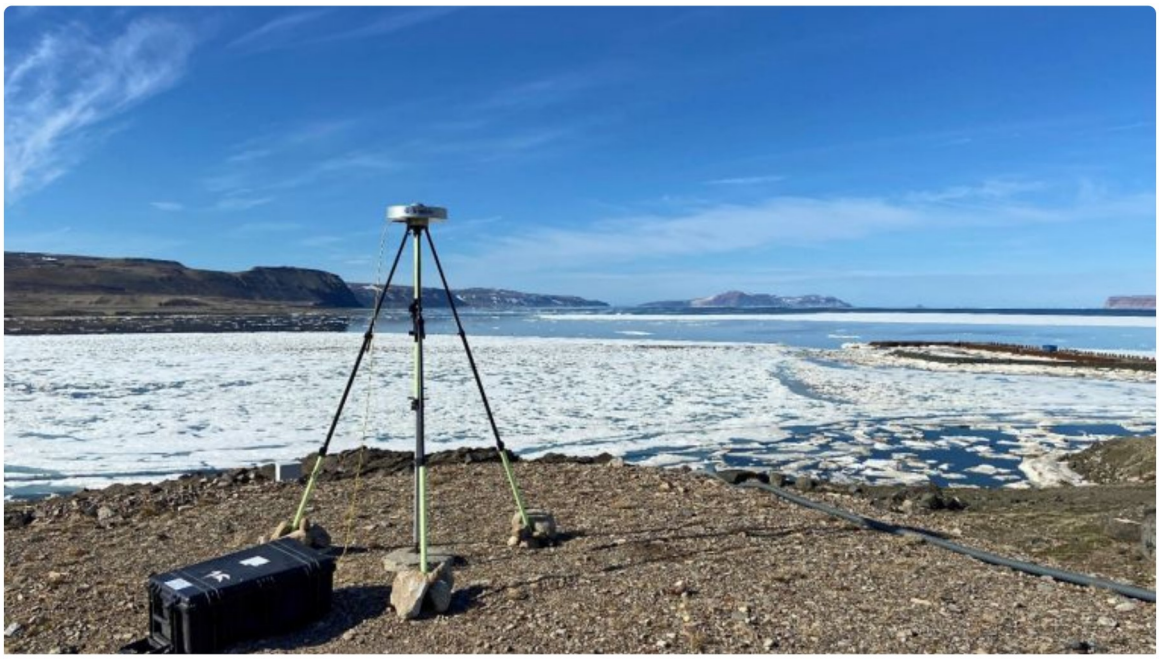

NEWS

Using Airborne Lidar Technology to Map Greenland Arctic Summer Sea Ice

September 5, 2022

Researchers from the Bureau of Economic Geology have spent the summer in northwestern Greenland conducting research using an airborne Lidar

Greenland Arctic summer sea ice heights and bathymetry

of cryospheric melt ponds – is sponsored by NASA and being carried out by Kutalmis Saylam, Aaron Averett and John Andrews. The focus of the project is to help to determine the thickness of sea ice during the warmer summer months.

High-altitude and Lower-altitude Lidar Mapping

The NASA satellite ICESat-2, launched in September 2018, uses a green-wavelength beam to measure the thickness of sea ice from orbit. However, it is difficult to detect the size and depth of shallow melt ponds that appear on the sea ice every summer. Using NASA's Gulfstream V research aircraft, NASA and the Bureau are using state-of-the-art airborne laser altimeters to confirm the satellite measurements and to help improve algorithms predicting sea ice thickness and melt pond depths in the upcoming years.

Alongside NASA's Land, Vegetation and Ice Sensor (LVIS) high-altitude Lidar system, Bureau researchers are using a Leica Chiroptera 4X airborne Lidar system at lower altitudes. The Chiroptera 4X emits beams from two channels: a near-infrared wavelength that can detect hard surfaces and the water's surface, and a green wavelength that penetrates into the water column to measure depth. The Chiroptera's Lidar sensors are coupled with a high-resolution, four-band camera that captures the details of target surfaces simultaneously with Lidar data acquisition.

A GPS base station set up by the Bureau of Economic Geology researchers.

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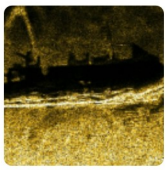

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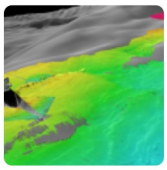

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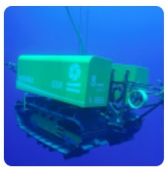

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