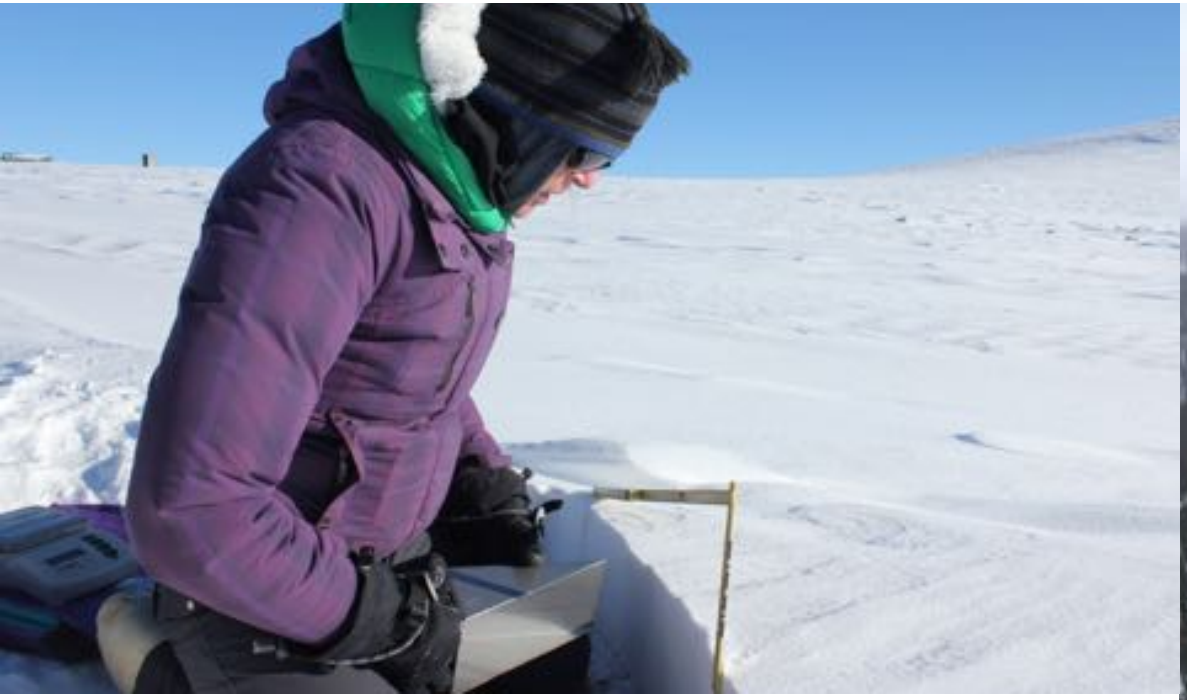


SnowEx-ABoVE Coordinated Airborne Science Campaign

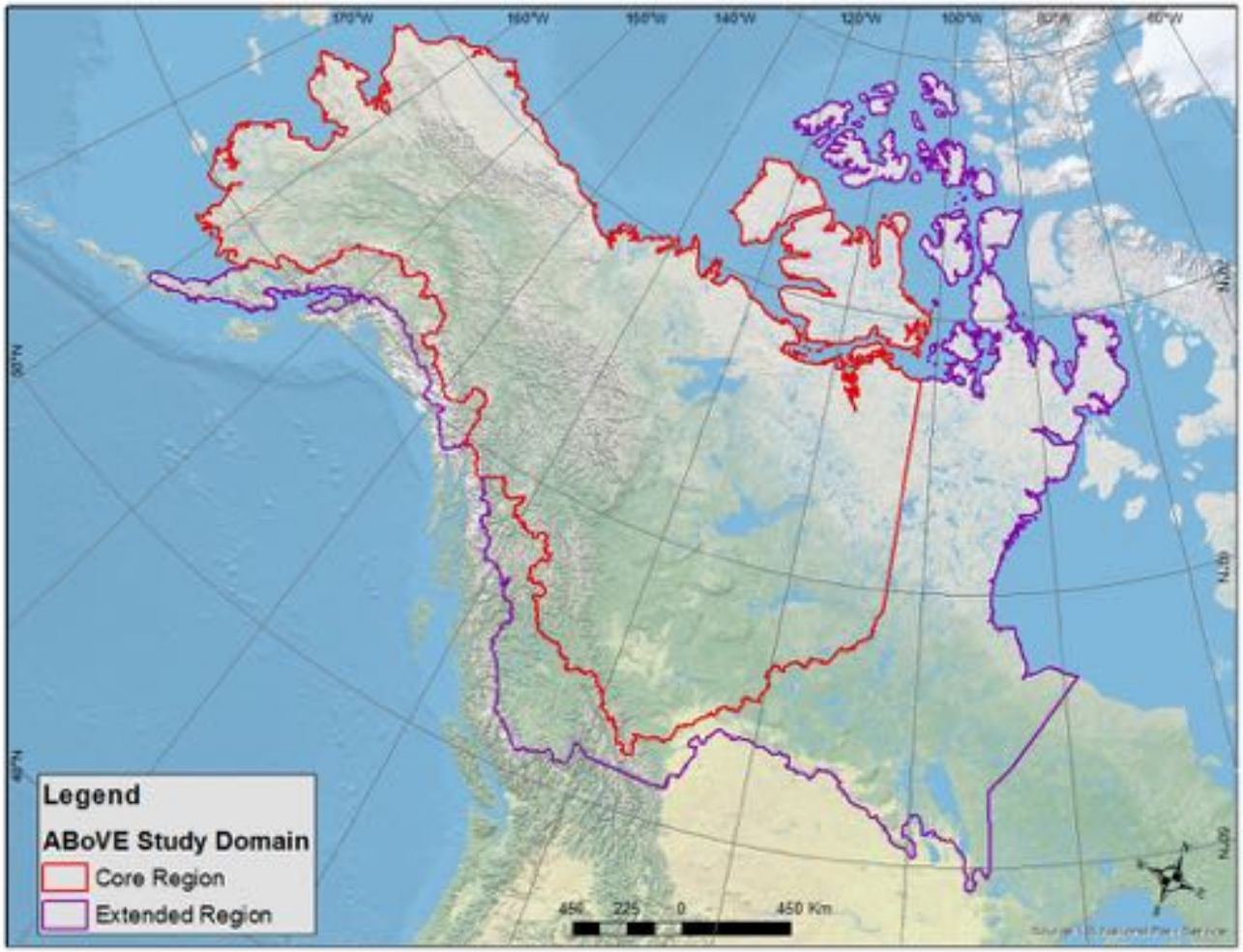
SnowEx Goal: Fill key gaps in snow retrieval performance

- Need to quantify retrievals of SWE, albedo, and depth and to a lesser extent, snow properties such as density and melt status

It is important to be able to do this across all snow climates including the Arctic boreal region (ABR)

In what ways can SnowEx benefit from ABoVE?

Location



The region provides the opportunity to test snow remote sensing techniques over tundra and boreal forest, across topographic gradients, and for heterogeneous land surface types (lakes, wetlands, permafrost, etc.)

The ABoVE domain in Alaska and Yukon represents a key global snow climate.

Data

SnowEx can leverage data that ABoVE has already acquired including extensive airborne and ground based data.

After conducting a census of what is already available in terms of ancillary data and ongoing monitoring, it should be possible to leverage existing data/resources/facilities to target and fill SnowEx data gaps

ABoVE data management serves as good example and SnowEx can potentially reduce data management costs through cost-sharing.

Logistics

ABoVE has demonstrated success in carrying out complex field campaigns including airborne and terrestrial remote sensing, and in *situ* measurements;

The ABoVE logistics office in Fairbanks provides excellent support to scientists in the field.

User Communities

A SnowEx-ABoVE collaboration will extend and strengthen the user base for a snow remote sensing mission.

ABoVE scientists have expressed the need for snow information to augment their terrestrial ecology questions.

[see Mahoney et al. 2018]

SnowEx-ABoVE 2019-2020 Coordinated Airborne Science Campaign

SnowEx goal: Fill key gaps in snow retrieval performance. The Arctic boreal region represents the tundra and taiga snow climates that remain incompletely addressed by SnowEx.

Remote sensing objectives:

- Quantify retrievals of SWE, albedo, depth, and melt status over heterogeneous tundra and boreal forest landscapes
- Understand and quantify uncertainties, ancillary data requirements, synergies and limitations of snow remote sensing methods

Tasks and Timeline

Aug 2018: Draft lists of desired site characteristics, sensing techniques, & ground truth

Sept 2018: Perform a census of what is already available, what is needed, and then identify the gaps and match them to specific remote sensing requirements

Sept 2018: Identify candidate ABoVE forest & tundra sites, plus some of our 'own'; leverage ABoVE infrastructure; 'reserve' aircraft and sensors; compare our list of measurement w/ABoVE's

Oct/Nov 2018: Consider site visits to firm up the site list; start prepping airborne sensors

Dec 2018/Jan 2019: hiatus

By Feb 2019: Determine if SnowEx needs to find own logistics for any sites; start search if needed

Spring 2019: Possible site visits

Summer 2019: Prep for fall field work; install any needed *in situ* sensors

Aug 2019: Install in situ sensors (before freeze up)

Late-Aug/Sept 2019: Window for fall IOP at tundra site

Sep-Nov 2019: Window for fall IOPs at boreal forest site(s)

Dec 2019-Mar 2020: Winter measurements at all sites; interval & exactly when TBD

Apr-May 2020: Melt season IOP window at boreal forest site(s)

May-Jun 2020: Melt season IOP window at tundra site

Jun-Jul 2020: undeploy *in situ* sensors