

## A TRIP TO STEINDALEN

Excursion guide

*Please take this with you on your trip,  
but don't leave it behind as litter.*

A part of "Geologiskolen",  
<http://geologiskolen.uit.no/>

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# A trip to Steindalen

- geology and landscape on the way to the glacier















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## Overview

The Steindalen glacier (Steindalsbreen) in Lyngen is a popular destination for people who would like to see a glacier at close quarters. The glacier front is situated just 460 m a.s.l. and the walk up to it takes no more than a couple of hours.

The twelve localities in this excursion guide show places along the way that reveal the landscape history of the area and how the glacier has retreated after the ice age. The first locality lies at the entrance to the valley; the last one is at the glacier front. The table below gives an overview.

			
1 River terraces (90 m)	2 Rock treshold (200-250 m)	3 Rapids (240 m)	4 Rockslide moraine (250 m)
			
5 Rock flour (250 m)	6 End moraines (280-320 m)	7 Valley side fans (300-400 m)	8 Outwash plain (320-360 m)
			
9 Moraine ridges (400-550 m)	10 Kettle hole (430 m)	11 View (547 m)	12 Steindalen glacier (460 m)

The excursion guide is available as an interactive version where clickable images give an explanation for each locality:  
<http://geologiskolen.uit.no/lokalGeologiskolen/storfjord.html>. You are now reading a printer-friendly version suitable for taking with you on your trip to Steindalen.

## Practical information

Steindalen is located on the eastern side of the Lyngen Peninsula, south of Lyngsdalen and Furuflaten. From Oteren, drive north for c. 17 km on the west side of Storfjorden to just past Storeng. Cross the bridge over Steindalselva and turn left up a steep gravel path between the houses. This path leads to a community house and a small car park. The walking track up Steindalen begins here.

Allow at least 2 hours for the trip to the glacier, and 1½ hours for the return journey. Including stops, the trip takes about 6-7 hours.

Waterproof boots are recommended.

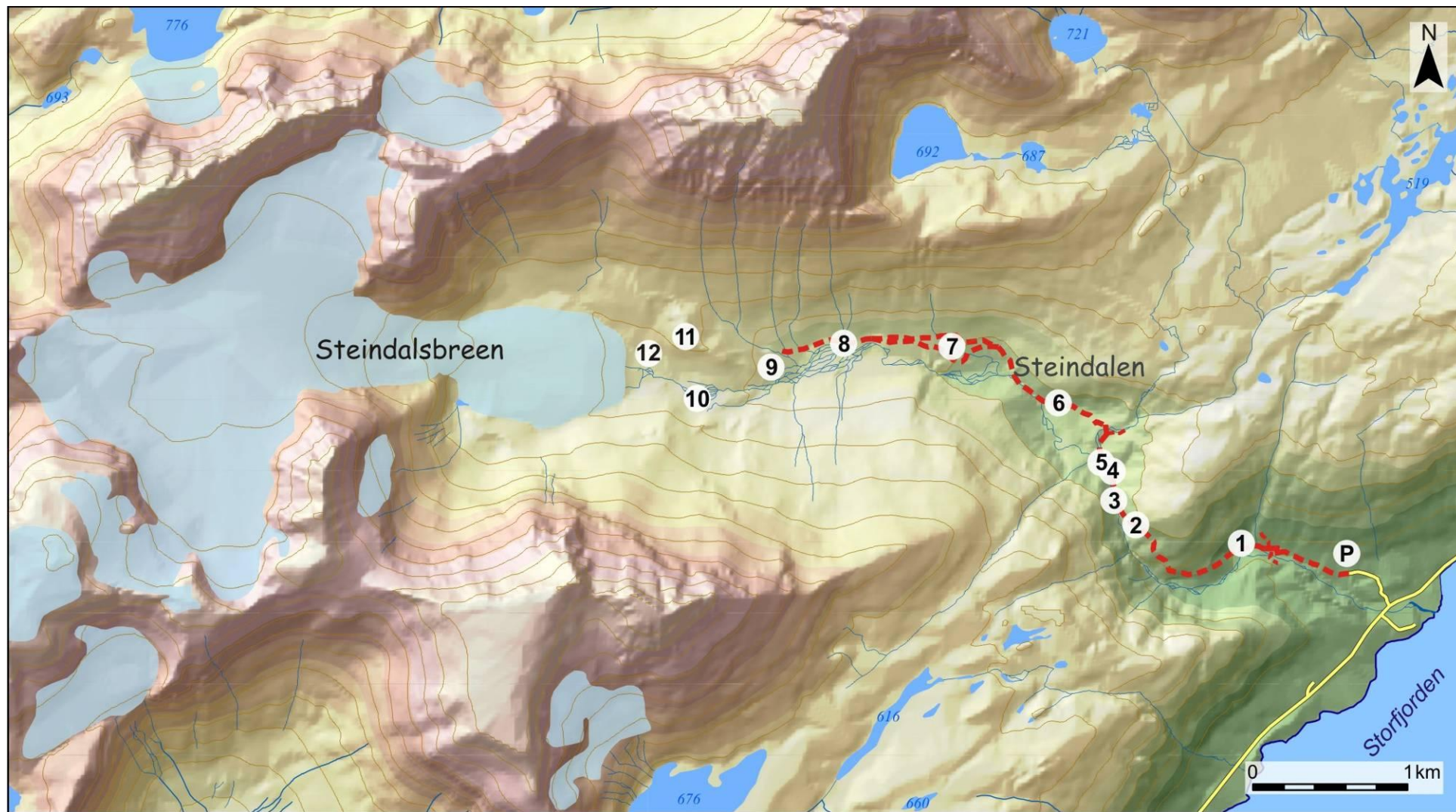
The glacier front is receding, and the walk gets slightly longer every year!



The path to Steindalsbreen starts here.



## Map



Map showing the route and twelve localities.



## 1 River terraces and uplift

(90 m.a.s.l.)



The first part of the walk follows the gently sloping **river terraces** beyond the car park. They can be seen clearly on the opposite side of the river, just below the steep entrance to the valley. The terraces were formed at the end of the ice age, about 10,000 years ago. At that time, Steindalsbreen was retreating rapidly and large amounts of sand and gravel were deposited at the mouth of the valley. **Uplift** after the ice age has raised the terraces above sea level, causing the river to cut through them. Similar terraces are forming today where the river enters the fjord.

## 2 Rock threshold and schist

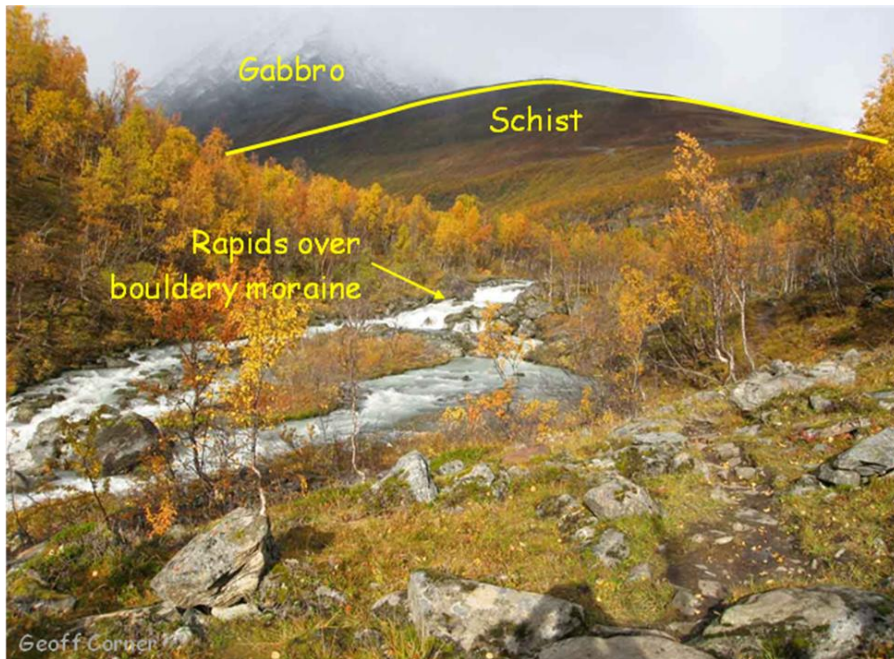
(200-250 m.a.s.l.)



A large **rock threshold** (riegel) guards the entrance to Steindalen and the path steepens here. Rock thresholds like this are common in valleys shaped by glaciers. The river here runs through a deep gorge. The bedrock is a dark grey **schist** which, in places, contains dark red garnets and white lenses of feldspar. The picture shows lichen-covered boulders of schist at Kvilarsteinen ('Resting stone').

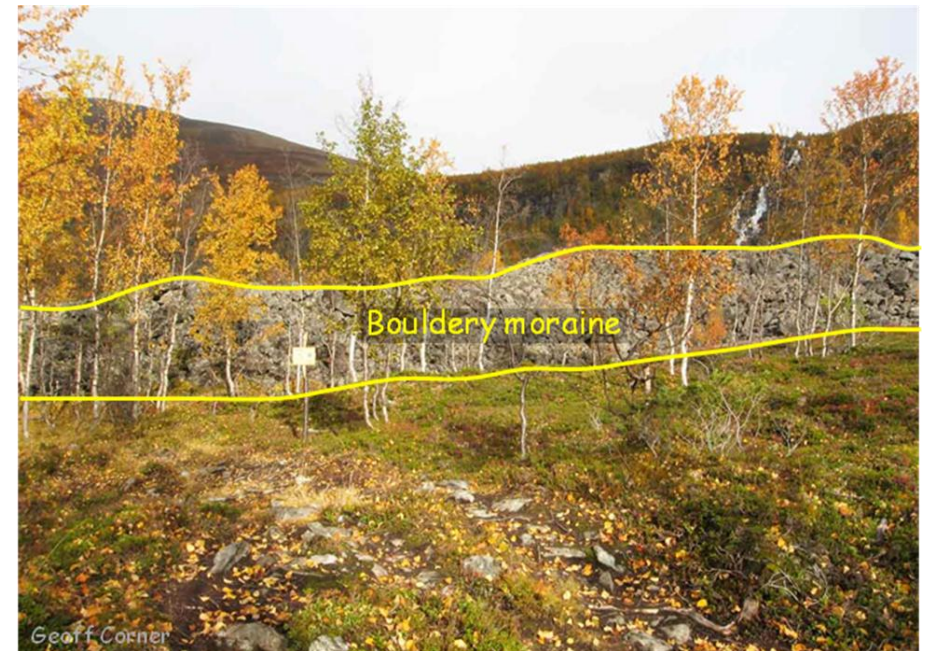


### 3 Rapids and view upvalley (240 m.a.s.l.)



The Steindalselva forms **rapids** at places where it crosses bouldery moraine. These picturesque rapids occur just above the threshold, where the valley opens out to give a view of the **Lyngen Alps**. Notice how the mountains in the background are much higher than the more rounded hills in the foreground. The difference is due to different bedrock. The Lyngen Alps are made up of hard gabbro, whereas the adjacent lower hills are made of softer schist.

### 4 Rockslide moraine (250 m.a.s.l.)



This bouldery deposit appears strange. The boulders consist of gabbro, which is not found otherwise in this part of the valley. The deposit probably formed as a **rock avalanche** that fell onto the glacier further upvalley at a time when Steindalsbreen filled the whole valley. The glacier then transported the boulders down the valley and dumped them here when the glacier melted. This happened at the end of the ice age, about 10,000 years ago. The bouldery deposit forms a special type of **glacial deposit** that we may term a 'rockslide moraine'.



## 5 Glacial river with rock flour (250 m.a.s.l.)



At this locality we look down from a morainic mound towards the confluence of two streams. The stream to the right (Tverrelva) comes from the waterfall on the northern side of the valley. Its water runs clear and contains little fine material. In contrast, the stream to the left (Steindalselva) is full of **rock flour**, which gives the water a milky appearance. Rock flour consists of ground-up mineral particles washed out from the glacier. It is clear evidence that the glacier is continuously grinding away at the bedrock.

## 6 End moraines from the ice age (280-320 m.a.s.l.)



A 15-20 walk from the previous locality leads up to a small moraine ridge that gives fine views up the valley. The moraine ridge was formed at the front of the glacier during a short readvance. A similar **end moraine** can be seen 600 m farther on. The moraine ridges show where the glacier front was located during its general retreat at the end of the last ice age.



## 7 Valley-side fans

(300-400 m.a.s.l.)



The track up the valley passes a series of grassy **gravel fans** on the northern side on the valley. Here, it is easy to walk, set up camp and find drinking water in streams or springs at the foot of the slope. During bad weather this is not a good place to stay. The fans have formed over thousands of years precisely during periods of bad weather when flooded streams, **debris flows** and snow avalanches have carried gravel and cobbles down the mountain side.

## 8 Outwash plain

(320 - 360 m.a.s.l.)



Meltwater from the glacier carries large quantities of cobbles, gravel, sand, silt and clay. The coarsest material - cobbles, gravel and some of the sand - is deposited immediately in front of the glacier as an **outwash plain**. The biggest outwash plain in Steindalen is located in front of an end moraine from the 'Little Ice Age' (see next locality). The glacier front remained at this position for a long time while the outwash plain was built up, probably over hundreds of years.



## 9 Moraine ridges from the Little Ice Age (400-550 masl.)



The largest moraine ridge in Steindalen is not from the ice age, but from the so-called **Little Ice Age** (AD 1750-1910). This was a cold period when Norwegian glaciers grew in size. Steindalsbreen readvanced several times and formed several **marginal moraines** close to one another. The oldest of these is covered with scattered plants and small bushes, whereas the youngest appears much fresher and is covered only with lichen and a few pioneer plants.

## 10 Outwash plain and kettle hole (430 m.a.s.l.)



The upper **outwash plain** lies only 500 m from the present glacier. It was formed mainly between 1940 and 1980. Deposition on the plain has decreased as the glacier front has receded. However, some changes are taking place. During the 1990's, a small, blue-coloured pool suddenly appeared on the southern side of the plain - the 'blue lagoon'. It occupies a **kettle hole**, formed when a buried mass of dead ice melted, creating a depression. The blue colour is caused by light refraction by fine particles in the water.



## 11 View of the Steindalsbreen glacier (547 m.a.s.l.)



Most people who visit Steindalsbreen follow the path that takes the easiest route up to the glacier. However, if you follow the crest of the high moraine ridge on the northern side of the valley to its summit, you will get a magnificent **view** both down the valley and towards the glacier.



## 12 In front of Steindalbreen

(460 m.a.s.l.)



Steindalsbreen has a gently sloping front with scattered **morainic debris** on its surface. **Meltwater** streams emerge from both sides. The newly forming outwash plain in front of the glacier will likely expand in the coming years as the glacier front recedes. Measurements carried out during the last 30 years show that the **glacier front has receded** at an average rate of 10-15 m a year, and that this rate is increasing. The sign in the picture shows the position of the glacier front on 5<sup>th</sup> July, 1998.

