

NASA Community Snow Meeting Day 2 Breakout Session I Final Merged Summary

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This is a designated space for compiled notes from the summary slide presentations. *Only the listed note taker will update this document.* The purpose of this document is to compile unique takeaways presented across all breakout session groups.

“i” represents the amount of times topics were mentioned between groups

Questions:

1. What are the target snow-community science questions to observe snow globally?
 - a. What are the most important remaining science questions (measurement, snow science, data science)?

General consensus on needing SWE, Snow depth, and snow albedo.

How do we get SWE in wet snow? (iiiiii)

It will be more common in the future everywhere

Shallow, low-elevation snowpacks

Snowmelt timing - operations

“High maintenance snow” (wind-blown, complex terrain)

More than radar

How do we balance remote sensing/model connection to fill gaps? (iiii)

What is the accuracy and uncertainty of snow retrievals? (ii)

Is partial SWE ok? - How do we couple partial datasets? (ii)

Snowpack evolution - how do we quantify? (i)

How do snow science data impact other disciplines? (i)

More on canopy interception? (i)

More on sublimation/evap? (i)

- b. What is needed to address and answer these questions?

Context: Cost/benefit analysis between scientists and other users with the feasibility of missions - need good communication.

High temporal resolution (iiii)

Allowing real-time decision-making within response times

Spatially and temporally continuous

Beyond peak SWE - daily retrievals

Top-down thinking / working backward / driven by applicability and problem (iiii)

Review paper- getting a general consensus on what is helpful for different operational users (ii)

Communication between space/air/ground science folks, three-legged stool (i)

Building trust between science and management (i)

2. What are the target science and operational applications?

Water resources (Food and water security) - basin-scale, top-down approach (iiiiii)

Snow as a forecast tool

Climate feedbacks (iii)

Coupling SWE with numerical weather prediction (iii)

Extreme events (iii)

Ecology (ii)

Avalanche/ski/transportation (ii)

Coupling earth system components generally (ii)

Wildfire predictability (i)

3. How are past, current and future satellite missions poised to address snow-related science questions?

a. What are the shortcomings?

Lack of "truth" - need better validation

Fusion approach of partial datasets needed

Spaceborne lidar - any good?

4. What should a future snow mission provide?

Generally no specifics- commonly mentioned:

"High resolution"

Spatiotemporal agility - general consensus and needing these things to be driven by their application (focus on predictability and water/hazard management)

Flexible response times

Maybe need to strike a balance between different missions?

Consistent and spatially and temporally continuous

- a. Temporal repeat?
- b. Spatial resolution?
- c. Accuracy across landscapes/canopy?
- d. Snowpack depth?
- e. Soil moisture co-measurements?
- f. Auxiliary snow density information?
- g. Coverage?
- h. Other considerations?