# What will happen when the 'Doomsday Glacier' disintegrates?

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QUAMRUL HAIDER

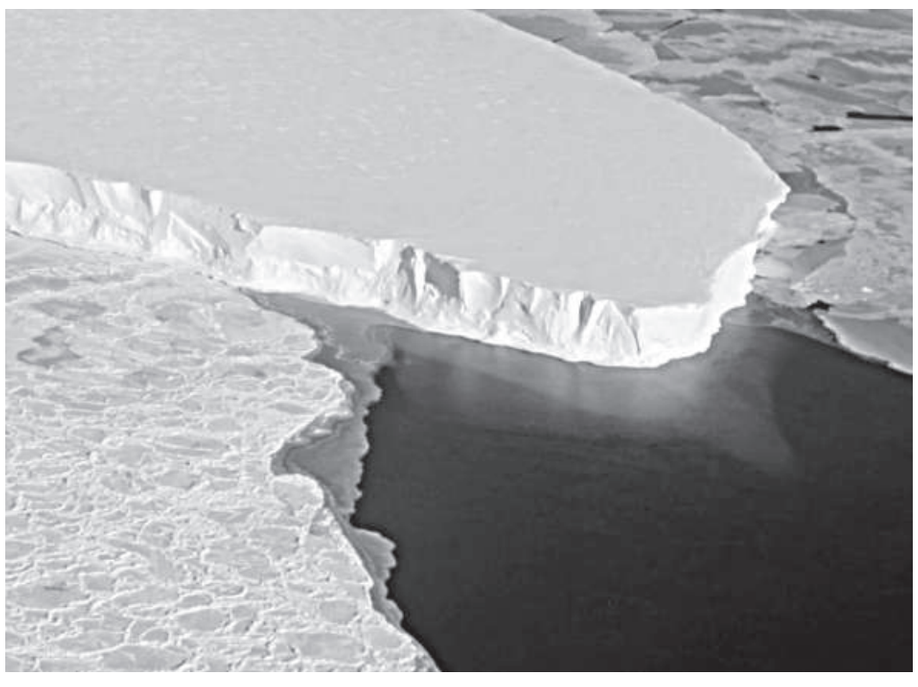
When all the glaciers in Antarctica will melt, sea level will rise some 70 metres, according to the US Geological Survey. Moreover, if the rest of the glaciers on Earth melts too, 7.6 metres will be added on top of Antarctica's drastic total, wiping out most of the low-lying countries in the world, while in urban settings along coastlines, it will threaten infrastructure vital for local jobs and regional industries.

Punishing heatwaves is not the only measure of global climate change that is undergoing an abnormally rapid change. Numerous other indicators, such as violent storms, long-lasting droughts, devastating floods, raging wildfires, and permafrost thawing, among others, suggest a more general global warming trend. An indicator that does not get much attention but will nevertheless have reverberating effects across the globe is the melting of glaciers and ice sheets, particularly in Antarctica.

As climate change drives global temperatures ever higher, glaciers and ice sheets in the polar and mountainous regions will inevitably melt. According to a paper published in Nature Climate Change (June 2020), Antarctica has warmed at over three times the global rate since 1989. As a result, glaciers in Antarctica, which contain about 90 percent of all the ice on Earth, are flowing into the oceans where they melt and raise the sea level. From 1979 to 1989, some 40 billion tonnes of glacial ice in Antarctica melted each year. A study published in 2019 in the Proceedings of the National Academy of Sciences reported that the amount jumped to 252 billion tonnes each year starting in 2009.

Since 1880, global sea levels have risen roughly 23 centimetres. Over the past decade, the sea level is rising at a much faster rate of 3.9 millimetres per year, as measured by NASA's satellite-based radar altimeters. The rise is mostly due to a combination of water melting from glaciers and ice sheets, as well as thermal expansion of seawater as it warms.

Scientists are particularly concerned about Thwaites Glacier, a massive block of ice in West Antarctica, approximately the size of Florida. It is nicknamed the "Doomsday Glacier" because if it were to collapse and melt, it could single-handedly cause global sea levels to rise by as much as 65 centimetres. As one of the fastest melting glaciers currently losing 50 billion tonnes of ice annually, Thwaites already accounts for four percent (0.15 millimetre) of the planet's sea level rise. In the 1990s, it was losing just over 10 billion tonnes of ice a year.



**The Thwaites Glacier in Antarctica.** PHOTO: REUTERS

The coastal edge of Thwaites that interacts with the ocean stretches 120 kilometres, while its thickness from bedrock to surface measures between 800 metres and 1,200 metres. A platform of ice called an ice shelf that floats above the Pine Island Bay acts as a brace, holding this frosty goliath back on the land, thereby slowing its journey to the sea. Thwaites also acts as a natural dam to the surrounding ice in West Antarctica and hence provides an important defence against the sea-level rise.

Ice shelves are highly vulnerable to a warming ocean. Accordingly, scientists believe that a complete collapse of Thwaites' ice shelf will spell the beginning of the end for the glacier. Without its ice shelf, the glacier will discharge all of its ice into the Amundsen Sea, which, after melting, will be devastating for coastal communities around the world. That is why scientists are interested in studying the interaction between ice shelves and oceans in an increasingly hotter world, in part because they are concerned about the stability of the ice shelves of Antarctica's other glaciers.

In a study published in May 2024 in the journal Proceedings of the National Academy of Sciences, researchers at the University of California, Irvine, using high-resolution images from satellites and hydrological data, found evidence of the intrusion of warm, high-pressure seawater at depths many kilometres beneath the grounded ice of Thwaites, causing "vigorous melting."

The widespread contact between the warm seawater and the glacier is rapidly melting the submerged ice at the underbelly and detaching it from the bedrock. In other words, seepage of warm water under Thwaites' base is "eating away at the ice shelf," which, in turn, is slackening its grip on the underwater seamount that keeps the glacier stable. Consequently, it is highly probable that Thwaites could disintegrate much faster than previously thought, six times faster than in the 1980s.

The researchers also noted the development of cracks and crevasses on the ice shelf of Thwaites, indicating that it is being structurally weakened. Because cracking and fracturing can have reinforcing feedback effect, the ice shelf will be further weakened, thus hastening its disintegration. Indeed, all evidences suggest that the ice shelf's "final collapse" could occur sooner rather than later, probably in less than a decade.

The findings by the researchers are alarming because the disintegration of Thwaites due to the deadly punch-jab-uppercut combination of melting from below, ice-shattering and eroding ice shelf could trigger the collapse of other glaciers held in check by Thwaites, potentially raising the global sea level by more than three metres in the coming decades. This is surely an ominous sign of the impending effects of climate change from the world's largest glacier.

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Previous computer models that forecast Thwaites' future did not account for seawater intrusions past the grounding line, which is the boundary between grounded and floating ice, although a study a decade ago concluded that such intrusions could double the speed of the glacier's melting. It is therefore expected that findings from all the studies will be used to fine-tune models to predict the Doomsday Glacier's future and make projections about sea-level rise more accurate.

Finally, there may be uncertainties about exactly what will happen in West Antarctica because predicting the speed of ice loss of glaciers and sea-level rise is not an easy task. And modelling glaciers, which are hydrologically dynamic, remote, and difficult to study, is a technological challenge. Yet, one thing is for sure. Glaciers will accumulate snow in winter and lose ice to melting in summer. But in a warming climate, melting will outstrip accumulation, resulting in a net loss of ice, thereupon adding to the already rising global sea levels.

# *Play should be a fundamental right for all children*

**Debra Efroymson**
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DEBRA EFROYMSON

Children's busy lives of school, tutoring, homework, and chores leave little time for anything else—including active movement and play. Yet play is vital to children's physical, mental, and social wellbeing. Play is not a unique human construction: baby animals engage in play, using it to learn a variety of important skills.

When children play—preferably at least some of the time outdoors and among others—they get necessary exercise, gain coordination, learn how to cooperate and socialise with others, and gain relief from stress. Play builds resilience, instils confidence, teaches creativity, and is vital for children's full development.

Many years ago, I encouraged my winter interns from the Asian University of Women to organise a parklet near our office. A parklet involves temporarily or permanently converting one or more car parking spaces into a space for play.

When my interns returned, flush with excitement, I listened to their stories about the euphoria of the local children on being invited to come out of their homes and into the street to play. But what I particularly remember is the story of one girl who finally made it downstairs just as my interns were packing up. They offered her a hula hoop, which she cheerfully used.

"Did you have fun?" they asked her when she paused to rest.

"Yeah!" she exclaimed.

"Where do you usually play?" they then asked.

"Play?" she looked at them blankly. "I don't play."

Upon hearing their story, I was shocked. I joke with my staff about having climbed mango trees and raced around rice paddy as a child; in fact, I played house in the mountains and converted rocks into dolls. My best friend and I would play as monkeys in the front yard, running to hide every time a lion (car) passed on the street "trying to kill us." (We were right on point there.)

**Play was a vital part of childhood; I couldn't imagine not being given the opportunity. Nor did all the time I spent playing take away from my achievements. On the contrary, I would argue that the active play and the imagination and creativity that play stimulated helped contribute to my academic and professional success.**

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It is tragic that so many parents and guardians are unaware of the vital nature of play in children's lives, believing it is a frivolous activity, a waste of time, or even a dangerous activity that puts children in contact with potentially harmful objects and people. In the effort to protect our children and prepare them for a demanding educational and future professional environment, too often we harm those we most cherish.

In order to bring attention to the importance of play, an international coalition of organisations including BRAC has come together to successfully convince the United Nations to make June 11 the International Day of Play.

As the organisers of the International Day of Play point out, play is (or should be) a fundamental right for all children. And yet too many children can't play because they lack the time or the opportunity, busy helping their families, studying, or unable to go outdoors due to horrific traffic.

FILE PHOTO: PRABIR DAS

**Children need to play, and to ensure that they can, we need policies, training, and funding.**

Children need to play, and to ensure that they can, we need policies, training, and funding so that play can become integrated into our educational institutions and communities. Those policies must ensure that all children have the ability to play, including those with disabilities, refugees, and other vulnerable children.

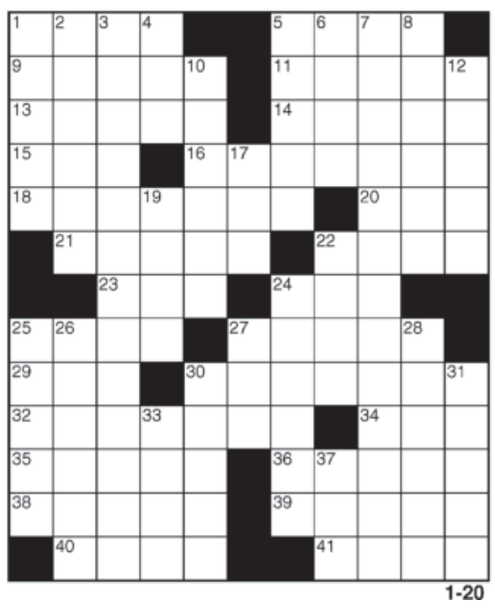
While virtually all children understand that play is important, one in three children in the world do not get to play. Children involved in the International Day of Play are calling on decision-makers and other adults to provide children with time and opportunity to play in diverse and inclusive ways, including in school, to listen to children's needs, and to support children in developing needed social and other skills through play.

Understanding the vital nature of play, and seeing how neglected it is at least in the cities of Bangladesh, I can only encourage my readers to learn more about the issue and join in the #InternationalDayofPlay. Our children will be healthier, happier, more resilient, more confident, and more able to take on the many challenges they will face in life. What's not to like?

## CROSSWORD BY THOMAS JOSEPH

**ACROSS**
1 Dearth
5 Thin cut
9 Rose pest
11 Broken, in a way
13 Ill will
14 Plentiful
15 Building wing
16 Gym item
18 Station workers
20 Nonsense
21 Wave setting
22 Storage spots
23 Sturdy wood
24 Pot brew
25 Mailbox part
27 Bargains
29 Join together
30 Part of a London bus
32 Outside our atmosphere
34 "Exodus" hero
35 Furtive fellow
36 Made mistakes
38 Door part
39 Located
40 Unspoiled spot
41 Cry of distress

**DOWN**
1 Surgical tool
2 Orchard crop
3 Arthur C. Clarke book
4 Young fox
5 Sky sights
6 Flock member
7Arthur C. Clarke book
8 Rat out
10 Go ashore
12 Shoulder muscles
17 Zoo beast
19 Winter wear
22 Rosary unit
24 Conical abodes
25 Sweeping sound
26 "Of Mice and Men" character
27 Clinic nickname
28 Phone part
30 Occupied
31 Boy, slangily
33 Newspaper part
37 Carnival city



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**THURSDAY'S ANSWERS**

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|---|---|---|---|---|---|---|---|---|---|---|
| L | E | O | N | | | S | H | A | R | P |
| A | R | G | O | T | | C | O | R | A | L |
| P | A | D | D | Y | | A | N | O | D | E |
| U | S | E | | P | E | N | G | U | I | N |
| P | E | N | C | I | L | | | S | A | T |
| | | | A | S | S | T | | A | N | Y |
| | S | E | N | T | | W | I | L | T | |
| T | I | M | | S | O | O | N | | | |
| A | L | A | | | P | E | N | T | A | D |
| P | E | N | A | L | T | Y | | E | V | E |
| S | N | A | P | E | | E | L | T | O | N |
| O | C | T | E | T | | D | O | R | I | S |
| N | E | E | D | S | | | W | A | D | E |