

## Stories from the Field: NASA's SnowEx Campaign in the Upper Colorado

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Seasonal snow on earth is critically important globally for management of water resources, natural hazards, water security, and weather applications. The only practical way to observe the quantity of snow on a global scale is through satellites—i.e., a snow satellite mission. Yet, current techniques underestimate snow water equivalent (SWE) by as much as 50%, and model-based estimates have their own list of issues. Confounding these is the fact that forests hinder SWE measurement for as much as half of snow-covered terrestrial areas. So, understanding forest effects on snow observing is important for planning a future snow satellite mission. The consensus in the snow remote sensing community is that a multi-sensor approach is needed (combined with modeling to fill the gaps in space and time) because no single type of sensor is ideal under all conditions. What remains, then, is how best to combine and use the various sensors and models under different types of snow conditions and confounding factors.

NASA's SnowEx airborne campaign is designed to collect the measurements needed to determine the best combination of sensors and models to observe global snow. Year 1 (2016-17) focused on the distribution of snow-water equivalent (SWE) and the snow energy balance in a forested environment. The Year 1 sites were Grand Mesa and the Senator Beck Basin, both in the Upper Colorado River Basin.

This paper will describe the SnowEx Year 1 campaign, particularly the Feb 2017 deployment. Ground-based remote sensing and in situ data collection involved nearly 100 participants over three weeks, while the airborne campaign included nine sensors on five aircraft. The reasons for selecting these sites, the surprises provided by Mother Nature, and how we attempted to adjust, will be discussed.

Oral preferred.

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