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Past environmental changes and volcanic activity in the south-central highlands of Iceland

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This project aims to shed light on explosive volcanic activity and environmental dynamics in the southern central highlands of Iceland. The project relies on tephrostratigraphy and –chronology involving the documentation of core stratigraphy as well as sampling and chemical analysis of tephra layers supplemented with radiocarbon dating and pollen analysis for environmental reconstruction.

Here, we focus on a 205 cm long sediment core from Lake Arnarfellsvatn located south of the Múlajökull glacier, a southern outlet of the Hofsjökull ice cap. At present, the lake receives meltwater from Innri-Múlakvísl River, which drains Múlajökull, through a side channel. The lake core record extends back to ∼4200 cal. yr BP determined by the presence of the Hekla 4 tephra marker at the bottom of the core. Minerogenic sediments entered the lake at about 3800 cal. yr BP , which we tentatively interpret as the onset of the Neoglaciation in Central Iceland, and organic-rich sediments reappeared before ∼1300 cal. yr BP.

Tephra from 16 explosive eruptions have been identified in the lake sediments and preliminary results based on geochemistry indicate that tephra from the source volcanic systems Hekla, Katla, Bárðarbunga and Grímsvötn are present. All tephras except those originating from Hekla are basaltic.