Teresa Grøtan:
Swallowed by the Sea

Original Title: Før øya synker

Something is different

You may have noticed. Nature is changing, the weather isn't like it used to be. Something is different. Maybe you live in a place where there are new kinds of fish in the sea. Maybe you live in a place where the fish has disappeared. Maybe it rains more heavily than it used to. Maybe it doesn't rain anymore. Wherever you live, it has probably grown warmer.

When the weather – that is, the temperature, winds, and rain and snow – changes over time, we define it as climate changes. *The climate* is simply what the weather has been like on average for the last 30 years. For instance, we might have a really cold winter for a year or two, but if the winters in general have grown warmer the last 30 years, that means that we've experienced climate change.

We know that it's happening now. And we know that it's our fault.

The most important reason is that we've released too much carbon dioxide into the atmosphere, the layer of air that surrounds the Earth.

We know this for sure because we've been measuring the exact levels of carbon dioxide in the atmosphere all the way since 1958.

Carbon dioxide is a natural gas, and it is released naturally. In fact, you release a little bit of it every time you breathe. The problem isn't our breathing, it's the fact that we release a lot of carbon dioxide in other ways. The past 100 years we've increased these emissions by more than what the Earth – and us with it – can take. You probably know how this happens: by burning oil, coal and natural gas.

It's been warmer here before. When the dinosaurs roamed on Earth a 100 million years ago, the Earth was way warmer. It was probably (the scientists are still discussing this) for the same reasons as today: Too much carbon dioxide was released into the atmosphere. This all happened 99,8 million years before humans even existed, so it wasn't our fault. The reason might have been a powerful volcanic eruption, or it might have been that the huge tectonic plates, the continents, collided.

If it's been warmer before, does it really matter that it grows warmer now? It does, if we want to survive. Earlier, natural changes in the temperatures occurred over thousands, maybe hundreds of thousands of years. We have increased the amount of carbon dioxide by 40 percent in only 200 years, probably faster than ever before in Earth's history.

Five times in the history of Earth, the first time 420 million years ago and the last time 66 million years ago (when the dinosaurs died out), almost all life on Earth has been wiped out. Are we facing a sixth extinction now?

Are we going to wipe ourselves out, or will we find ways – and willingness – in time to save ourselves, so that the humans as a species, as well as all the other species we share the Earth with, will survive?

2016 was the warmest year in the history of humanity (the second and third warmest years were 2015 and 2017). That was also the year when the world's leaders signed the Paris Agreement, and committed to work hard to prevent the Earth from heating up more than two degrees, compared to 1850. By now it's already a little more than one degree warmer. Can we trust them to keep their word?

Normal kids, unnormal world

While researching for this book I've travelled a lot (and contributed way more to the carbon emissions than I like dwelling on, see the afterword for my emission accounting).

I've visited youth on a tiny island in the country of Kiribati in the central Pacific Ocean. I went there because this island will soon be inhabitable. The next leg of my journey took me to Bangladesh. I went there because Bangladesh is the country that will have the largest amount of climate refugees in the world when we get more extreme weather, and the oceans rise.

In both Kiribati and Bangladesh I expected to meet people that were sad, or even angry and shocked, because of what's happening. What I found was people living normal lives. A boy who loved playing volley ball with his friends. A girl who loved nothing better than getting a new dress. Young people who were bored, who babysat their younger siblings, who flirted with each other and spent time on their phones, who dreamt of bright futures, of travelling and experiencing the world. Normal lives.

What I was not prepared to find, is what I found in Norway, my home country. In Svalbard, the northernmost inhabited group of islands in the world, the temperature has risen by 7,5 degrees between 1967 and 2017. If the rest of Earth had heated up as much as Svalbard, most of it would be uninhabitable by now.

I wasn't prepared for the catastrophe that greeted me in the USA, either. The biggest fire in California's history broke out when I was there.

I was shocked by the fire, but the youth I was spending time with weren't all that surprised. They knew the extreme drought that California has been suffering from the past five years very well. Young Americans are currently in the middle of a lawsuit against President Donald Trump. They are accusing the American government of putting their lives and the lives of future generations in danger by not doing anything to put a stopper to climate change.

I've experienced a lot in my travels. I've seen how beautiful the world is – the turquoise, glimmering lagoons of Kiribati, the flutter of fiery red autumn leaves in the USA, the silvery mountain tops of Svalbard and the vast, warm and silky beaches of Bangladesh.

I've learned a lot in my travels. I've learned that all lives are normal, in the place that they're lived. Coconut palms might be exotic on Svalbard, but not in Kiribati. Glaciers would be an exotic phenomenon in Kiribati, but not so on Svalbard. I've learned that each and every normal life is *valuable*, exactly where it is being lived.

When I began working on this book, I had a sense of deep unrest, but I've learned that it's not too late.

There are two important reasons for that: The first reason is that, despite all gloomy prospects, it's still possible to save the world as we know it by changing out mindsets and using new technology. The second reason is the world's youth. Young people today are cleverer than

earlier generations. You are more educated, you are healthier and stronger. And, possibly most important of all: Young people today know the world and each other better. Knowledge and awareness is just what we need to care for and empathize with other people, and with nature.

The 5000-Year Avalanche

Where:
Svalbard

Who:
Adrian Selnes (aged 13)
Kine Selnes (aged 13)
Tor Selnes, their dad

Pia Bronken Eidesen (aged 13)

Kristin Maurud, teacher

What's happening:
The twins Adrian and Kine are almost killed by a powerful avalanche. Svalbard is experiencing the biggest and most rapid climate changes in the world.

Population, Norway: 5,2 million
Population, Svalbard: 2500

Carbon emissions per capita in Norway at large: 8 tonnes

It was a quarter past ten in the morning, but outside it was pitch black. It was the polar night, the time in the middle of winter when there's no hint of daylight, 'round the clock. Adrian was sitting on the couch, watching the sport news. His twin sister Kine was upstairs in her bed looking at something on her iPad. Their younger brother was asleep in the room next to hers, and their dad was asleep in the annex. It was December 19th, the first day of Christmas break.

Everything was quiet.

All of a sudden there was a sound of shattering glass. Adrian had just seen a news anchor talk about how the Chelsea manager, José Mourinho, had been fired, when the TV was flung over as huge amounts of snow broke through the big living room windows. He threw himself out of the couch just as it was crushed, the masses of snow hurling toward him.

The house shook as snow filled the living room, filled the hallway, filled the annex where their dad was sleeping, and then the house itself – not being built on a solid foundation, but on poles, like all Svalbardian houses – was torn loose, and began to slide. Books and toys and

clothes fell over Kine, shelves toppled, everything broke. The floor itself curved, their younger brother Erlend was shrieking, Kine was shrieking, but Adrian couldn't hear a single sound from his dad.

The entire house, with its three kids and one adult, slid all of 80 meters, and didn't stop until it slammed into another house.

Adrian, incredibly, managed to stay on his feet. He stared into the snow where the annex should've been. Where Dad should've been. All he could see was icy darkness. Dad must be dead.

Then he heard his dad's voice:
– Adrian!
And Adrian shouted back, louder than he'd ever shouted before:
– HERE!
His dad shouted:
– Kine and Erlend, are they alive??
– YES! Adrian bellowed.

On the first floor, Kine waded through the chaos of planks, furniture and clothes to get to her crying younger brother. It all was like a nightmare, but there was no waking up from it. Getting to Erlend, she managed to wrap them both up in some towels.

Rescuers, both professionals and volunteers, were arriving by the site of the avalanche, but the snow masses were enormous and uncontrollable. The rescuers floodlit the area to get an overview, but looked bewildered about; nothing was recognisable, it was as if the houses were Lego pieces that had been hurled about by a toddler throwing a tantrum. No-one had any idea how many people were buried in the snow, or where they might be.

Kine and Erlend were eventually rescued. Adrian walked out himself, barefooted. Their dad was sent to the hospital in Tromsø, on the mainland, by air ambulance.

Two of their neighbours, a man and a two-year-old girl, were killed.

The avalanche caught everyone off-guard. No-one expected that it was even a possibility. No-one in the local community, no politicians. No experts. No-one.

As far north as north goes

No kids anywhere live as far north as the kids on Svalbard. Here, children often wear beanies and mittens mid-summer. Temperatures below 0 degrees Celsius are more common than temperatures above it. And there are more polar bears than people.

Svalbard is so far north that hardly anything grows there. There are no trees, because the roots can't live in frozen soil.

In a valley with steep mountains to three sides and the bay to the fourth, you find Svalbard's only city; Longyearbyen. It was named after the American John Munro Longyear, the founder of Svalbard's first coal mining company. There's still an active coal mine in Longyearbyen, which supplies the city with electricity and heating. The coal mining industry is also the reason why Svalbard's carbon emissions are four times as large as that of the rest of Norway.

How is it to grow up here, and live here as a teenager? I've travelled to the northernmost settlement in the world, to find out how young people experience living so far north, in a place where the climate change is so palpable.

The average temperature on Svalbard has risen by 7,5 degrees Celsius since 1967. The same number for the world at large is 1,2 degrees. If the rest of the world had experienced the same rise in temperature as Svalbard, huge parts of planet Earth would be uninhabitable.

There are plenty of scientists doing research in this part of the world, so we know quite a bit about the climate changes on Svalbard. There are three main reasons why Svalbard's heating up quicker than anywhere else:

There's a lot of snow and ice on Svalbard. When the sun shines down and heats up the surface of the Earth, some heat is reflected back from Earth to space. White surfaces, like those covered in snow and ice, reflect way more heat than dark surfaces, like land and the open sea. The more ice and snow that melts, the more heat is reflected back, and the warmer it gets. That's one reason.

Another reason is that as it gets warmer, more water evaporates and rises into the atmosphere. Water vapor, just like carbon dioxide, prevents the heat from escaping through the atmosphere, it keeps the heat trapped.

The third reason has to do with the fact that it's still really cold here, even though it's steadily getting warmer. Because it's so cold, the heat radiating back from the Earth moves slower than it does in other places, and thus has 'better time' to heat up the Earth.

Being like everyone else

It's an early June morning, and I'm tagging along with Pia Bronken Eidesen on her way to school. She's a good friend of the twins, Kine and Adrian; they're all in the same class at Longyearbyen High School. Later this day the class will go on a hiking trip up Varden, one of the mountains surrounding the city.

– I *do* know what's happening in the world, but it's difficult when no-one around me is feeling the same way that I do. Everyone can contribute a little. By eating meat one less day a week, for instance. If all families did that, it would make a difference! But it's difficult for me as a kid to change the habits of the entire city.

Pia has brought with her two bags of empty soda cans. There's no deposit refund for the cans, as it is on the mainland, but they can still be recycled, and Pia is headed for the recycle bins.
– People often throw away the bags with the cans, she scoffs. – They really don't consider the environment.

She's wearing round, black-rimmed glasses, and around her neck hangs a silver necklace with a pendant shaped like Svalbard.

– Thinking about the climate puts me in a bad mood. Nothing is going to improve if we don't do something. Maybe the grown-ups can't afford to make changes, but if my generation is to grow up in a healthy world, one where we can experience cool stuff, we really can't afford *not* to make changes.

I ask Pia what can be done. It's not easy to be the first one to speak up, she replies. And she's right about that. It's a risk, you might be made fun of, be called a know-it-all, one who believe

themselves to be better than everyone else; one might be accused of being politically correct, which might sound like a good thing, but it's not meant as a compliment. It's always safer to blend in, to do and think and speak like everyone else.

Pia climbs onto her bike, heading for school with the morning sun shining on her back.

White June

After lunch, I meet up with Pia, Adrian and Kine's class. They're ready for their hike. We head out together from the cableway. The cables between the cableway and the coal mines used to be the black arteries of Svalbard: Containers of coal were sent down to the bay, where the coal was loaded onboard cargo ships and carried to the mainland.

Today, the cableway is not in use. Drawing a line down the mountainside towards the bay, it acts as a reminder of what both created and damaged this society: the coal.

The rest of the class and I are lagging behind as Adrian and a few of his friends set off swiftly up the mountainside, in the soft, grainy snow – a typical, soggy summer snow. It's midday, the sun is high in the sky.

A rock ptarmigan, it's plumage white, calls in the snow. A dovekie passes overhead.

June is really cold this year. The weather is acting up; it's not supposed to be this cold in June. And the winters are not supposed to be as mild as the past few have been.

The town is quickly growing small beneath us. The teacher, Kristin Maurud, has a rifle resting on her shoulder, and a flare gun at her hip. Walking unarmed outside of the city centre is illegal. It's not likely that we will run into a polar bear, but it might happen, and it has happened. Polar bears have been spotted near residential areas more often than they used to, and they are dangerous. Human flesh is not the bears' preferred diet, but if they are hungry enough, it'll make do for them. Only a few months ago a sow with two cubs walked through the streets of Longyearbyen. Luckily it happened in the middle of the night.

Kine and a couple of her friends playfight, wrestling in the snow. They're dressed in beanies, mittens, hiking pants, shell jackets and hiking boots with crampons (spikes that make it easier to walk in the snow). Some have brought skis, others have brought toboggans, and all of them are excited about the descent. It's going to be a quick race!

Kine talks about how nice it is to live in such a small place, so far north. Everyone trusts everyone, there's no need to lock your car or bike or front door, 'cause nobody steals anything.

Black Christmas

This day in June is as bright and breezy as that day in December was dark and desperate. Neither Kine nor Adrian will ever forget the day of the avalanche. The Christmas that followed is etched in their memories as well. It was quenched by the snow: the avalanche wiped away the decorations, the Christmas gifts, the presents and the Christmas food – everything was gone, everything was broken.

The house was shattered. Dad was in hospital. Dazed, Kine and Adrian's mom did a second Christmas shopping: seasonal foods, nice clothes, a red tablecloth and white candles. The very

last plastic Christmas three in the store. Presents. Whatever could be had, had to do. The computers for the kids were taken by the avalanche, instead they got a Playstation 4.

The day after the avalanche arrived with heavy rain. Christmas, normally white and icy cold, was dark and mild. The rain poured down heavily and the wind howled non-stop for a week. Neighbours came visiting in the house they borrowed. Many people cried. Kine thought that the days seemed hollow. Would they have to move away from Svalbard?

For Pia, too, the thought of the avalanche brings back painful memories. She'd found the storm the day before the avalanche exhilarating. The entire family had been out, testing the wind. If she hadn't held onto her mom tightly, she would've been swept away.

The following morning, she was excited to see the huge amounts of snow that had turned up overnight. Christmas snow! She hadn't worried much when her mom told her there had been an avalanche, and that she and Pia's dad would go and assist with the digging. Avalanches happened every now and then, after all. A snowmobile or two were buried under the snow, and that was that, normally.

When her parents came back home hours later, their faces drawn, Pia realized that something serious had happened. She was shocked to learn the news. Eleven houses had been smashed by huge amounts of snow that had slid off one of the city's surrounding mountains, Sukkertoppen. Never before had anyone been hit by an avalanche in Longyearbyen. Never before had anyone lost their lives to an avalanche while sleeping in their own beds.

Roughly a year later, the same thing almost happened again. This time, only seconds separated two girls and a deadly mass of snow in the street next to Kine and Adrian's. The snow came rushing down from Sukkertoppen this time as well. This made many people in Longyearbyen furious. The politicians had promised that they were safe!

The problem with the climate changes on Svalbard is that they are so tremendous and so rapid that the scientists can't keep up – they can't manage to predict what might happen. The avalanches were both the kind that is called a "5000-year avalanche", because on average only one avalanche of that size will occur every 5000 years. Now there were two in a little more a year. Could it have been a coincidence?

Coal and tourists

Despite the June snow, the sun is baking, and we sweat our way up the mountain side. Halfway up we pause to look down at Advent Bay. Teacher Kristin tells us that when she moved to Svalbard in 1995, the bay used to be frozen over every winter. It would typically be minus 30 degrees Celsius around Christmas, and it could stay as low as minus 10–12 until mid-April. They would ride their snowmobiles miles upon miles across the sea ice, out of Advent Bay and into Isfjorden, the Ice Fjord.

It's grown a lot warmer, Kristin says. There's rain in the winter. The fjord hasn't frozen over since 2004.

Kristin's experiences are confirmed by the scientists' measurements. The Arctic has been warmer for the past five years than it has ever been, since scientists started measuring the temperature in the Arctic in year 1900.

Kristin is puzzled by the climate change. Might it just be down to natural fluctuations? She worries about the fact that more and more tourists visit Svalbard. What's the biggest source of pollution, she wonders, looking down at the Advent Bay, with a huge cruise ship glistening in the sun: coal mining or tourism?

Kine and Pia agrees that there are too many tourists on Svalbard. The amount of tourists keeps increasing, and when hundreds of cruise ship tourists pour into the streets of central Longyearbyen all at once, they feel flooded. They don't like it when the tourists take photos of them without asking permission.

The truth is that both the coal mining and the tourism pollutes more than necessary. Both can be done in a more environmentally friendly way, if politicians and commerce would be willing to work to make it so.

We've reached the top of the Varden mountain. From here we can see all of Longyearbyen, we see the rounded Sukkertoppen across the valley, and behind us, further in, lies Platåfjellet, the Plateau Mountain, with its slope diving down towards the backside of the school building. It's a white, wild, beautiful landscape.

We write our names in the visitor's journal. Kristin, the rifle resting on her shoulder, makes sure no-one walks to close to the edge of the mountain.

There aren't many dangers on Svalbard. But there are these: Falling down from a mountain. Being eaten by a polar bear. Being caught by an avalanche while watching TV in your own living room.

Sukkertoppen

In the afternoon, we've all made our way down from the mountain. Everyone's been home for dinner. With loud clicks, Adrian and Kine fasten their bicycle helmets, and tightening the straps under their chins, they walk their bikes across the gravel and cross the road. The streetlights are leaning stiffly backwards. They are at odd angles because the soil, which used to be frozen year-round, now taws further and further down during summer. Houses that used to be safely secured on their poles in the permafrost, no longer are. Electrical cables are strained because the poles carrying them slide out. Earth and stone loosen and rush down from the mountain sides because the frost in the mountains is melting.

Kine and Adrian pass by the downtown skate ramp, bike by a sign saying "Danger! Landslides!" and throw their bikes down on the heap of snow outside the Clubhouse.

It's nice and warm inside. On the ground floor there is a seating area with couches, pennant banners across the ceiling, and disco lights. Behind a half wall there is a home-made multi-step couch and a gigantic screen where a racing game is being played.

The youth club is open Wednesdays and Fridays. The other days of the week, Kine and Adrian play soccer, handball or practice shooting at miniatures. In Svalbard practically everyone learns to shoot a gun, as you're obliged to carry one when walking outside of the city centre.

Pia, Kine and Adrian enjoy the white winter. On Svalbard, there are wide valleys with gentle, snowy slopes, there are glaciers and snow-covered mountain peaks. They can ride

snowmobiles. But they can no longer predict when there will be enough snow to do so. The difference between the seasons grows smaller, there's less snow in the winter.

And they know why. It's because of the carbon dioxide. Too much carbon dioxide.

I ask if Kine, Adrian and Pia believe that human-made climate changes was the reason for the avalanche.
– It was just an avalanche, Adrian says firmly.
– It might have been due to climate change, though, Kine says, her voice small.

That night, after coming home from the Clubhouse, Kine is sat down on her bed, scrolling on her phone. The house they live in now is almost identical to the one they used to live in, only mirrored. Sukkertoppen is still their neighbour. The difference is that two rows of houses are gone. Two broad strips of asphalt where there once were houses serve as a constant reminder of what happened.

Every now and then, Kine thinks about that fact that she was supposed to be sleeping in the annex with her dad on the day of the avalanche. She and her siblings took turns to sleep there when their mum was in Oslo for work. That night had been one of her nights. But Dad had said no, he had insisted that she'd sleep in her own room. Would she have been alive today if she hadn't?

From her bed, Kine can look out of her window. She doesn't have curtains, but a towel with a pirate on it covers half of her view. Through the rest of the window she looks straight at Sukkertoppen.