Field Script #3

Mapping Ice with Airborne Lasers

VIDEO SCRIPT

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| Standup, outside in the hills – | “Out here, at human scale, altitude mostly has to do with your senses. Our research outpost is down there (point down to town). The top of the mountain is up there. But from NASA’s research aircraft the P-3B Orion, things need to be a little more precise. |
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|  | Measurements of polar ice require accuracy and detail, year over year. Here we see the results of those measurements as different velocities of ice sliding off the land. |
| Seated next to Jim on the plane at the ATM station | That’s what keeps this guy busy. |
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| Soundbite Jim Youngel – ATM Project Manager | The Airborne Topographic Mappers, or two lidar systems onboard, create elevation maps of the surface that we're flying over. We do that by firing three thousand pulses of laser light every second from the aircraft to the ground and back again. We time each laser pulse so we know each transit time, from the time it leaves the aircraft to the time it hits the ground and comes back to the aircraft again. |
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| Can we do a kitchen-oriented stop action animation? | Since we know the speed of light through air, those transit times give us the distance from the airplane to the surface of the Earth. |
| Standup, using one hand gesturing sideways to indicate the airplane flying and being buffeted by winds as it flies over Earth | But more accurately, the system *really measures* the distance from the airplane to a known global positioning reference point. That lets Jim measure ice height relative to itself, rather than to the plane’s arbitrary distance from the ice. |
| Cut to standup, off angle, ultra wide (try it with a snap turn of the head ☺ ) | Tough stuff: don’t get stuck. |
|  | The science of measurements around an idealized planetary shape is called Geodesy, and it’s definitely a subject for another day. |
|  | IceBridge uses laser altimetry to help determine if ice quantities are growing or shrinking. |
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|  | But change over time requires accurate measurements over time. That’s why it’s essential for the Airborne Topographical Mapper team to do what they do, consistently and as accurately as possible. By comparing measurements year to year to year, scientists can monitor change. Only then can other instruments teams collaborate to understand why ice may be building up or melting away. |
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