



1
00:00:08,180 --> 00:00:04,180
[music]

2
00:00:12,390 --> 00:00:16,570
NARRATION: Operation IceBridge has now returned to the Pine Island Glacier, not once,

3
00:00:16,590 --> 00:00:20,760
but twice in 2012. And the year-old

4
00:00:20,780 --> 00:00:24,870
giant crack in the glacier, poised to create an iceberg the size of New York City?

5
00:00:24,890 --> 00:00:29,080
Well it's still there, and that iceberg has yet to break free.

6
00:00:29,100 --> 00:00:33,270
But the rift has grown longer, much wider, and spawned a secondary crack.

7
00:00:33,290 --> 00:00:37,410
Before we talk about when that mighty berg will be born,

8
00:00:37,430 --> 00:00:41,520
let's take a look at the IceBridge missions themselves.

9
00:00:41,540 --> 00:00:45,620
IceBridge's first return to the region was a high altitude flight over the entire region,

10
00:00:45,640 --> 00:00:49,690
including the Thwaites, Smith, and Kohler glaciers.

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00:00:49,710 --> 00:00:53,760
After this campaign is over, scientists will be able to compare this broad survey

12
00:00:53,780 --> 00:00:57,810
with previous years' measurements in order to better document the rapid and widespread changes

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00:00:57,830 --> 00:01:01,980

in the region over time. For the second mission,

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00:01:02,000 --> 00:01:06,170

NASA's DC-8 flew, as it does for most IceBridge flights,

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00:01:06,190 --> 00:01:10,350

at 500 meters above the ice, and this mission was about creating a brand new set of data.

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00:01:10,370 --> 00:01:14,530

The flight lines took the team over previously unmeasured tributaries

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00:01:14,550 --> 00:01:18,710

of the glacier, and also surveyed the bedrock below them,

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00:01:18,730 --> 00:01:22,900

to provide a baseline for measuring change in the future.

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00:01:22,920 --> 00:01:27,080

So why all this focus on the Pine Island region? NASA Goddard calving specialist Kelly Brunt

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00:01:27,100 --> 00:01:31,250

says the ice in the region is substantially thinning and its flow is accelerating.

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00:01:31,270 --> 00:01:35,440

BRUNT: Ultimately the change that we see

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00:01:35,460 --> 00:01:39,610

in that whole region, not just Pine Island but also its neighbor, Thwaites Glacier,

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00:01:39,630 --> 00:01:43,770

this change represents the largest input

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00:01:43,790 --> 00:01:47,900

to sea level rise from an Antarctic source.

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00:01:47,920 --> 00:01:52,020

NARRATION: The rift has been an intriguing phenomenon

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00:01:52,040 --> 00:01:56,140

to watch over this last year, but is it a really important event?

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00:01:56,160 --> 00:02:00,230

BRUNT: When we talk about Antarctica and we talk about

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00:02:00,250 --> 00:02:04,330

the health and state of our ice sheets, we talk about mass balance.

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00:02:04,350 --> 00:02:08,360

And what you have on one side of the equation is accumulation,

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00:02:08,380 --> 00:02:12,390

or snowfall coming in. And when we talk about balance, that has to be balanced by things

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00:02:12,410 --> 00:02:16,580

coming out. And in Antarctica that happens either through surface melt,

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00:02:16,600 --> 00:02:20,770

or basal melt, or the big number, in Antarctica,

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00:02:20,790 --> 00:02:24,950

is calving. Calving accounts for 80 percent of that side

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00:02:24,970 --> 00:02:29,130

of the equation. So when you see calving in Antarctica, even

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00:02:29,150 --> 00:02:33,320

even calving when we use small states or the island of Manhattan

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00:02:33,340 --> 00:02:37,510

as a unit of measure – this is generally very normal – it's part of the process.

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00:02:37,530 --> 00:02:41,710

NARRATION: However, Brunt says once the glacier calves,

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00:02:41,730 --> 00:02:45,910

the new calving front will be further upstream from any calving front we've seen in the last 40 years.

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00:02:45,930 --> 00:02:50,080

BRUNT: I've used the analogy of a fingernail, to talk about calving.

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00:02:50,100 --> 00:02:54,240

Generally, if your fingernail breaks

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00:02:54,260 --> 00:02:58,360

in the white, it's normal and you don't worry about it.

42

00:02:58,380 --> 00:03:02,490

If your nail breaks below the white, you think about it, you remember it.

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00:03:02,510 --> 00:03:06,590

If you lose your whole nail, that's a big deal. Much of the calving,

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00:03:06,610 --> 00:03:10,680

of the net loss through calving,

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00:03:10,700 --> 00:03:14,740

can be equated to losing the white part of your fingernail.

46

00:03:14,760 --> 00:03:18,790

Things that we saw in the early 2000s in the Antarctic Peninsula side,

47

00:03:18,810 --> 00:03:22,910

the Larsen A the Larsen B ... that's equivalent to losing your whole nail.

48

00:03:22,930 --> 00:03:27,100

What's going on in Pine Island is probably that intermediate.

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00:03:27,120 --> 00:03:31,300

We've broken our nail and it's below the white

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00:03:31,320 --> 00:03:35,490

and it's something to watch and it's something to monitor over time.

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00:03:35,510 --> 00:03:39,670

NARRATION: As a byproduct of the recent IceBridge flights,

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00:03:39,690 --> 00:03:43,850

the team got some great views - and measurements - of the evolving crack,

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00:03:43,870 --> 00:03:48,020

which has been filled in somewhat by blowing snow.

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00:03:48,040 --> 00:03:52,210

The crack appears to only have a short distance to go before a new iceberg is born.

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00:03:52,230 --> 00:03:56,330

It's still hard to know when that will happen, but conditions seem to be right.

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00:03:56,350 --> 00:04:00,480

BRUNT: Sea ice acts as a buttress or a

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00:04:00,500 --> 00:04:04,580

dampener to sea swell that actually protects the front of these

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00:04:04,600 --> 00:04:08,690

ice shelves or the front of these glaciers from calving. So the fact that there's no

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00:04:08,710 --> 00:04:12,740

sea ice in front of the Pine Island Glacier right now implies

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00:04:12,760 --> 00:04:16,820

that it might be in a state that's sort of primed to calve.

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00:04:16,840 --> 00:04:20,880

NARRATION: After IceBridge heads back home from this campaign, its data will be used to monito

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00:04:20,900 --> 00:04:24,920

the state of Antarctic ice sheets, while satellites will continue to watch