1
00:00:00,000 --> 00:00:04,000
Ice.

2
00:00:04,000 --> 00:00:08,000
You might know that ice plays significant part in climate change.\h

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00:00:08,000 --> 00:00:12,000
But what about how scientists study it?

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00:00:12,000 --> 00:00:16,000
The first satellite solely dedicated to collecting information on the world’s ice\h

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was the Ice, Cloud, and land Elevation Satellite, better known

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00:00:20,000 --> 00:00:24,000
as ICESat.\hBut back in 2009,\h

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00:00:24,000 --> 00:00:28,000
ICESat was decommissioned, and ICESat-2 didn’t launch until nearly

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a decade later in 2018. So how did we study ice in the meantime?\h

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00:00:32,000 --> 00:00:36,000
Enter Operation IceBridge.

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00:00:36,000 --> 00:00:40,000
NASA’s Operation IceBridge was created to quite literally bridge

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00:00:40,000 --> 00:00:44,000
the gap in data collection between satellites, and it’s the largest

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00:00:44,000 --> 00:00:48,000
airborne survey of Earth's polar ice ever.\h

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

After 11 years of providing invaluable yearly measurements from both poles,\h

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00:00:52,000 --> 00:00:56,000
surveying glaciers, ice sheets, and sea ice, most of IceBridge came to\h

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a close. However, one small part of the mission

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still continues in 2020 -- Operation IceBridge

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Alaska.\hA team of scientists from the University

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00:01:08,000 --> 00:01:12,000
of Alaska Fairbanks studies and records the annual changes in Alaska’s

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ice thickness. They do so through a remarkable aircraft.\h

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specially retrofitted for science. By shooting a laser

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out of the bottom of the plane that hits the glacier’s surface and bounces back up,

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00:01:24,000 --> 00:01:28,000
scientists can measure the surface elevation.\hAnd using ice-penetrating

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00:01:28,000 --> 00:01:32,000
radar, they can measure the bedrock below the glacier, and come up with

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00:01:32,000 --> 00:01:36,000
an estimate of ice thickness. But the field missions in Alaska

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00:01:36,000 --> 00:01:40,000
face especially challenging circumstances. In order

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00:01:40,000 --> 00:01:44,000
to measure glaciers within data collection lines, the plane must be flown

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00:01:44,000 --> 00:01:48,000
very low while navigating around extremely tricky mountain ranges,

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00:01:48,000 --> 00:01:52,000
making for some of the most adventurous mission flying around.

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00:01:52,000 --> 00:01:56,000
Even the glaciers themselves have proven to be a challenge to scientists.\h

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Most glaciers in Alaska are temperate, meaning

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00:02:00,000 --> 00:02:04,000
they’re at their melting point from surface to base, and contain large pockets

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00:02:04,000 --> 00:02:08,000
of water within the ice. Those pools of water muddle the

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00:02:08,000 --> 00:02:12,000
radar signals, making it difficult to collect consistent measurements of

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00:02:12,000 --> 00:02:16,000
thickness. And these measurements recorded are vital.

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Alaskan glaciers make up only a small percentage of the world’s ice,\h

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00:02:20,000 --> 00:02:24,000
but they contribute a disproportionately large amount to sea level rise.

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00:02:24,000 --> 00:02:28,000
The research and data collection done\h

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00:02:28,000 --> 00:02:32,000

under Operation IceBridge helps give scientists a closer look at the

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00:02:32,000 --> 00:02:36,000
connections between mountain glaciers and global climate change.