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Hydrographic measurements in Jökulsárlón lagoon, Iceland

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Jökulsárlón is an enclosed lake on the south west coast of Iceland. It borders the retreating Breidamerkurjökull glacier which flows down from the Vatnajökull icecap. The lake is bordered on the north by a fjord where the glacier meets the ocean. In 1989, a large portion of this glacier broke off and calved in the fjord. Since 1989 the lake has grown and become shallower. Hydrographic work in the 1970’s showed the deepest regions of the lake to be 150 m and had salinities of only 18 dS/m.  Salts were used to model the lake and to understand the water balance and exchange with the ocean. However in the absence of modern hydrographic data from the lagoon these studies have used data from Harris (1976) for their calculations.

The lagoon was formed in the 1930’s as the glacier retreated, and since formation, the surface area has increased linearly from ~5 km² in 1960, to ~15 km² in 1999. It is a proglacial lake on the south west coast of Iceland. In April 2012 we conducted four hydrographic sections to determine the early season hydrographic structure of the Jökulsárlón lagoon. The inflow to the lagoon is in discrete pulses. The warmest and coldest water in Jökulsárlón lagoon were adjacent to the Breiðamerkurjökull glacier.

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The synoptic CTD Stations show the hydrographic structure across the lagoon. Away from the ice face advection-diffusion dominates. The data here show that saline water enters the lagoon every day. The warmest and coldest water in Jökulsárlón lagoon were adjacent to the Breiðamerkurjökull glacier.

References


2 The inflow to the lagoon is in discrete pulses

4 Away from the ice face advection-diffusion dominates

6 The warmest and coldest water in Jökulsárlón lagoon were adjacent to the Breiðamerkurjökull glacier

Close to Breiðamerkurjökull glacier the contribution from melting ice is clear.