

Front page:

Where may Syver (5) ski in 30 years?

What will happen to the winter country of Norway? In Syvers Oslo, a few days of skiing and sledging after a snowfall is the normal situation.

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This might be Syvers winter in 2052, 2082 and 2100.

Syver grows up, and will live in a warmer Norway. He is five years old. Where can he go skiing in 20, 60 and 80 years?

We dress warmly. Wool on the inside and windproof on the outside. Sour wind whips between the row houses. It's below freezing in all of Oslo today. Yr has forecast snow later in the day. Wow! Syver wants to put on his skis. Father and son stroll over to the playground. But there is still smooth ice and tufts of grass. Even with klister, he has no chance. In Syver's Oslo, a few days of skiing and sledging after a snowfall have become the norm, before slush and ice take over.

What will happen to the winter country and ski country Norway in the future?

It's just over a week until the UN climate panel releases a new report. There comes the verdict for natural types such as rainforests and coral reefs and for world regions such as the Mediterranean and Northern Europe.

While Syver and I slide around on the ice on the playground and he throws his skis in frustration, melancholic thoughts come.

Snow and winter are an important part of Norway. Mastering skiing is a given. I have written thousands of articles about climate change. Have almost always managed to maintain a professional distance from the dramatic content.

But it's closer now. The climate in our garden has already changed, and Syver will probably live throughout this century.

Most of us are most concerned with what is close to us. That's why we look at the ski conditions in Oslo where Syver and I live. But what we experience here is quite similar to what happens in many cities in southern Norway and occasionally along the coast in the north.

Precipitation in winter can just as easily be rain as snow. First 55 years back, and a quick flashback:

February 1966: When a lot of snow was completely normal.

I am five years old and put on my skis outside the door at Årvoll.

It's below freezing every day. It's winter from November to Easter every year. February 1966 is a classic cold and white winter month in Oslo.

On February 26th, there was 75 cm of snow in built-up parts of Oslo.

In large parts of the city, it is common to start the ski trip at home on the stairs.

There are 114 days with ski conditions in Oslo this year, and 166 days at Bjørnholt in Nordmarka². That's almost half a year, that's it. Completely normal! Norway is indeed a winter country.

February 2022: When the powder snow quickly became ice

Not one day this winter has Syver brought skis to kindergarten. Is Oslo still a winter city?

² Reference climate station in the forest north of Oslo that reflects the skiing conditions near Oslo well

After a decent winter in 2021, it is now miserable in the residential areas. Several snowfalls, but warm degrees and rain after a few days.

This winter there will probably be less snow than the statistical average.

The new normal says that there should have been about 26 days of ski conditions in the residential areas of Oslo and 95 days at Bjørnholt in Nordmarka.

It's 70 fewer days now than when I was five years old.

But like all weather, it varies a little from year to year. Maybe there will be lots of snow next year.

Norway has become 1.2 degrees warmer. In the north of the country, the temperature has increased even more. As a country in the Arctic, we are warming up faster than the rest of the world.

If the world, against all odds, manages to slow down warming to 1.5 or 2 degrees, today's warming and climate change will continue until around 2050, then flatten out. It will therefore take many years before warming and climate changes "calm down" anyway.

There are large delays in the climate system, and the full effect of greenhouse gases we have already emitted is not yet visible.

But now the world is steadily heading towards 3 degrees or more.

It's easy to think that the difference between 1 and 2 and 3 degrees of warming isn't that big. That's wrong. There is a very big difference.

In this article, we use three alternatives, three scenarios, for what will happen to Winter-Oslo in the future:

- One where the world achieves the Paris Agreement's goal of a maximum of 2 degrees of warming. We call this "best case".
- One that gives us a 3-degree world. We call this "likely".
- The third we call "worst case". This is if global emissions are not cut, but continue to increase at full speed in the decades ahead.

February 2052: Rare with snow in town

Syver has turned 35 years old. If he follows the statistical average, he is well on his way to adulthood, has gotten a job and started a family.

It's been 100 years since Oslo hosted the Winter Olympics. It's been 90 years since I could ski outside my house at Årvoll for 114 days during the winter.

Syver must travel up in altitude in Nordmarka or up to the mountains to teach his children how to ski. Only a few light trails in lowland areas have artificial snow. Interest in cross-country skiing is declining sharply and artificial snow in many warm degrees is expensive.

February 2082: Are skis still sold?

Syver is 65 years old. Maybe he's on his way out of working life. His children have moved out. A grandchild or two may have appeared.

Is there any point at all for them to get skis? Will sports stores bother to sell skis in Oslo in 2082?

Syver and his grandchildren must travel far from the coast or to the mountains for them to learn how to ski.

On the other hand, many winters there will be more snow on the mountain than there is now. This is because climate change will increase precipitation, and it will still be cold enough for precipitation there often comes as snow.

February 2100: Plus degrees and zero snow always

Syver becomes an old man. For his great-grandchildren, winter is exotic and rare. Maybe they can find snow high up in the mountains some periods.

It's too expensive to keep light trails and alpine facilities outdoors with artificial snow. Ski conditions will primarily be found indoors sports facilities. If anyone bothers to pay everything it costs.

These projections of Syver's winters in Oslo show climate change in practice. Zero ski conditions and skiing for his family are of course a low price to pay compared to what people experience elsewhere in the world. Where higher seas take land from people, coral reefs die and rainforests dry out. Millions must flee.

But Norway will also become another country than what we have known until now.

2052

In the best case:

Minus 0.5 degrees for most of February. 45 mm of precipitation in February. 10-15 days with skiing conditions in residential areas and 75 days at Bjørnholt in Nordmarka.

Likely:

0 degrees throughout February. Only 53 days a year with below zero temperatures (96 now). More precipitation than now, 45 mm of precipitation in February. Most comes as rain. There is rarely snow in residential areas, maybe five days of skiing conditions there and in low parts of Marka. 70 days of skiing conditions at Bjørnholt in Nordmarka.

Extreme episodes with precipitation become more frequent, also in winter. The episodes will cause local flooding, water in basements, landslides and flooded roads. On average every 10th year.

In the worst case:

0.4 plus degrees on average and only 10 winter days with below zero on average. 50 mm or more precipitation. Everything comes as rain. No ski days in Oslo city and lower part of Marka. 40 days at Bjørnholt.

2082

In the best case:

It is -0.1 degrees on average in Oslo for the entire month. That is 40 winter days. There will be 45 mm of precipitation and 5 days with skiing conditions in residential areas and 65 days at Bjørnholt.

Likely:

There will be warm degrees almost all of February, 0.6 degrees on average, and no winter days with below zero temperatures for a whole day.

There will be 52 mm of precipitation. Everything falls as rain in the lowlands. There will be no days with skiing conditions in residential areas and low-lying parts of Marka, but up to 50 days with skiing conditions at Bjørnholt in Nordmarka.

Syver will experience episodes with extreme precipitation episodes about every fifth year in 2082, which statistically means "at any time". The episodes will cause local flooding, water in basements, landslides and flooded roads.

No months of the year have below zero degrees on average in Oslo anymore.

In the worst case:

No days with below zero temperatures in February and 2.6 degrees on average. There will be 58 mm of precipitation. Everything as rain and no days with snow in Oslo or in lower parts of Marka. At Bjørnholt there may be up to 20 days with skiing conditions.

2100

In the best case:

On average 0 degrees and 45 mm of precipitation in February. No days with skiing conditions in residential areas, possibly up to 50 days with skiing conditions at Bjørnholt.

Likely:

The snowy cold Oslo winter is just a vague memory, nor is there skiing conditions at Bjørnholt in Nordmarka.

In this future, emissions of greenhouse gases are now greatly reduced and the climate is stabilizing. But there are still huge amounts of CO₂ in the atmosphere that will keep the climate relatively warm for many decades and centuries to come.

In the worst case:

Winter has completely left the lowlands throughout southern Norway. There are never below zero temperatures in Oslo and the lowlands of Norway. Also in the mountains there are few winter days with below zero temperatures all day.

Quotes by Hans Olav Hygen:

Page 26:

“The Oslo winter of 2022 is a perfect picture of the future. The new normal. We must get used to the fact that winter in Oslo is ‘on and off’. A few years ago, the temperature in February varied between minus four and minus ten. For several years to come, it will be normal to vary between a few plus degrees and eight minus. In ten years, another one to two winter weeks will probably be gone.”

Page 27, upper:

“The winter for people in Oslo in 2052 will be like Parisians have it now. Skiing will become exotic. Only the most avid and wealthy go on ski vacations. The proportion of Norway’s population that does not master skiing will increase because they do not naturally learn it as children by stumbling around with skis where they live. Many parents choose other vacations than the high mountains.”

Page 27, lower:

“In 2082, snow winters in Oslo will mostly come to an end. Artificial snow on light trails and ski slopes will be a temporary solution until the 2060/70s. It is technically possible to make snow in many warm degrees, but it is extremely expensive and the environmental aspect can put a stop to it.”

Image captions:

“Not a single day this winter has Syver brought skis to kindergarten. Klister does not stick to ice!”

“Syver and I sled. Maybe March will be more snowy than February has been?”

“The weather varies all the time. In the winter of 1966, there were 114 ski days in the Årvoll settlement where I lived at the time.”

Text and captions to graphs on page 26:

“Skiing may become exotic for people in Oslo in 2052. In 60 years, skiing conditions in lowland areas could be history.”

“Number of days with skiing conditions at Bjørnholt and in Oslo. The gray areas show the difference between the worst (bottom) and best scenario. The dotted line represents the most likely outcome.”

< Graph showing number of days with skiing conditions going down >

“The number of days with skiing conditions in 2022 is based on the average of the period 1991-2020.”

“In 2082, it may be above freezing in Oslo for the entire month of February.”

“Average temperature in February. The gray fields show the difference between the worst (bottom) and best scenarios. The dotted line represents the most likely outcome.”

< Graph showing the average monthly temperature of February in Oslo increasing >