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00:00:00,000 --> 00:00:08,000

How could the weather in space have impacted the fate of the Titanic?

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00:00:08,000 --> 00:00:14,000

A strong geomagnetic storm can cause havoc on a large scale.

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00:00:15,000 --> 00:00:21,000

What secrets of America's nuclear past lie in the frozen waters of Greenland?

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00:00:21,000 --> 00:00:27,000

The fact that people haven't realized what it was is mind-blowing.

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00:00:27,000 --> 00:00:34,000

And who is to blame when a bag of human hands is found on the banks of a Siberian river?

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00:00:34,000 --> 00:00:38,000

Who are these people? Whose hands are they?

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00:00:41,000 --> 00:00:45,000

The underwater realm is another dimension.

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00:00:45,000 --> 00:00:54,000

It's a physically hostile place, where dreams of promise can sink into darkness.

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00:00:55,000 --> 00:01:05,000

I'm Jeremy Wade, and I'm searching the world to bring you the most iconic and baffling underwater mysteries known to science.

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00:01:05,000 --> 00:01:11,000

The vast majority of our ocean is unobserved, unmapped and unexplored.

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00:01:11,000 --> 00:01:17,000

It's a dangerous frontier that swallows evidence.

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00:01:17,000 --> 00:01:20,000

Do you have nowhere to run?

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00:01:20,000 --> 00:01:27,000

Where unknown is normal, and understanding is rare.

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00:01:37,000 --> 00:01:40,000

It's a tale we all know.

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00:01:40,000 --> 00:01:42,000

April 14th, 1912.

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00:01:42,000 --> 00:01:49,000

RMS Titanic collides with an iceberg and sinks into the freezing water of the North Atlantic.

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00:01:49,000 --> 00:01:52,000

More than 1,500 people perish.

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00:01:52,000 --> 00:01:58,000

The reasons behind the world's most infamous ocean disaster have been debated for more than a century.

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00:01:58,000 --> 00:02:01,000

From lack of lifeboats to human error.

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00:02:01,000 --> 00:02:10,000

Now, could a phenomenon called space weather change everything we thought we knew about the loss of this unsinkable ship?

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00:02:11,000 --> 00:02:25,000

The largest moving man-made structure on Earth sets sail from Southampton, heading to New York on its maiden voyage.

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00:02:25,000 --> 00:02:31,000

Over 2,000 passengers and crew are on board the Titanic.

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00:02:31,000 --> 00:02:36,000

It was the largest and most luxurious ship that had been built.

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00:02:36,000 --> 00:02:42,000

It was supposed to be the most secure, the safest, the most watertight.

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00:02:42,000 --> 00:02:49,000

Everybody knows the story of the Titanic. Greatest ship, a ship that wasn't made to sink, actually sank.

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00:02:49,000 --> 00:02:55,000

Four days into her journey, the Titanic collides with an immense iceberg.

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00:02:55,000 --> 00:03:04,000

The frozen mass towers 100 feet above the water and weighs an immovable 2 million tons.

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00:03:07,000 --> 00:03:14,000

Only 705 people survive, less than a third of those on board.

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00:03:14,000 --> 00:03:22,000

How did this happen? How come no one came to the rescue right away? Who's to blame?

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00:03:22,000 --> 00:03:27,000

We're still searching for answers more than 100 years later.

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00:03:27,000 --> 00:03:33,000

An inquiry begins into what went so tragically wrong.

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00:03:33,000 --> 00:03:42,000

The month-long investigation is overseen by Lord Mersey, who takes volumes of notes in his private journals.

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00:03:42,000 --> 00:03:50,000

After the hearings end, these journals are kept locked away by his descendants for more than a century.

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00:03:50,000 --> 00:03:55,000

It's not until 2020 that they're finally released.

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00:03:55,000 --> 00:03:58,000

His journals reveal his innermost thoughts on the inquiry.

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00:03:58,000 --> 00:04:04,000

Can Lord Mersey's newly disclosed writings finally expose the truth?

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00:04:04,000 --> 00:04:11,000

He mentions in the journal that the watertight doors in the hull were left open after initially being closed.

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00:04:11,000 --> 00:04:20,000

If these doors are left open, then water can flood the length of the vessel and also create instability as the weight shifts.

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00:04:21,000 --> 00:04:30,000

This finding was made public in the initial investigation, but the notes also confirm something that's only ever been speculated.

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00:04:30,000 --> 00:04:40,000

Mersey had underlined and paid special attention to one key detail. There was no reduction in speed following the impact.

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00:04:41,000 --> 00:04:52,000

Captain Smith ordered the ship to move forward at a steady pace for another 20 minutes, a decision that had disastrous consequences.

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00:04:54,000 --> 00:05:01,000

By keeping going, that means more water coming into the hull. This puts pressure on the bulkheads.

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00:05:02,000 --> 00:05:09,000

The journals give us new insight into how the ship sank so quickly.

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00:05:12,000 --> 00:05:17,000

But the full story of how the collision happened is still a mystery.

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00:05:19,000 --> 00:05:30,000

Then a scientific discovery in 2020 gives rise to a completely new theory, something that has never been considered before.

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00:05:31,000 --> 00:05:39,000

The night that it sank, it was actually a very beautiful, very cold, but very calm night. The sea was said to have been really flat.

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00:05:40,000 --> 00:05:50,000

Many of the people who were rescued said, oh, the aurora borealis were beautiful that night. They fanned through the sky. It was marvelous. It was spectacular.

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00:05:50,000 --> 00:06:03,000

Behind this beautiful light show lies formidable power, and it's something that weather researcher Mila Zinkova believes could have played a defining role in the Titanic disaster.

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00:06:04,000 --> 00:06:11,000

The aurora borealis is the most beautiful manifestation of a geomagnetic storm.

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00:06:11,000 --> 00:06:22,000

Geomagnetic or solar storms are caused by charged particles shooting towards the Earth at a speed of nearly 200,000 miles per second.

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00:06:24,000 --> 00:06:37,000

The magnetic field guides these particles towards the north and the south pole, and so when they come down to around the 100 kilometers or so, they bang into the molecules of the air and they cause light to be emitted.

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00:06:38,000 --> 00:06:44,000

And these charged particles in the sky cause more than an extraordinary light show.

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00:06:46,000 --> 00:06:52,000

A strong geomagnetic storm can cause havoc, and I mean havoc on a large scale.

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00:06:53,000 --> 00:07:02,000

All this kind of cloud of particles cause the magnetic field to kind of wobble or to vibrate, and that generates currents in the Earth.

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00:07:02,000 --> 00:07:07,000

If you look at the global risks to civilization, a space where there is right up there.

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00:07:09,000 --> 00:07:14,000

So extreme weather conditions in space can wreak havoc on Earth.

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00:07:15,000 --> 00:07:21,000

1989, a geomagnetic storm causes a 12-hour power outage in Quebec.

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00:07:22,000 --> 00:07:28,000

It damages a nuclear power plant in New Jersey, plunging 6 million people into darkness.

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00:07:29,000 --> 00:07:37,000

That solar storm of 1989 was an immensely powerful storm. Big. Bigger than your average solar storm.

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00:07:38,000 --> 00:07:43,000

Could a similar event have contributed to the sinking of the world's greatest ship?

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00:07:45,000 --> 00:07:56,000

In the Titanic era, a compass was the most important navigational tool, an instrument that depends totally on the stability of the Earth's magnetic field.

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00:07:57,000 --> 00:08:03,000

If you were sitting on a ship in the middle of the ocean, a wobble to the magnetic field could make

it look like North was somewhere else.

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00:08:04,000 --> 00:08:12,000

Could the geomagnetic storm that night have affected the ship's compass so much that it changed the Titanic's intended course?

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00:08:13,000 --> 00:08:18,000

Formate was important to establish the strength of the geomagnetic storm.

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00:08:19,000 --> 00:08:25,000

By studying the space weather from that night, Mila made a vital breakthrough.

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00:08:26,000 --> 00:08:32,000

I believe that the geomagnetic storm that night was around moderate to strong.

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00:08:33,000 --> 00:08:44,000

Most major solar storms occur between 50 and 55 degrees of geomagnetic latitude, the precise region where the Titanic is found.

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00:08:45,000 --> 00:08:56,000

Something else has also been recently discovered, a hand-drawn observation of the sun from the day

before the Titanic sinks, showing a sunspot.

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00:08:57,000 --> 00:09:07,000

Sunspots are areas on the sun where the magnetic field is much stronger. This can cause solar flares and explosions called coronal mass ejections.

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00:09:08,000 --> 00:09:13,000

These can contribute to even more powerful geomagnetic storms on Earth.

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00:09:14,000 --> 00:09:20,000

Is this further evidence that an intense solar storm played a decisive role in the tragedy?

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00:09:21,000 --> 00:09:28,000

Aurora Borealis happens all the time. Where there are people in the Canadian Maritime going, whoo, this is a light show.

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00:09:29,000 --> 00:09:34,000

Where there are people on the American West Coast, Alaska and Norway seeing the same thing.

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00:09:34,000 --> 00:09:41,000

Mila's research on covers that magnetometers around the world did in fact pick up the storm.

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00:09:42,000 --> 00:09:48,000

Sensors in Alaska, Canada and Scotland all are disturbed around the time of the sinking.

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00:09:49,000 --> 00:09:54,000

So this celestial event was strong enough to be detected everywhere.

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00:09:55,000 --> 00:09:59,000

But did it have a critical influence on the reliability of the Titanic's compass?

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00:09:59,000 --> 00:10:03,000

The compass was not reliable. Cause it affected the ship travel.

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00:10:04,000 --> 00:10:15,000

Mila believes if the compass was just 0.5 degrees off, it could have altered the Titanic's course and therefore how it collided with the iceberg.

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00:10:16,000 --> 00:10:19,000

A slight difference in the angle would have changed everything.

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00:10:20,000 --> 00:10:25,000

The ship hits the iceberg on the side and six of the 16 compartments are damaged.

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00:10:25,000 --> 00:10:31,000

If three of the watertight compartments had been damaged, it might have survived.

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00:10:33,000 --> 00:10:45,000

A solar storm may have contributed to the catastrophic sinking of the Titanic, but further investigation is showing that its effects may not have been entirely destructive.

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00:10:46,000 --> 00:10:51,000

It could even have played a key beneficial role in the rescue of the survivors.

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00:10:56,000 --> 00:11:07,000

More than 2,000 passengers and crew fought for their lives on the night the Titanic sank.

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00:11:08,000 --> 00:11:16,000

Over 700 of them managed to escape the icy depths of the North Atlantic. Many people are still wondering how they did it.

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00:11:17,000 --> 00:11:25,000

New research suggests space weather played a key role in the rescue ship Carpathia finding the survivors.

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00:11:26,000 --> 00:11:30,000

Was this a celestial saviour to those in need of rescue?

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00:11:32,000 --> 00:11:41,000

2340 hours, April 14th, 1912. The Titanic has collided with an iceberg of unimaginable size.

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00:11:42,000 --> 00:11:48,000

The ship's fourth officer, Joseph Boxall, determines their position to send out an SOS.

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00:11:49,000 --> 00:11:54,000

Boxall calculates the SOS position and he's 13 nautical miles off.

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00:11:55,000 --> 00:12:05,000

If the geomagnetic storm did affect the Titanic's compass, it could have contributed to this false reading with big ramifications for the rescue.

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00:12:06,000 --> 00:12:17,000

The Titanic's incorrect position is sent out. Yet bizarrely, one ship, the RMS Carpathia, manages to locate the stricken lifeboats.

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00:12:17,000 --> 00:12:21,000

How could this be possible if they received the wrong location?

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00:12:21,000 --> 00:12:28,000

I believe the geomagnetic storm was responsible for helping Carpathia to find the Titanic survivors.

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00:12:28,000 --> 00:12:34,000

As well as the Titanic's compass, Mila believes the storm also affected the Carpathia,

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00:12:34,000 --> 00:12:38,000

accidentally leading them straight to the lifeboats.

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00:12:40,000 --> 00:12:48,000

One researcher told me it couldn't be a geomagnetic storm because if it was, then all ships in the area would have been affected.

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00:12:48,000 --> 00:12:58,000

And guess what? They all were affected? Titanic, Californian, Mount Temple and the Carpathia. All of them, all four ships.

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00:13:01,000 --> 00:13:09,000

If the Carpathia had not been affected by the compass variation, it could have missed the lifeboats by six nautical miles.

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00:13:10,000 --> 00:13:13,000

It was a lucky coincidence and dissituation.

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00:13:14,000 --> 00:13:20,000

Because of this, the Carpathia saves 705 people from the freezing water.

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00:13:21,000 --> 00:13:27,000

But could the storm have had a further impact on why more boats didn't come to the Titanic's aid?

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00:13:29,000 --> 00:13:36,000

The storm that night might have affected the radio communication of nearby ships with cataclysmic effect.

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00:13:37,000 --> 00:13:46,000

Some ships were able to communicate with ships that were farther away from them, but were not able to communicate with the ships that were closer.

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00:13:47,000 --> 00:13:52,000

Many ships that night report abnormal malfunctions of their communication equipment.

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00:13:54,000 --> 00:14:03,000

La Provence could contact the Titanic, but could hear the Olympic, which was 500 miles further away than the Titanic.

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00:14:04,000 --> 00:14:11,000

The Baltic couldn't hear the Mount Temple, but it could communicate with the Virginia, which was further away.

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00:14:12,000 --> 00:14:17,000

The Mount Temple responds to the SOS, but the Titanic doesn't get the call.

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00:14:19,000 --> 00:14:26,000

What dealt the definitive blow to the Titanic, with its 2200 people on board, will continue to confound us.

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00:14:27,000 --> 00:14:33,000

But the might of space weather has added a new line of inquiry to this tragic mystery.

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00:14:34,000 --> 00:14:46,000

It was just another strike for it. I guess once you say you have an unsinkable ship, the universe is going to turn against you and try to sink you at whatever the cost.

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00:14:47,000 --> 00:14:58,000

Every year, 8 million tons of trash ends up in our oceans.

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00:15:00,000 --> 00:15:09,000

In 2018, on a remote Siberian island, something turns up that is truly bizarre. A bag of frozen hands.

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00:15:09,000 --> 00:15:16,000

Where it came from and how it ended up on this icy beach puzzles locals and scientists alike.

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00:15:19,000 --> 00:15:25,000

The Amur River in the southeast of Siberia, 19 miles from the border with China.

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00:15:26,000 --> 00:15:31,000

On March 8th, 2018, a fisherman makes a grim discovery.

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00:15:32,000 --> 00:15:34,000

He sees a hand coming out of the snow.

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00:15:34,000 --> 00:15:42,000

He searches for clues as to where it has come from and makes an even more disturbing find.

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00:15:43,000 --> 00:15:48,000

When he goes to investigate it further, he finds 53 more hands.

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00:15:49,000 --> 00:15:53,000

The severed frozen hands are spilling out of an unmarked bag.

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00:15:54,000 --> 00:15:59,000

It is not a good day if you stumbled upon a bag full of frozen hands.

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00:16:00,000 --> 00:16:04,000

This gory find sparks intense speculation.

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00:16:04,000 --> 00:16:12,000

Why would somebody have a bag of frozen hands? Who are these people? Whose hands are they?

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00:16:14,000 --> 00:16:20,000

Incredibly, body parts washing up on shores around the world is not a new phenomenon.

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00:16:22,000 --> 00:16:28,000

There were cases of feet showing up on the coastline in Canada.

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00:16:29,000 --> 00:16:33,000

15 feet have been found over 12 years.

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00:16:34,000 --> 00:16:41,000

Investigations reveal the feet had become severed from the decomposing bodies of accidental deaths or suicides,

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00:16:41,000 --> 00:16:46,000

kept intact by the sneakers that acted as flotation devices.

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00:16:48,000 --> 00:16:55,000

Unique ocean currents in this wild and remote area pushed them all onto a small strip of shore in British Columbia.

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00:16:56,000 --> 00:17:03,000

Can the same science help pinpoint where the gruesome bag of hands started its Siberian journey

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00:17:04,000 --> 00:17:07,000

and lead investigators to the people responsible?

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00:17:09,000 --> 00:17:12,000

Were they brought there? Did they go through the water?

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00:17:13,000 --> 00:17:17,000

You could have it sort of going along the bottom in a slower manner

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00:17:17,000 --> 00:17:21,000

versus the speed at which it would probably travel if it stayed on the surface.

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00:17:22,000 --> 00:17:26,000

How the bag traveled would also depend on the Siberian climate.

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00:17:27,000 --> 00:17:34,000

The water around the island where the bag was found wouldn't have been fully flowing until April.

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00:17:35,000 --> 00:17:40,000

So there could be ice jams which could raise the level of the river.

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00:17:41,000 --> 00:17:46,000

All of these little pieces of information and clues can help to reconstruct their history.

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00:17:47,000 --> 00:17:52,000

Whether the bag washed ashore the previous spring and was then buried under snow

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00:17:52,000 --> 00:17:56,000

or just traveled a short distance more recently is unknown.

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00:17:57,000 --> 00:18:01,000

But this doesn't stop some people jumping to sinister conclusions.

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00:18:03,000 --> 00:18:06,000

Clearly they were collected and put together.

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00:18:07,000 --> 00:18:11,000

As the story breaks, wild rumors circulate.

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00:18:12,000 --> 00:18:16,000

This location is 19 miles from where the river borders with China.

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00:18:17,000 --> 00:18:20,000

Is this the work of the Russian or Chinese mafia?

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00:18:21,000 --> 00:18:26,000

Could it be evidence of limbs cut off to hide their identities?

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00:18:26,000 --> 00:18:31,000

When a bag of frozen hands washes up from a Siberian river,

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00:18:31,000 --> 00:18:36,000

there's intense speculation that organized crime syndicates are involved.

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00:18:37,000 --> 00:18:42,000

They're infamous for disposing their victims in the watery depths of rivers and oceans.

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00:18:43,000 --> 00:18:47,000

However, authorities didn't know that the river was a river.

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00:18:48,000 --> 00:18:51,000

They didn't know that the river was a river.

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00:18:51,000 --> 00:18:54,000

They didn't know that the water was a river.

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00:18:55,000 --> 00:18:58,000

They didn't know that the river was a river.

155

00:18:58,000 --> 00:19:01,000

They didn't know that the water was a river.

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00:19:02,000 --> 00:19:06,000

But it's not the same as the watery depths of rivers and oceans.

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00:19:07,000 --> 00:19:10,000

However, authorities discount the controversial theory

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00:19:10,000 --> 00:19:14,000

and announced that the hands have come from a local forensics lab.

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00:19:15,000 --> 00:19:19,000

It's a claim that raises even more suspicion.

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00:19:21,000 --> 00:19:26,000

In some cases, when a dead body is discovered and you're unable to identify it,

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00:19:26,000 --> 00:19:31,000

medical examiners will retain one of their hands to hold on to the fingerprints.

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00:19:31,000 --> 00:19:35,000

This way, they hope to be able to identify them in the future.

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00:19:35,000 --> 00:19:39,000

Why wouldn't you just do the fingerprints with the hands still attached to the body?

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00:19:41,000 --> 00:19:47,000

Forensic labs elsewhere in the world have been known to hold on to body parts.

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00:19:48,000 --> 00:19:50,000

London, 1989.

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00:19:50,000 --> 00:19:56,000

In a tragic accident, the Martian S pleasure boat collides with a dredger on the river Thames

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00:19:56,000 --> 00:19:57,000

and sinks.

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00:19:57,000 --> 00:19:59,000

51 people are killed.

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00:20:01,000 --> 00:20:06,000

More than 20 hands of the victims of the Martian S are severed and retained.

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00:20:06,000 --> 00:20:10,000

These hands should have been returned to their rightful owners

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00:20:10,000 --> 00:20:12,000

and buried along with the rest of the human remains.

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00:20:13,000 --> 00:20:18,000

The hands from the Martian S disaster and the 54 frozen hands found in Siberia

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00:20:18,000 --> 00:20:20,000

do have something in common.

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00:20:21,000 --> 00:20:24,000

They've all been immersed in water.

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00:20:26,000 --> 00:20:33,000

You can get expansion and changes to the skin that's going to alter what the prints look like.

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00:20:33,000 --> 00:20:40,000

So to be able to fingerprint a hand that's gone through that type of decomposition is very difficult.

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00:20:42,000 --> 00:20:48,000

At the time of the Martian S disaster, fingerprinting is the main way to identify a dead body.

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00:20:49,000 --> 00:20:56,000

And the only lab that has the equipment to take prints from waterlogged hands has limited storage.

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00:20:58,000 --> 00:21:05,000

However, 30 years later when the Siberian frozen hands are discovered, forensic methods have moved on.

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00:21:06,000 --> 00:21:11,000

We don't need to sever hands anymore to identify who someone is.

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00:21:13,000 --> 00:21:19,000

Today, DNA analysis and other tools tell us so much more than fingerprints can.

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00:21:20,000 --> 00:21:25,000

Radiocarbon dating can be used to determine when an individual lived and died.

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00:21:26,000 --> 00:21:31,000

Stable isotope analysis allows us to determine the kinds of things that they ate,

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00:21:31,000 --> 00:21:35,000

while strontium isotope analysis can tell us where they grew up.

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00:21:36,000 --> 00:21:43,000

Why would the frozen hands be removed when advances in forensic investigation means it's no longer necessary?

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00:21:44,000 --> 00:21:51,000

Storing a body takes up a lot of space and is quite costly in a morgue facility that has refrigeration.

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00:21:52,000 --> 00:21:57,000

So instead, storing a single hand is much easier and cost effective.

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00:21:59,000 --> 00:22:04,000

If they were retained for identification, why are they then found abandoned in a bag?

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00:22:06,000 --> 00:22:10,000

This is not the way though you dispose of human remains in any circumstance.

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00:22:11,000 --> 00:22:17,000

A day after the discovery in a bizarre twist, the official narrative is refuted.

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00:22:18,000 --> 00:22:25,000

Both the forensic authorities and the disposal company strongly deny any involvement.

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00:22:25,000 --> 00:22:29,000

They claim their last disposal was made in 2015.

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00:22:30,000 --> 00:22:35,000

Who severed the hands and why may never be fully proven,

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00:22:35,000 --> 00:22:39,000

but is there still a chance of finding out who they belong to?

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00:22:40,000 --> 00:22:44,000

DNA is particularly well preserved in very cold climates.

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00:22:44,000 --> 00:22:48,000

Some of the best preserved DNA we've ever discovered has come from the Siberian region,

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00:22:48,000 --> 00:22:50,000

even in the case of Ice Age animals.

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00:22:50,000 --> 00:22:54,000

So there's every chance that this DNA will lead us to who these people are.

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00:22:55,000 --> 00:23:01,000

What the genetic tests could reveal and if they will even be undertaken is still unknown.

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00:23:01,000 --> 00:23:06,000

And there's still one big obstacle to finally solving this puzzle.

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00:23:07,000 --> 00:23:13,000

If these people aren't on record and nobody's actively looking for them, this could remain a mystery.

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00:23:13,000 --> 00:23:20,000

In the early hours of Sunday, May 31st, 2020, the megaton oil tanker Willowey is sailing in the South Atlantic

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00:23:20,000 --> 00:23:23,000

when it puts out an urgent May Day call.

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00:23:24,000 --> 00:23:27,000

They've lost control and they're spinning in circles.

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00:23:28,000 --> 00:23:33,000

Other ships in the area are reported to be experiencing the same bizarre disease.

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00:23:34,000 --> 00:23:38,000

The first one to be found is the Mekaton Oil Tanker.

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00:23:38,000 --> 00:23:44,000

Other ships in the area are reported to be experiencing the same bizarre rotating.

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00:23:44,000 --> 00:23:49,000

What could be causing this inexplicable nautical nightmare?

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00:23:54,000 --> 00:23:59,000

The ship carrying thousands of tons of crude oil starts spinning in a circle.

210

00:24:00,000 --> 00:24:02,000

They lost control.

211

00:24:03,000 --> 00:24:09,000

Confusion erupts on the bridge as the captain desperately tries to get back on course.

212

00:24:09,000 --> 00:24:12,000

You would be in a huge state of panic.

213

00:24:12,000 --> 00:24:15,000

It's devastation waiting to happen.

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00:24:15,000 --> 00:24:23,000

What's even more frightening for the crew of the Willowey is that four other ships are reported to be sailing in circles nearby.

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00:24:24,000 --> 00:24:28,000

The potential for destruction is terrifying.

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00:24:29,000 --> 00:24:33,000

If they don't fix it, they could well converge and crash.

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00:24:34,000 --> 00:24:41,000

How is it possible for five gigantic vessels to be turning in circles in the middle of the ocean?

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00:24:42,000 --> 00:24:47,000

To have so many ships at one time having the same human error seems quite odd.

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00:24:48,000 --> 00:24:52,000

Perhaps there's some sort of other physical force at play.

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00:24:59,000 --> 00:25:15,000

300 miles off the coast of South Africa, the crew of the oil tanker Willowey are desperately searching for a reason as to why they have suddenly started turning in circles, dangerously close to four other ships.

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00:25:16,000 --> 00:25:23,000

At first the senior officers assumed that it's secret that the ocean itself are moving the ships around.

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00:25:24,000 --> 00:25:29,000

Could the answer behind this mystery be down to the sheer power of the water?

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00:25:30,000 --> 00:25:38,000

Ocean currents may have contributed to its spinning a bit. It's unlikely that ocean currents could make a ship spin continuously.

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00:25:39,000 --> 00:25:48,000

With the strength of the ocean currents unlikely to be causing these bizarre nautical rotations, what else might be behind this terrifying event?

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00:25:49,000 --> 00:25:52,000

The ocean is quite a lawless place.

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00:25:53,000 --> 00:25:57,000

Could a new growing criminal activity be responsible?

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00:25:58,000 --> 00:26:05,000

The more connected we are to the internet and international systems, the more likely we are to experience hacking.

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00:26:06,000 --> 00:26:09,000

Could someone have remotely hijacked the ship?

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00:26:10,000 --> 00:26:16,000

Hackers can manipulate a vessel's navigational tools by overriding its GPS signal.

230

00:26:16,000 --> 00:26:24,000

You are feeding false data to the ship, so it thinks it's doing a correct heading, it's going in the right way.

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00:26:25,000 --> 00:26:29,000

So if you can fool them, then the ship will go where you want it to go.

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00:26:30,000 --> 00:26:33,000

It's an illegal practice called spoofing.

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00:26:34,000 --> 00:26:38,000

But why would hackers want to manipulate the Willowey's GPS?

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00:26:39,000 --> 00:26:47,000

An oil tanker could potentially be the target of spoofing to alter its course for some sort of nefarious purpose.

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00:26:48,000 --> 00:26:51,000

Say for example to run a vessel aground in a narrow strait.

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00:26:52,000 --> 00:26:59,000

The 57,000 tons of crude oil on the Willowey could be worth more than \$11 million.

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00:27:00,000 --> 00:27:05,000

Are criminals trying to re-root it in an attempt to steal the valuable cargo?

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00:27:06,000 --> 00:27:14,000

Piracy has not gone away. It's often connected with large multinational criminal organizations.

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00:27:15,000 --> 00:27:19,000

Huge organizations which have a lot of money, a lot of resources.

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00:27:20,000 --> 00:27:27,000

In 2020 GPS data appears to show more megaton cargo ships spinning out of control.

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00:27:28,000 --> 00:27:34,000

With scientific investigators SkyTruth revealing a strange case of Point Reyes, California.

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00:27:35,000 --> 00:27:39,000

It shows many circles which are supposed to be the paths of different ships.

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00:27:40,000 --> 00:27:47,000

The team monitoring the Californian data believe these tracks are possibly the result of large scale GPS manipulation.

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00:27:48,000 --> 00:27:54,000

Designed to undermine a tracking network called Automatic Identification System or AIS.

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00:27:56,000 --> 00:28:00,000

It's a system that ships have to have now to track where they are.

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00:28:01,000 --> 00:28:04,000

It means you can finally see who's doing what.

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00:28:05,000 --> 00:28:10,000

Until AIS started monitoring criminal activity, the sea was much harder to police.

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00:28:11,000 --> 00:28:19,000

There is piracy, there is illegal contraband smuggling, there is human trafficking, there is the training in arms.

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00:28:20,000 --> 00:28:21,000

It's really a wild west.

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00:28:22,000 --> 00:28:28,000

So obviously there is a huge interest by a lot of criminals in subverting these systems.

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00:28:29,000 --> 00:28:36,000

Extreme manipulation of the AIS system has also been investigated along the Chinese coast in 2019.

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00:28:37,000 --> 00:28:46,000

When the GPS of hundreds of ships mysteriously malfunctioned, all of them reportedly close to valuable targets for criminals.

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00:28:47,000 --> 00:28:51,000

This seems to often occur near oil ports and refinery facilities.

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00:28:52,000 --> 00:29:00,000

Is this evidence that powerful entities are determined to distort the GPS of ships in order to conceal criminal activity?

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00:29:01,000 --> 00:29:06,000

International states are engaging in hacking of all forms more and more.

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00:29:07,000 --> 00:29:12,000

So there's every chance that international superpowers could be responsible for GPS spoofing.

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00:29:12,000 --> 00:29:19,000

No one knows for sure who is behind the spoofing of the Chinese and American coasts.

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00:29:20,000 --> 00:29:24,000

But is the willowy a victim of GPS manipulation?

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00:29:25,000 --> 00:29:30,000

Where the oil tanker was sailing may give a tantalizing clue.

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00:29:31,000 --> 00:29:33,000

There's less patrols, there's less scrutiny on that route.

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00:29:34,000 --> 00:29:37,000

So it would be much easier to hijack a vessel off the west coast of Africa

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00:29:37,000 --> 00:29:41,000

than would off the coast of Europe, for example.

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00:29:42,000 --> 00:29:47,000

After urgent investigation, the crew of the willowy in communication with officials on shore

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00:29:48,000 --> 00:29:52,000

come to a conclusion as to what is behind this bizarre behavior.

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00:29:53,000 --> 00:29:55,000

The ship's gyro compass.

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00:29:56,000 --> 00:30:02,000

It's one of the systems which the ship relies on in order to maintain a steady course.

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00:30:03,000 --> 00:30:05,000

The gyro compass is wrong.

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00:30:05,000 --> 00:30:08,000

It's not calibrating.

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00:30:09,000 --> 00:30:14,000

If it fails, it could cause exactly the issues which the willowy is experiencing,

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00:30:15,000 --> 00:30:18,000

potentially resulting in a crash with a nearby ship.

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00:30:19,000 --> 00:30:23,000

Luckily, they avoid a collision by switching to their secondary gyro compass,

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00:30:24,000 --> 00:30:29,000

and for further measure, they then continue on their route using an old-fashioned magnetic compass.

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00:30:30,000 --> 00:30:37,000

But the failed gyro compass on the willowy doesn't explain why the four other ships are reportedly spinning.

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00:30:38,000 --> 00:30:45,000

Could a startling new discovery in the area they are sailing in hold the key to unlocking this mystery?

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00:30:45,000 --> 00:30:52,000

The South Atlantic, where the willowy and four other ships are at risk from a looming menace,

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00:30:53,000 --> 00:30:57,000

one that's hidden from view but growing by the day.

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00:30:58,000 --> 00:31:05,000

The planet and everyone on it is protected from the sun's deadly radiation by the Earth's magnetic field.

278

00:31:06,000 --> 00:31:14,000

The planet and everyone on it is protected from the sun's deadly radiation by the Earth's magnetic field.

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00:31:15,000 --> 00:31:20,000

But scientists have detected a localised weakening of this vital shield.

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00:31:21,000 --> 00:31:23,000

It's called the South Atlantic Anomaly.

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00:31:24,000 --> 00:31:28,000

The South Atlantic Anomaly is an anomaly over the South Atlantic but in space.

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00:31:29,000 --> 00:31:34,000

The anomaly allows the sun's radiation to penetrate deeper into the Earth's atmosphere.

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00:31:35,000 --> 00:31:42,000

Between Chile and Zimbabwe, the Earth's protective shield has deteriorated 6% in just 50 years.

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00:31:43,000 --> 00:31:48,000

And the ships reported to be spinning are located directly below.

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00:31:49,000 --> 00:31:55,000

Could the extra radiation leaking into our atmosphere be affecting their navigation?

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00:31:56,000 --> 00:32:03,000

Above the regions of the South Atlantic Anomaly we can have some problems with maybe detection of the signals from the satellite, accuracy of the signals.

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00:32:04,000 --> 00:32:08,000

And that's because the medium between the ground and the satellite has been affected.

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00:32:09,000 --> 00:32:14,000

It's not out of the realm of possibility that this could have affected the ships near the willow-y.

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00:32:15,000 --> 00:32:23,000

And this growing dent in the Earth's magnetic field could be a sign of something potentially catastrophic for the planet.

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00:32:24,000 --> 00:32:32,000

Collapses of the Earth's magnetic field would basically allow all the radiation which is ejected from the sun to hit the surface of the Earth without any form of defence.

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00:32:33,000 --> 00:32:35,000

Without it, we're doomed.

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00:32:35,000 --> 00:32:36,000

Stat simple.

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00:32:44,000 --> 00:32:50,000

Deep below the surface of the Pacific Ocean, a radioactive mystery is unfolding.

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00:32:51,000 --> 00:32:57,000

Throughout recent history, the testing of nuclear weapons by the world's superpowers has been shrouded in secrecy.

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00:32:58,000 --> 00:33:09,000

But scientists are now discovering strange deep-sea creatures and hidden inside them explosive secrets from the world's nuclear past.

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00:33:11,000 --> 00:33:17,000

2019, do scientists find in some of the deepest parts of the Pacific Ocean something unusual?

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00:33:18,000 --> 00:33:20,000

These are huge.

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00:33:21,000 --> 00:33:28,000

The scientists observe that the amphibons that are living in the deep water are much larger than what you see in shallower water.

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00:33:29,000 --> 00:33:33,000

And their freakish size is not the most bizarre discovery.

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00:33:34,000 --> 00:33:36,000

They're flooded with radiation.

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00:33:37,000 --> 00:33:42,000

How can these creatures, dwelling in one of the most remote places on Earth, be radioactive?

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00:33:43,000 --> 00:33:54,000

Between 1946 and 1958, the United States runs numerous nuclear tests in the Marshall Islands and the Pacific.

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00:33:55,000 --> 00:34:07,000

As the Cold War escalates and fears for American security intensify, scientists test nuclear weapons for use against the Soviet Union over and over in the South Pacific.

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00:34:08,000 --> 00:34:14,000

They fundamentally believe that the biggest possible bang is the biggest possible deterrent.

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00:34:15,000 --> 00:34:22,000

It should have taken centuries for our ocean currents to carry this nuclear fallout to the deepest marine trenches.

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00:34:23,000 --> 00:34:27,000

But it turns out the radiation has spread much more quickly.

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00:34:28,000 --> 00:34:33,000

Radioactive carbon is now making its way into the marine food chain.

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00:34:33,000 --> 00:34:41,000

Science has revealed that organisms at the sea's surface have been ingesting this so-called bomb carbon since the 1950s.

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00:34:42,000 --> 00:34:50,000

And the organic matter from these surface organisms falls to the deepest seabeds, where creatures like amphipods consume it.

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00:34:52,000 --> 00:34:58,000

It's evidence that the Cold War nuclear fallout could now be in every corner of our oceans.

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00:34:58,000 --> 00:35:05,000

But whether radioactive material is the reason behind the amphipods' extraordinary size is contested.

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00:35:06,000 --> 00:35:11,000

Size difference could be for a few different reasons, and it may not be affecting them in any way.

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00:35:13,000 --> 00:35:20,000

In 1963, the nuclear testing that created so-called radioactive amphipods comes to an end.

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00:35:21,000 --> 00:35:36,000

But 60 years later on the other side of the world, a discovery from deep under the Arctic ice sheet reveals another secret part of America's nuclear operations.

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00:35:39,000 --> 00:35:47,000

In 2019 at the University of Vermont, climate scientist Drew Christ makes a life-changing discovery.

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00:35:48,000 --> 00:35:54,000

For me, as a climate scientist, receiving these samples in the lab was like holding the Holy Grail.

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00:35:55,000 --> 00:36:00,000

It's the remains of an ice core drilled from deep within Greenland's ice sheet.

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00:36:00,000 --> 00:36:07,000

An ice core is actually a tube of ice which contains in it sediments and bits of rock.

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00:36:07,000 --> 00:36:10,000

And this one has a very peculiar history.

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00:36:11,000 --> 00:36:19,000

What's so unusual about this particular ice core is that it bounced around between various research institutes around the world over a number of years.

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00:36:20,000 --> 00:36:28,000

They were in these scientific cookie jars that had these old labels that were written that said Camp Century sub-ice on them.

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00:36:29,000 --> 00:36:34,000

Camp Century was an American military research base in Northern Greenland.

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00:36:34,000 --> 00:36:38,000

But until recently, its operations have been failed in secrecy.

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00:36:40,000 --> 00:36:48,000

What was its true purpose? And what is the significance of the mysterious ice core taken from deep beneath the camp?

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00:36:49,000 --> 00:36:56,000

The fact that this has been going around for nearly 40 years and people haven't realized what it was...

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00:36:58,000 --> 00:36:59,000

...is mind-blowing.

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00:37:10,000 --> 00:37:19,000

It's the height of the Cold War and the two great adversaries, America and Russia, are separated by only two and a half miles at the narrowest point.

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00:37:20,000 --> 00:37:29,000

This threat leads the US Army to undertake one of its most secretive missions, 25 feet under the Greenland ice sheet.

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00:37:30,000 --> 00:37:38,000

What does this mysterious place deep below the frozen water reveal about America's secret nuclear past?

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00:37:39,000 --> 00:37:42,000

And surprisingly, the future of our planet.

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00:37:44,000 --> 00:37:49,000

The background to this story is very weird and kind of like science fiction.

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00:37:49,000 --> 00:37:59,000

Imagine a network of 21 tonnes with a total length of nearly two miles underneath Greenland's ice, all powered by a nuclear reactor.

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00:38:00,000 --> 00:38:02,000

To the public, it's a climate research base.

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00:38:03,000 --> 00:38:09,000

But Camp Century is actually the location of a top secret initiative called Project Iceworm,

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00:38:09,000 --> 00:38:22,000

whose goal is to establish a missile launch site within easy striking range of the Soviet Union, all hidden beneath the ice, and capable of unleashing 600 nuclear warheads.

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00:38:24,000 --> 00:38:26,000

How did they go about that?

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00:38:27,000 --> 00:38:32,000

They didn't understand the fundamental properties of the ice.

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00:38:32,000 --> 00:38:41,000

So they went there and funded a lot of really incredible science to study what ice does, how it behaves.

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00:38:42,000 --> 00:38:46,000

To do this, they drill a mile down deep into the Greenland ice sheet.

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00:38:47,000 --> 00:38:52,000

They recovered all these cylinders of ice in about 1.5 metre long segments.

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00:38:53,000 --> 00:38:58,000

And what they learn forces them to abandon their hopes for a missile launching base.

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00:38:59,000 --> 00:39:08,000

The problem is, ice is really not very stable. It changes, it warms up, it melts, it solidifies.

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00:39:09,000 --> 00:39:18,000

And it's a really bad thing to put nuclear missiles on an unstable ice surface that can move around potentially damaging those missiles.

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00:39:19,000 --> 00:39:26,000

With the added weight of falling snow, tunnels that start as 20 feet wide slowly collapse.

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00:39:26,000 --> 00:39:34,000

Sort of like when the walls in the trash compactor scene in Star Wars happens. Slowly over time it started to compress in.

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00:39:35,000 --> 00:39:42,000

But with the end of the Cold War, America's need for a missile site at Camp Century comes to an abrupt halt.

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00:39:43,000 --> 00:39:53,000

But 60 years later, the discovery of the long missing Camp Century ice core warns of a new and potentially more devastating threat.

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00:39:53,000 --> 00:39:56,000

What else is to be revealed about this top secret base?

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00:39:57,000 --> 00:40:04,000

Using advanced analytical techniques, Drew probes the sediment at the bottom of the Camp Century ice core.

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00:40:05,000 --> 00:40:16,000

Ice cores record history. They give us a little stamp on what was happening in the atmosphere and the environment at a given time in the past.

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00:40:17,000 --> 00:40:21,000

The further down you drill into the ice, the further back in time you're going.

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00:40:21,000 --> 00:40:27,000

What Drew finds at the bottom of this time capsule is truly mind blowing.

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00:40:29,000 --> 00:40:36,000

It was one of the Eureka moments. I thought that that didn't happen to scientists. I thought that was just something that happened in movies.

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00:40:37,000 --> 00:40:44,000

In the sediment are traces of plant fossils, proving that within the last million years, Greenland was once ice free.

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00:40:45,000 --> 00:40:53,000

For the first time, we saw just how dynamic Earth's climate can be and how quickly it could change.

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00:40:54,000 --> 00:40:57,000

We knew that this was a new chapter in the story of Camp Century.

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00:40:58,000 --> 00:41:04,000

This discovery proves that Greenland is more susceptible to climate change than we previously thought.

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00:41:05,000 --> 00:41:10,000

It's not a case of if the ice sheet is melting, but how fast?

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00:41:11,000 --> 00:41:19,000

The ice core exposes a very real threat to all those people who live along the coasts of the world's oceans.

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00:41:20,000 --> 00:41:25,000

It's a massive store of frozen water that can raise sea level as much as seven meters.

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00:41:28,000 --> 00:41:35,000

As a scientist, this sort of information is really fascinating, but of course as a citizen and a human living on this planet, it's horrifying.

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00:41:35,000 --> 00:41:48,000

All this from the scientific analysis of a long forgotten ice core sample and the discovery of the microscopic evidence hidden inside.

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00:41:49,000 --> 00:41:54,000

Camp Century has been invaluable for science, but not in the way that it was intended.

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00:41:55,000 --> 00:42:02,000

The legacy of US nuclear ambitions in Greenland reveals a critical and unexpected truth about our oceans.

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00:42:02,000 --> 00:42:08,000

One that may help scientists help us combat the threat of climate change.