

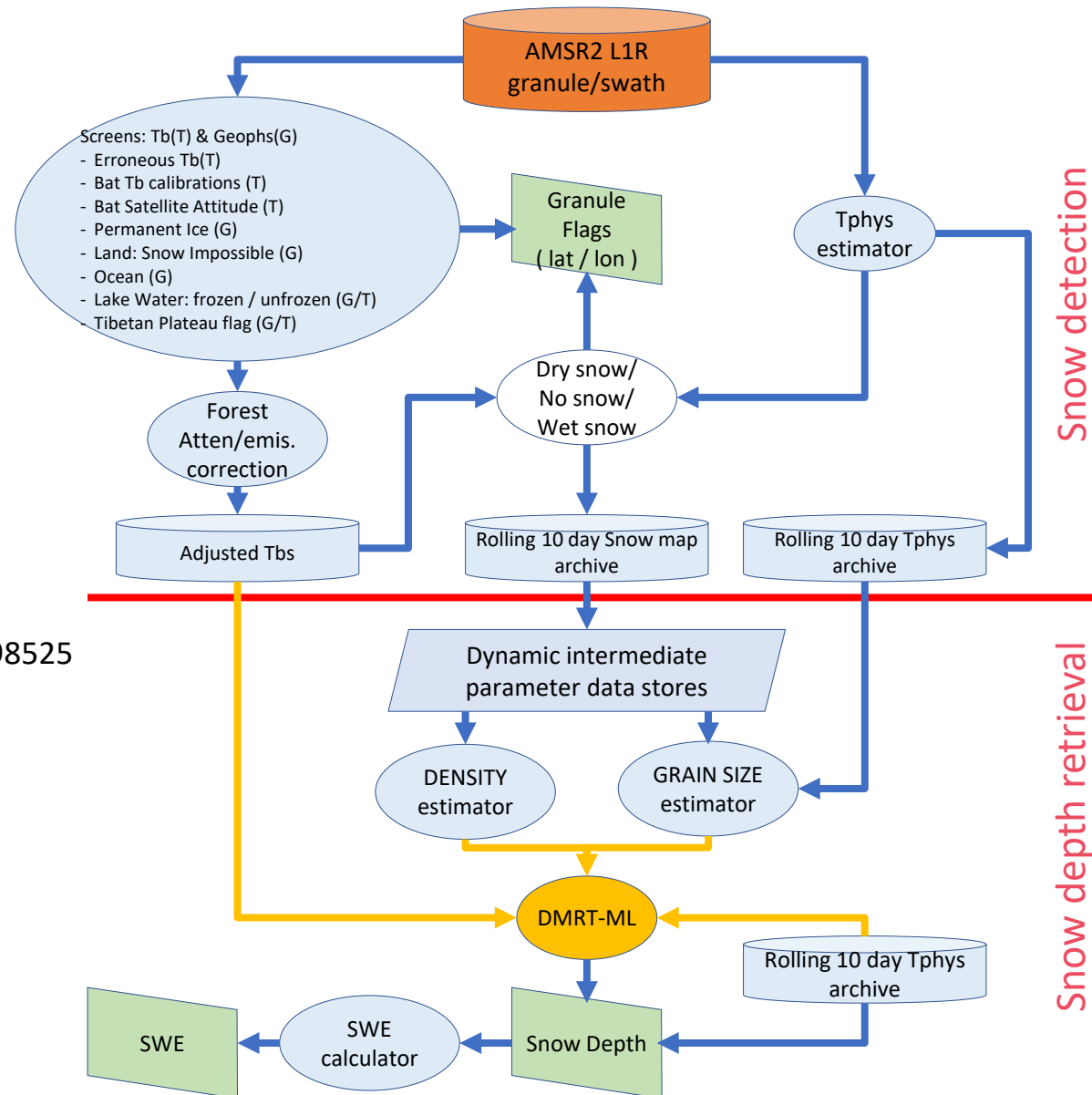
Snow Depth Algorithm

Overview

- **Algorithm :**
The Satellite-based Microwave Snow Algorithm (SMSA) version 3.0
- **Input :**
– AMSR2 L1R (10, 18, 22, 36, 89GHz)
- **Output :**
– Snow Depth (cm)
– Snow Water Equivalent (mm)
- **Reference :**
Richard Kelly et.al. 2019,
<https://doi.org/10.1109/IGARSS.2019.8898525>

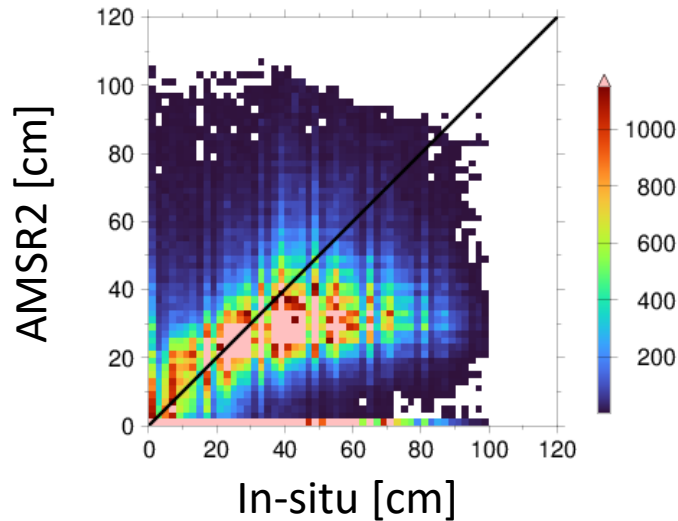
Major Changes in SMSA v3.0

- DMRT-ML (Dense media)
- Grain size and density model
- Improvement of data quality control

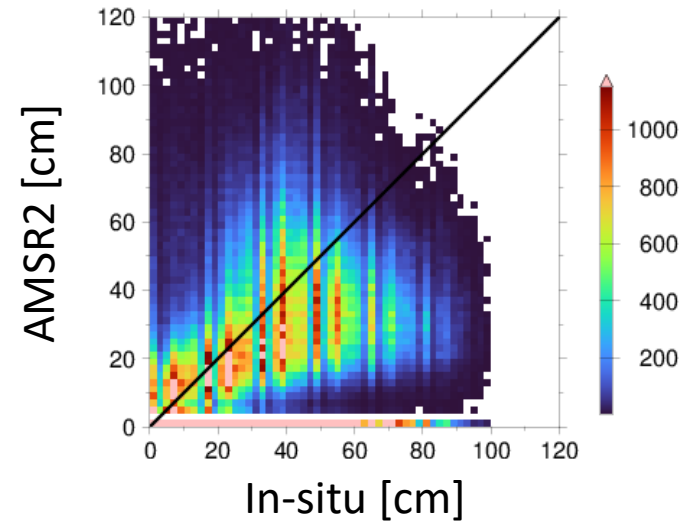


A validation result

Research Product (SMSA v3.0)



Standard Product (v2)



Period: Oct. 2012 – Sep. 2021 (Descending Only)
In-situ: NOAA NCDC Global Surface Summary of the Day (GSOD)

Site Selection

- Water surface coverage within a 15km radius is 5% or less.
- R.M.S. of topography within a 15km radius is less than 100m.
- At least 30 records of snow depth ($SD > 0\text{cm}$) per snow season are available.
- Seasonal maximum snow depth is 40cm or more and 100cm or less ($40\text{cm} \leq SD_{max} \leq 100\text{cm}$)

Match-up method of AMSR2 product (L2) and In-situ data

- The AMSR estimates are from the nearest footprint when the center position of the footprint was within 7km of the target site.
- The in-situ data on the same observation date as AMSR3.



720 sites (2944 site·season)

Unit: cm

	Research(v3.0)	Standard (v2)
Num.	608586	607250
R	0.461	0.346
RMSE	23.505	26.604
Bias	-11.607	-10.131
MAE	17.288	19.922

※Release Accuracy : 20cm