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A Temporal Study of the Proglacial Lakes Surrounding Múlajökull Outlet Glacier, Iceland Between 1987 and 2021.

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Proglacial lakes often form due to the availability of meltwater at a glacier margin. The greatest increase in proglacial lake area and volume is currently occurring in the Arctic. This research quantified the annual change and seasonal variations in proglacial lake area and colour of Múlajökull outlet glacier southeast Hofsjökull. The Normalised Difference Water Index is used to calculate the annual and seasonal area of proglacial lakes between 1987 and 2021 in Google Earth Engine. As the terminus of Múlajökull has retreated, the number and area of proglacial lakes has increased. This has been most noticeable after the year 2000 following which, the glacier terminus retreated up to 400m. Results from this study have shown a retreat of Múlajökull terminus caused increase in area of proglacial lakes. Between 1987 and 2021 an increase in proglacial lake area from 0.16 km² to 1.27 km² was observed and the glacier terminus retreated by 700m. In addition to this, spatial and temporal variation of proglacial colour was observed between 1987 and 2021. The results of this study will provide greater insight into the annual and seasonal changes in the proglacial lake area and colour of Múlajökull outlet glacier.