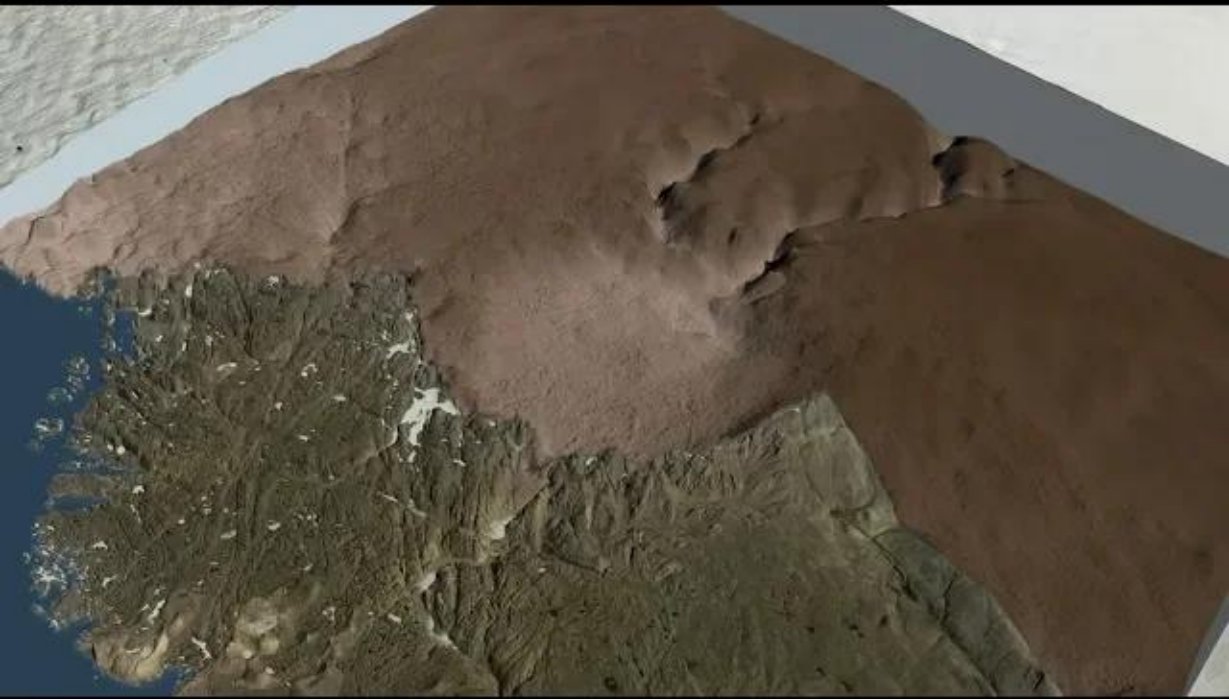

1
00:00:00,330 --> 00:00:04,560
In a remote area of northwest Greenland, [music rises]

2
00:00:04,560 --> 00:00:08,750
an international team of scientists has

3
00:00:08,750 --> 00:00:12,990
made a stunning discovery, buried beneath a kilometer

4
00:00:12,990 --> 00:00:17,180
of ice. It’s an impact crater …

5
00:00:17,180 --> 00:00:21,400
300 meters deep … 31 km wide

6
00:00:21,400 --> 00:00:25,690
… much bigger than Washington, D.C.,

7
00:00:25,690 --> 00:00:29,890
even bigger than Paris, and it’s probably

8
00:00:29,890 --> 00:00:34,150
one of the youngest large impact craters on Earth.

9
00:00:34,150 --> 00:00:38,480
The relentless spread of the Greenland Ice Sheet has covered the crater, obscuring

10
00:00:38,480 --> 00:00:42,700
obscuring it from view for thousands if not hundreds of thousands of years.

11
00:00:42,700 --> 00:00:46,910
Even so, scientists say it was essentially hiding in plain sight.

12
00:00:46,910 --> 00:00:51,180
So what finally revealed its presence?

13
00:00:51,180 --> 00:00:55,420

It all started with a rock … a map …

14
00:00:55,420 --> 00:00:59,610
and a connection made by scientists at the Natural History Museum in Copenhagen.

15
00:00:59,610 --> 00:01:03,920
Each day, scientists there pass by a large

16
00:01:03,920 --> 00:01:08,120
iron meteorite found in Greenland decades ago.

17
00:01:08,120 --> 00:01:12,330
One day, they got a new map of the bedrock topography beneath the ice sheet,

18
00:01:12,330 --> 00:01:16,550
mostly based on ice-penetrating radar data collected

19
00:01:16,550 --> 00:01:20,750
onboard NASA's P-3 aircraft over two decades. [Sound of aircraft engine]

20
00:01:20,750 --> 00:01:24,950
This map gets more refined all the time, yet there are still areas open

21
00:01:24,950 --> 00:01:29,180
to interpretation, including the conspicuously semicircular

22
00:01:29,180 --> 00:01:33,360
edge of the ice sheet, drained by the Hiawatha Glacier.

23
00:01:33,360 --> 00:01:37,550
There, the data showed a circular depression in the bedrock,

24
00:01:37,550 --> 00:01:41,770
near the region where that courtyard meteorite had been found.

25
00:01:41,770 --> 00:01:45,990
In May of 2016, the team sent the German research plane

26
00:01:45,990 --> 00:01:50,200
Polar 6 to fly over Hiawatha Glacier with a powerful new

27
00:01:50,200 --> 00:01:54,490
ice-penetrating radar.

28
00:01:54,490 --> 00:01:58,750
Radar waves can travel through the ice, measuring its thickness

29
00:01:58,750 --> 00:02:03,080
and internal structure. Studying data from this airborne survey,

30
00:02:03,080 --> 00:02:07,340
the scientists confirmed the telltale bowl shape and central peaks

31
00:02:07,340 --> 00:02:11,590
beneath Hiawatha Glacier. They also found that the oldest ice

32
00:02:11,590 --> 00:02:15,820
in this crater was actually fairly young, by Greenland standards,

33
00:02:15,820 --> 00:02:19,930
and had experienced a great disturbance in its flow toward the end

34
00:02:19,930 --> 00:02:24,230
of the last ice age. [Sound of hammer on rock]

35
00:02:24,230 --> 00:02:28,470
The team then visited the area on foot, and in sediments deposited by a river

36
00:02:28,470 --> 00:02:32,690
draining out of the glacier, they found grains of the mineral quartz that showed signs

37
00:02:32,690 --> 00:02:36,950
of being physically shocked in a massive impact.

38
00:02:36,950 --> 00:02:41,130

Models suggest, the asteroid was more than a kilometer wide.

39
00:02:41,130 --> 00:02:45,320
The Hiawatha crater is one of the 25 largest known

40
00:02:45,320 --> 00:02:49,950
impact craters on Earth, and the first found under any of

41
00:02:49,950 --> 00:02:54,260
our planet’s ice sheets.Crucially, the Hiawatha impact

42
00:02:54,260 --> 00:02:58,550
crater still looks like an impact crater, even though it’s covered by ice

43
00:02:58,550 --> 00:03:02,750
and seems to be rapidly eroding. The data as a whole

44
00:03:02,750 --> 00:03:07,030
suggests it’s quite young – geologically speaking

45
00:03:07,030 --> 00:03:11,320
But we don’t know exactly when an asteroid sped

46
00:03:11,320 --> 00:03:15,550
toward Earth, through the atmosphere, and into the

47
00:03:15,550 --> 00:03:19,840
planet’s crust in Northwest Greenland. [Sound of impact]

48
00:03:19,840 --> 00:03:24,080
It was likely less than 3 million years ago.

49
00:03:24,080 --> 00:03:28,320
But it might have been as recently as during the last ice age,

50
00:03:28,320 --> 00:03:33,370
12 to 115 thousand years ago.

51
00:03:33,370 --> 00:03:37,560
The impact could have also occurred when ice already covered Greenland

52
00:03:37,560 --> 00:03:41,780
and it would have instantly vaporized billions of tons of ice and re-routed

53
00:03:41,780 --> 00:03:45,990
the flow of ice and water into the ocean.

54
00:03:45,990 --> 00:03:50,250
Whenever the impact happened, life on Earth at the time would have been profoundly affected.

55
00:03:50,250 --> 00:03:54,750
An impact of this size is unlikely

56
00:03:54,750 --> 00:03:58,920
to happen again soon, but evidence that it might have happened

57
00:03:58,920 --> 00:04:03,000
not so long ago, in Earth’s history is essential to assessing the risk today.

58
00:04:03,000 --> 00:04:07,100
This is the first study of the Hiawatha