



1
00:00:00,060 --> 00:00:04,240

[chimes]

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00:00:08,290 --> 00:00:12,340

My name's Bryan Blair, I'm an instrument scientist in the

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00:00:12,360 --> 00:00:16,430

laser remote sensing laboratory at Goddard.

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00:00:16,450 --> 00:00:20,640

LVIS is a high altitude, laser swath

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00:00:20,660 --> 00:00:24,820

mapping system, so it's designed to measure the surface of the Earth.

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00:00:24,840 --> 00:00:28,960

So whether it's the topography, the elevations,

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00:00:28,980 --> 00:00:33,090

of the surface, or the structure of vegetation, or the

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00:00:33,110 --> 00:00:37,140

changes that are happening to the surface, whether they're subtle changes

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00:00:37,160 --> 00:00:41,220

for example, volcanic sources, underground magma chambers, or

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00:00:41,240 --> 00:00:45,280

very dynamic surfaces like glaciers, for example,

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00:00:45,300 --> 00:00:49,330

so it's a unique capability because we can map

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00:00:49,350 --> 00:00:53,510

incredibly large areas from a high altitude aircraft

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00:00:53,530 --> 00:00:57,690

so we can map actually, we are getting to the point where we can map

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00:00:57,710 --> 00:01:01,880

an entire nation with a laser system, so it's quite good.

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00:01:01,900 --> 00:01:06,060

For IceBridge,

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00:01:06,080 --> 00:01:10,260

there was a number of goals of IceBridge.

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00:01:10,280 --> 00:01:14,320

Namely, to keep track of what changes were happening

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00:01:14,340 --> 00:01:18,360

to the ice sheets in between the two ICESat missions, ICESat one and ICESat-2,

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00:01:18,380 --> 00:01:22,500

so we actually get out there on a yearly basis and monitor the

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00:01:22,520 --> 00:01:26,630

changes. And then there was a more long-term goal,

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00:01:26,650 --> 00:01:30,650

which would be to help tie those two satellite missions together.

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00:01:30,670 --> 00:01:34,730

So in one aspect you'd be looking at individual

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00:01:34,750 --> 00:01:38,800

glaciers and in the other you'd actually be trying to lay out large grid patterns

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00:01:38,820 --> 00:01:42,850

all over Greenland so that you could look at the changes over

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00:01:42,870 --> 00:01:46,900

ten or twenty years. And it would contribute to that. So what LVIS brings,

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00:01:46,920 --> 00:01:51,080

uniquely, is the ability to cover enormous

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00:01:51,100 --> 00:01:55,190

areas very cost effectively.

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00:01:55,210 --> 00:01:59,390

What we've been doing so far with IceBridge is going back at a

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00:01:59,410 --> 00:02:03,560

a stable time in the ice sheets. In the spring for example in Greenland we

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00:02:03,580 --> 00:02:07,770

go in the March April May time period because the

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00:02:07,790 --> 00:02:11,950

drastic changes, the seasonal melt, the accumulation

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00:02:11,970 --> 00:02:16,110

from the winter have sort of stabilized, so we can go back once a year

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00:02:16,130 --> 00:02:20,260

and look at those long term trends in those ice sheets.

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00:02:20,280 --> 00:02:24,420

So what we're doing this fall, we're going to see a six-month

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00:02:24,440 --> 00:02:28,540

change. And that six-month change is more related to those seasonal effects.

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00:02:28,560 --> 00:02:32,670

The summer melt that's been occurring. So we can go in

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00:02:32,690 --> 00:02:36,780

there and look at glaciers and some of the interior of the ice sheets

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00:02:36,800 --> 00:02:40,870

and see how much melt has occurred.

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00:02:40,890 --> 00:02:44,930

And with LVIS and all the spring mapping that we did we'll be able to look

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00:02:44,950 --> 00:02:48,960

at that change over large areas.

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00:02:48,980 --> 00:02:53,020

One of the really unique technologies about LVIS is

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00:02:53,040 --> 00:02:57,200

there's some optical limitations to telescopes. So a telescope can only be

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00:02:57,220 --> 00:03:01,390

so large, collect so much light, and see

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00:03:01,410 --> 00:03:05,420

so big of an angular field of view. So with LVIS,

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00:03:05,440 --> 00:03:09,600

we actually have a mechanical, a very unique lightweight scanning system

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00:03:09,620 --> 00:03:13,790

that actually scans the field of view of the telescope as constantly as we're flying along,

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00:03:13,810 --> 00:03:17,980

so it's actually sweeping back and forth about 10 or 20 times

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00:03:18,000 --> 00:03:22,190

a second. And then within that field of view we're scanning our laser very

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00:03:22,210 --> 00:03:26,360

quickly to make that full images. So it's a really, it's a unique

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00:03:26,380 --> 00:03:30,540

technology that allows us to have a large telescope which you need to be able to

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00:03:30,560 --> 00:03:34,720

collect all the photons and the reflected light from the surface, efficiently,

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00:03:34,740 --> 00:03:38,830

so it's a large collecting area, with a large

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00:03:38,850 --> 00:03:42,900

field of view.

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00:03:42,920 --> 00:03:46,970

NASA Wallops Flight Facility has recently acquired a C-130

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00:03:46,990 --> 00:03:51,030

aircraft. It's a large, turboprop aircraft.

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00:03:51,050 --> 00:03:55,070

It can fly at 30,000 feet, it has pretty good endurance, so that what

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00:03:55,090 --> 00:03:59,250

we're going to put LVIS on - the two LVISes on - this year.

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00:03:59,270 --> 00:04:03,430

There's a lot of capacity of this aircraft. You could actually fly quite a number of instruments

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00:04:03,450 --> 00:04:07,610

and we'll be the first to use it for NASA.