NASA SnowEx 2023 Tundra and Boreal Forest Field Campaign in Alaska, U.S.

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ABSTRACT

NASA's SnowEx was initiated by the Terrestrial Hydrology Program in 2017 to study snow remote sensing challenges in different environments in preparation for a future snow mission opportunity. The specific focus of SnowEx is on testing and maturing technology for satellite remote sensing of global snow water equivalent (SWE) and albedo. Over the 2022-2023 winter, SnowEx an airborne and ground-based snow campaign was conducted in Alaska to address SWE, snow depth and albedo measurement questions unique to taiga and tundra snowpacks. Four sites were selected in Interior Alaska, a boreal forest environment with discontinuous permafrost and seasonal taiga snowpack. Two sites were located on the North Slope of Alaska, a region dominated by low-stature land cover, tundra snowpack, and continuous permafrost. A suite of airborne and ground-based validation activities in fall 2022 and spring 2023 were conducted to quantify and compare the capabilities of radar, altimetry and multispectral sensors to measure SWE and snow depth during the winter season and albedo during the spring melt period. The SnowEx field campaign will provide snow datasets in support of testing and advancement of remote sensing, modeling, and measurements techniques needed for the development of global SWE products. This presentation will provide an overview of this winter's field and airborne activities in Alaska and a summary of the data collected.

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Fig. 1. Snow measurements being made at the Upper Kuparuk-Toolik tundra site during the March SnowEx 2023 campaign, Photo credit: Svetlana Stuefer.