian Traps. This is the first documentation of felsic magmatism coinciding with the main Siberian Traps magmatic pulse, thus extending the footprint of the Siberian magmatic event. The layered intrusions cut the lower basaltic flows of the >3 km lava stratigraphy in Taimyr and put tight age constraints on the onset of volcanism in Taimyr. The overlap in age of subvolcanic and volcanic activity between Taimyr and the Siberian Traps indicates that the total area of the main pulse of the Siberian Traps should include the ca. 300 000 km^2 area between Norilsk and the Taimyr fold belt, and as such this increased volume should be taken into account when considering the overall impact of the province on the global environment. This work was supported by the Russian Science Foundation, grant No. 14-37-00030 and RFBR (projects 18-05-00234 and 18-05-70073).