# The preboreal retreat of the Iceland Ice Sheet (IIS) and Neoglacial landscape destabilization in the Central Highlands, West Iceland

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Terrestrial records from lake cores are essential for linking the influence of the oceanic, atmospheric, and land processes that bring abrupt climate changes observed throughout the late Holocene in Iceland[2,3]. Iceland's lakes provide unparalleled records of Holocene climate variability due to their high sedimentation rates and abundant tephras, which allow for high-resolution records with robust age models.

An 8 m-long core was obtained from Arnarvatn Stóra, Central Highlands, West Iceland (540 m. a.sl.) in March of 2015. Deglacial silt in the bottom 2 cm of the core is overlain by the Saksunarvatn tephra (∼10.3 kyr BP), indicating the retreat of the Iceland Ice Sheet (IIS) from this area during or shortly after the Pre-Boreal period, contrary to previously estimated ice extent maps for this time period[5].

Physical and biological proxies from the cores indicate three major periods of landscape evolution during the Holocene: ca. 10-6 ka, a period of landscape stability and andesol formation[1] probably due to extensive vegetation cover; ca. 6-4 ka, a time of increased explosive volcanism (indicated by tephras in the core) with subsequent landscape destabilization; and ca. 4-0 ka, a time of intense and increasing soil erosion,[1] changing in-situ biological activity, and landscape destabilization representing Neoglacial cooling[4] following the decrease in Northern Hemisphere summer insolation. First order Neoglacial destabilization trends culminate for all biological proxies at the peak of the Little Ice Age (LIA), about 200 yr BP. This 3-phase pattern of landscape evolution, including LIA peak destabilization, is similarly noted in cores from the proglacial lake Hvítarvatn (HVT), east of Lanjökull. However, the HVT record does not extend beyond the Saksunarvatn tephra.[3] Future work with this core will include age-model improvement using microprobe anaysis of tephra layers and synchronization with other Iceland lake and marine records.

## References:

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