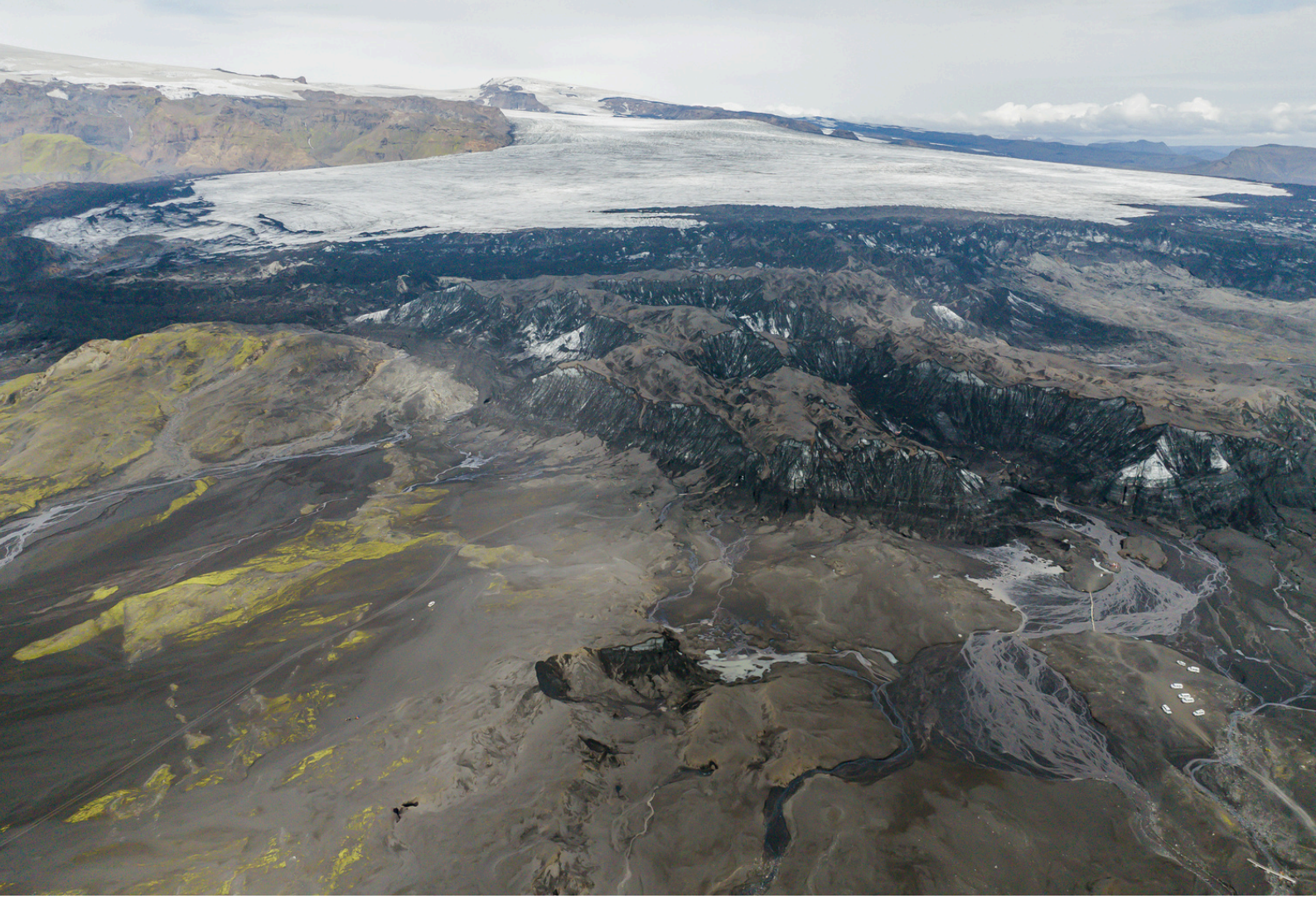

MONITORING REPORT

KÖTLUJÖKULL OUTLET GLACIER AND HÖFÐAFJARA BEACH

Report for measurements done on
10th of July, 2025 by

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Kötlujökull outlet glacier

Kötlujökull outlet glacier originates from the eastern side of Mýrdalsjökull Ice Cap, which is mainly confined on top of and within the caldera of Katla volcano. Ice from the south-eastern part of the Katla caldera supplies Kötlujökull, where it passes through a breach in the caldera between the peaks of Hábunga and Kötlukollar. After that the outlet glacier spreads and comes down to the lowland between the mountains Sandfell and Hafursey. The glacier is about 13-15 km long and originates at about 1200 m. a.s.l. and terminates at about 200 m. a.s.l.
Kötlujökull was formerly known as Höfðabrekkujökull but is now almost exclusively called Kötlujökull and the Höfðabrekkujökull name is now used for a large deposit of sand and gravel that formed southeast of the farm of Höfðabrekka in the glacial outburst floods from Katla in 1721 and 1755. Like most glaciers in Iceland, Kötlujökull has retreated extensively in recent years, and the glacier snout is usually very dark due to sediments in the ice. The glacier is perhaps best known for the fact that most jökulhlaup that have come from Katla and Mýrdalsjökull glacier in the last 1100 years have passed through the glacier. The glacier is also known for its beautiful ice caves and the beautiful landscape near the glacial snout.

Objectives of Monitoring Kötlujökull outlet glacier

The objective of the monitoring program of Katla outlet glacier is to document the retreat rate of the glacier by doing biannual measurements of the entire glacial snout. The measurements are carried out by using two GTS-6 TopCon GPS devices with accuracy of ±5 mm. One is used as a base station and the other for measurements.

Along with measuring, photos and drone photos are taken of the glacier itself and the environment in front of it. Those photos will then be used to monitor the environmental changes in front of a retreating glacier. The aerial photographs taken with a drone are used to map out parts of the glacier that were inaccessible during measurements.

Another objective is to map out the dead ice field in front of the glacial snout. The reason for the measurements is to increase the understanding of the evolution of a dead ice field in front of a rapidly retreating outlet glacier and to map out the large-scale environmental impact of the long-term melting of the dead ice in the field.

Field work on the 10th of July 2025

On the 10th of July 2025, a field measurement was carried out on Kötlujökull outlet glacier and at Höfðafjara beach, south of Hjörleifhöfði.

The measurements at Kötlujökull involved both measurements of the south-western part of the glacial snout and the western part of the dead ice field. The measurements at Höfðafjara beach consisted of one profile, profile 12, which was being measured for the first time. The results of the field work can be seen on the figures below. On figure 1-3, the measurements and the drawn lines of ice and dead ice from the drone aerial photographs can be seen. Due to summer melt, the bottom part of the glacial snout was covered in sediments and multiple small streams running from the glacier due to melting. This made it hard to carry out measurements of the glacier itself. The dead ice field was easily accessible, with no stream on the western side interfering with measurements.

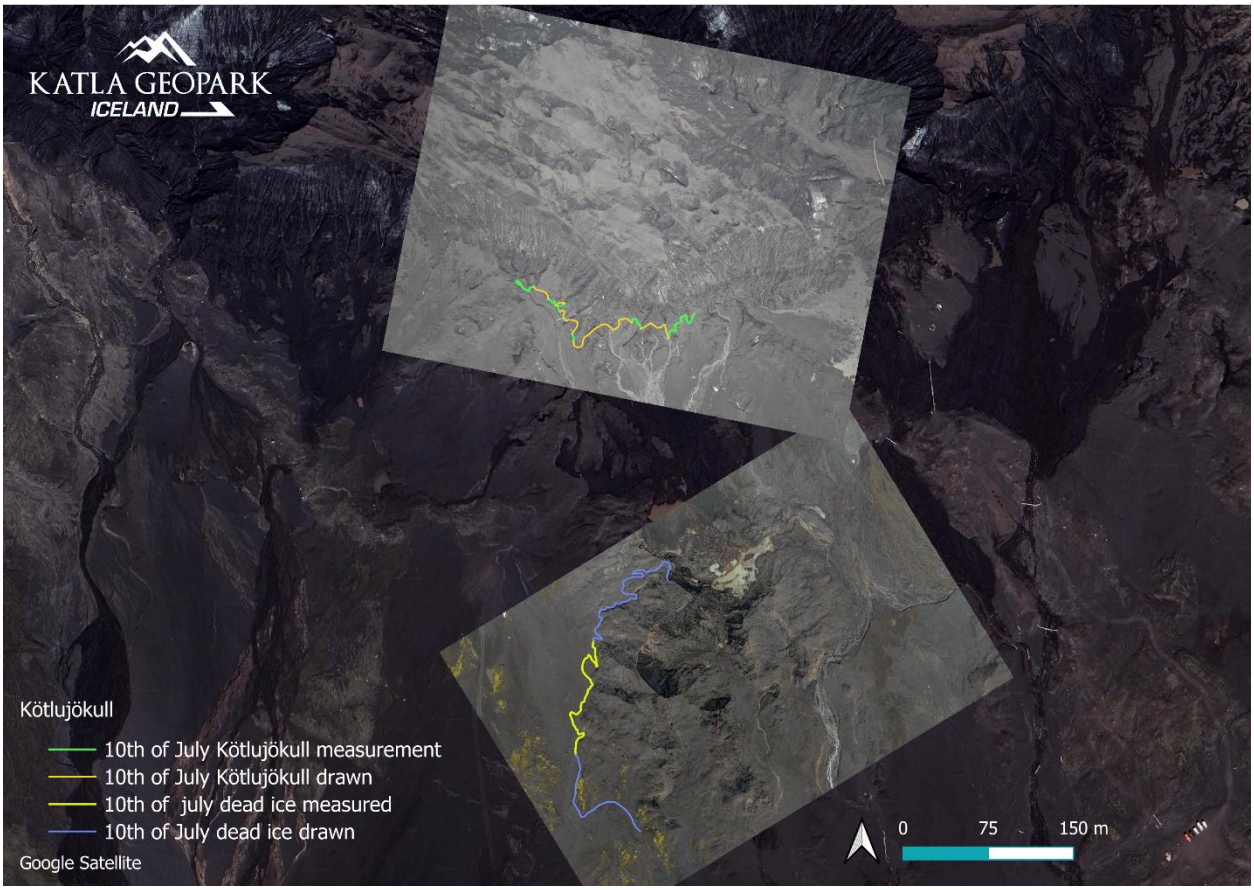

Figure 1. The measured lines of the glacial snout of Kötlujökull and the dead ice field in front of it.

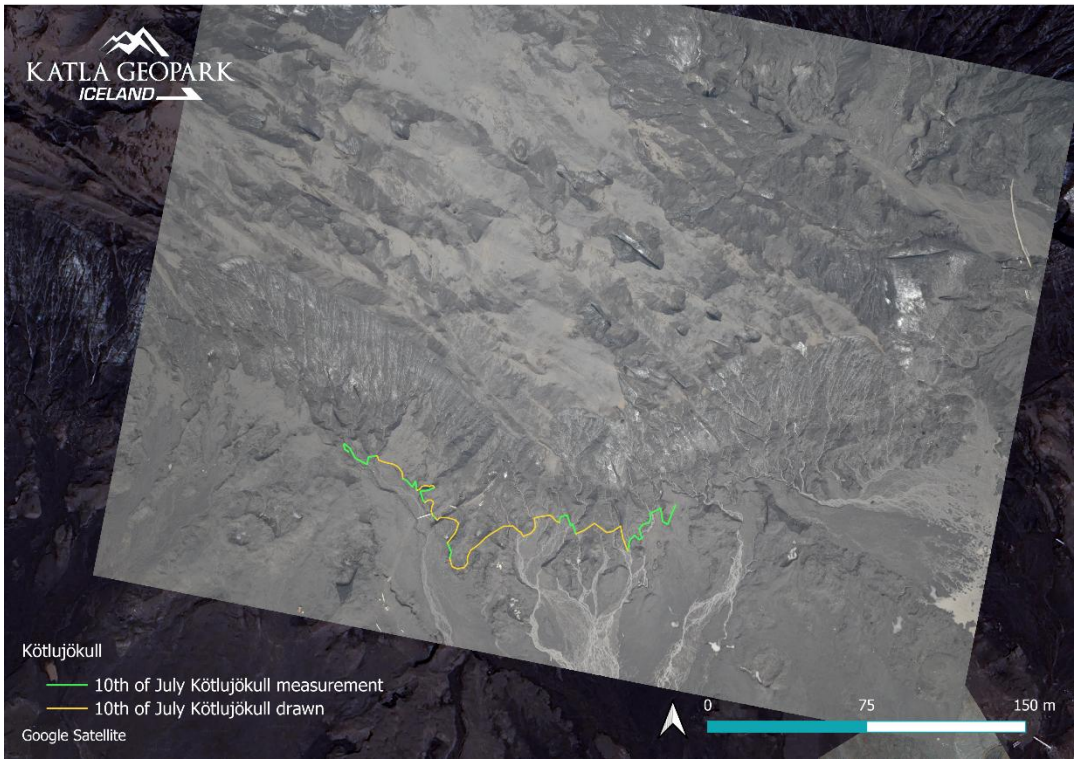

Figure 2 shows the measured and drawn lines of the glacial snout.

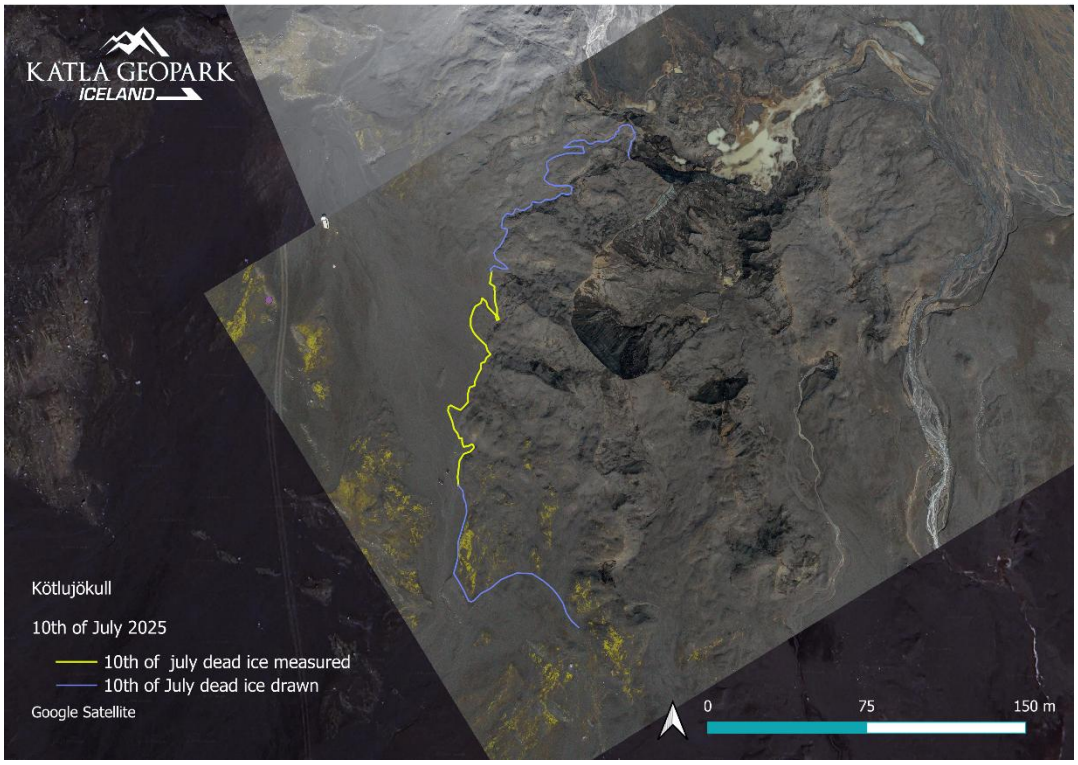

Figure 3 shows the measured and drawn lines of the dead ice field.

The measurements at Höfðafjara beach involved the measurement of a new beach profile there, named profile 12. This profile is on the most southern part of the Kötlutangi protrusion and was established to monitor the coastal erosion that is going on there since its formation during the 1918 eruption of Katla volcano. A few hours after the start of the eruption, a large glacial outburst flood came down from Kötlujökull glacier and it covered large parts of Mýrdalssandur plain. Large portion of the flood entered the ocean on either side of Hjörleifshöfði and deposited its sediments there, building up the protrusion of Kötlutangi. This resulted in about 3 km long protrusion being created, which then started to be eroded back in the days following. Since then, the protrusion has been receding and is now almost back to its pre 1918 location. With the first measurement of profile 12, it will serve as a baseline for future measurements of the profile and is the first results of the morphology of the coastline there. The location of the profile can be seen on figures 4-5 and the results of the measurement on figure 6.

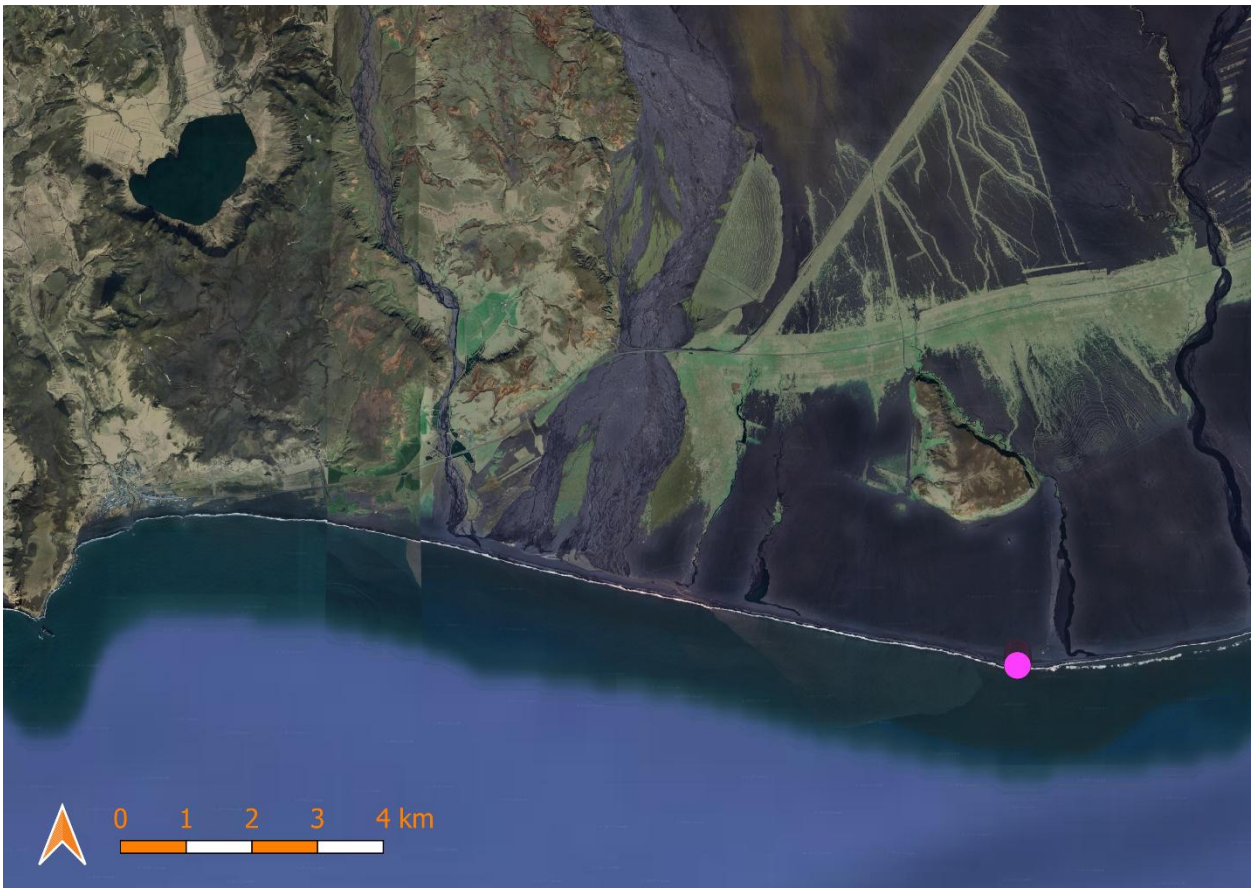

Figure 4 shows the location of Höfðafjara and profile 12. The Kötlutangi protrusion is south of the mountain of Hjörleifshöfði and east of the town of Vík.

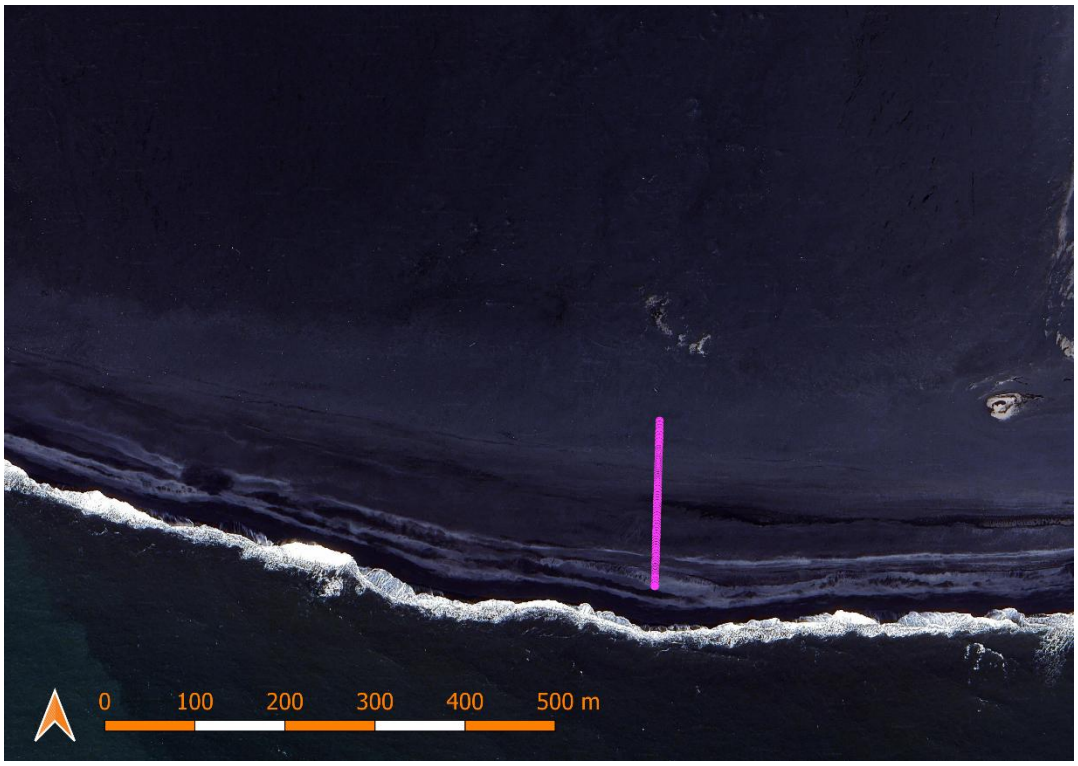

Figure 5 shows the location of profile 12 at Höfðafjara and the extent of the profile measured. The satellite photo is from Google Satellite from 2021 and gives a good indication of the rapidly retreating coastline there.

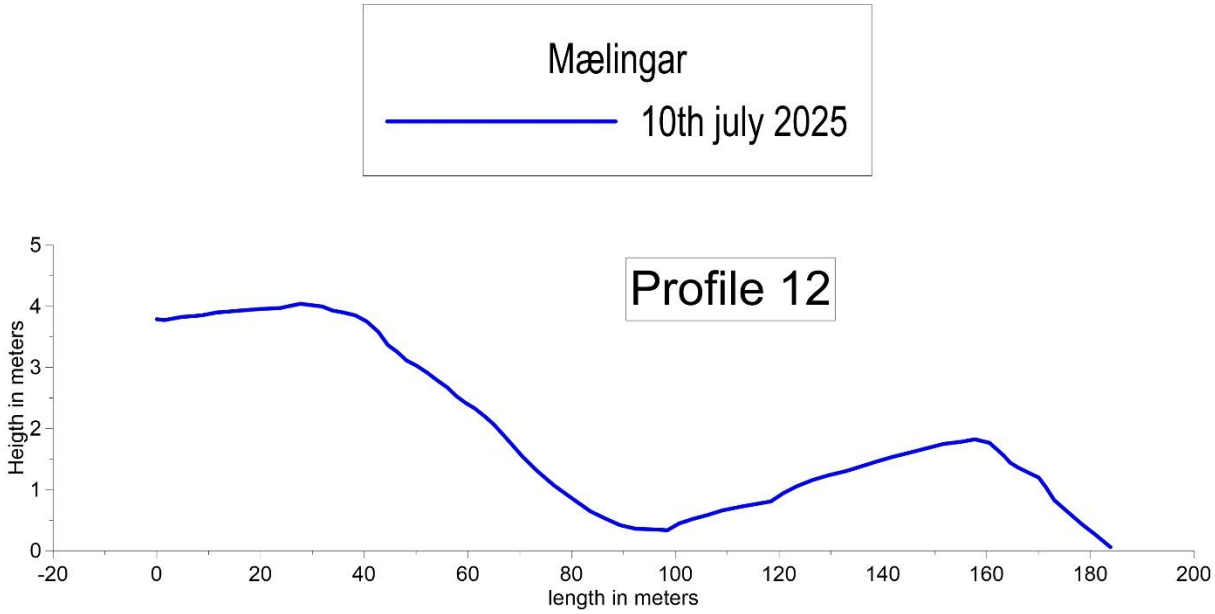

Figure 6 shows the measured profile at profile 12. As it was the first time the profile was measured, there is no reference to previous measurements.

The measured line of profile 12 is indictive of a profile that has recently been eroded (in early June), but since then the wave energy has been favorable and is pushing up material back on to the beach, which can be seen as the lower bar that extends from 100 to 180 meters on the profile.

Secondary reason for measuring this profile was to get measured points at the most southern point of Kötlutangi protrusion. Since 1918, during the eruption of Katla volcano, the protrusion has been the most southern point of mainland Iceland. In the recent years however, many have started to claim that Dyrhólaey is the most southern point of Iceland, which it was before the eruption in 1918. With measuring the most southern landward point of Kötlutangi, we can calculate which point lies further south.

For Dyrhólaey, the most southern point is the southern edge of the arch and has the coordinates:

ISN93: **493.618, 321.433**

For Höfðafjara, at 1 m height above sea level (in Víkurkerfi), the coordinates are:

ISN93: **513.194, 321.062**

Which means that the Höfðafjara beach, or Kötlutangi protrusion, is still 371 meters further south than Dyrhólaey is.

For further comparison, we can compare Dyrhólaey with the coordinates of the beach ridge at profile 12, which is arguably the most southern point of stable land there. That point has the coordinates:

ISN93: **513,198, 321.205**

Which is still 228 meters further south than the most southern point of Dyrhólaey.

We can therefore confirm that Kötlutangi is still the most southern point of mainland Iceland and has been since 1918.

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