JULES Snow Module Development

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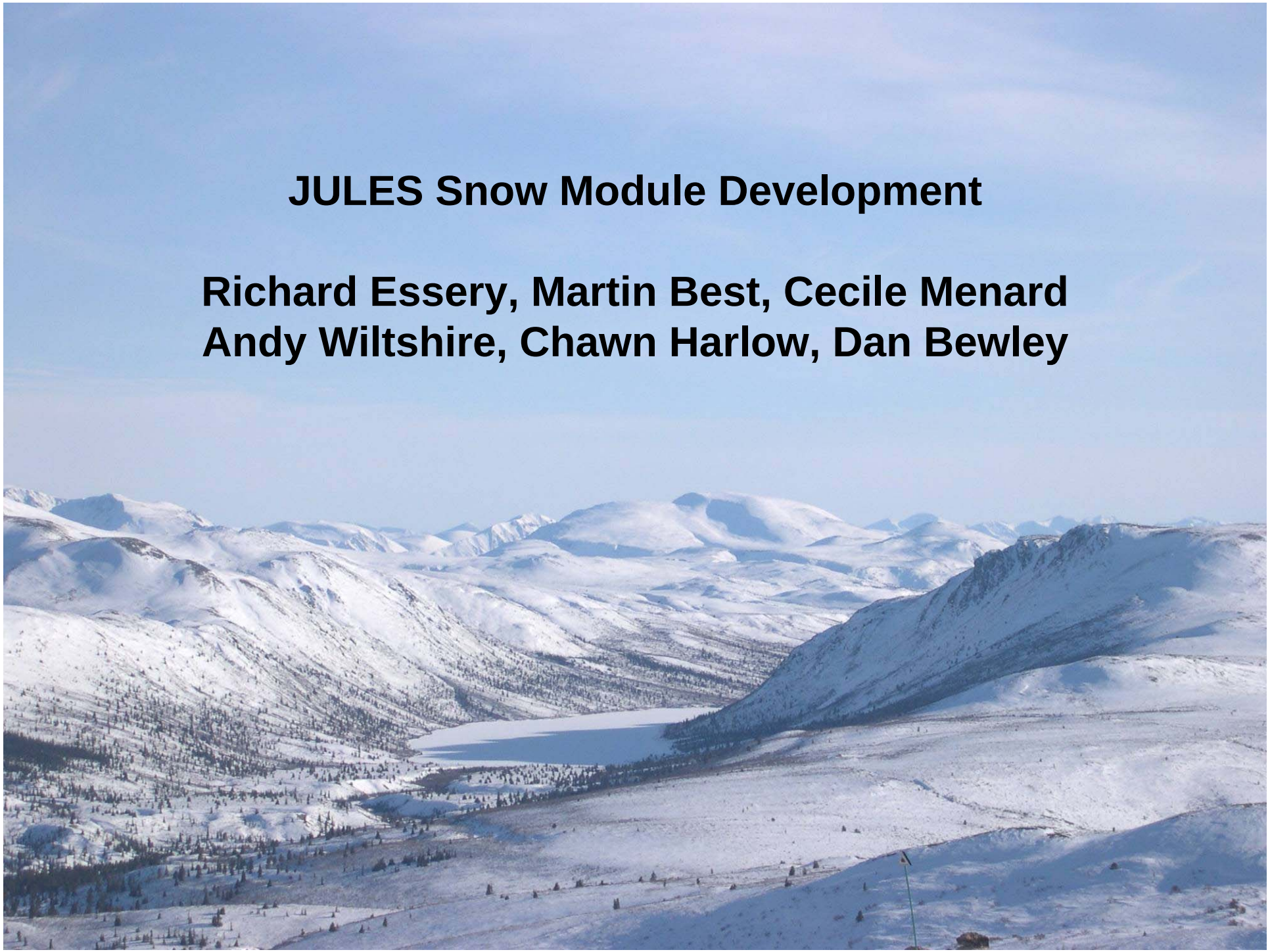


MOSES Snow Model

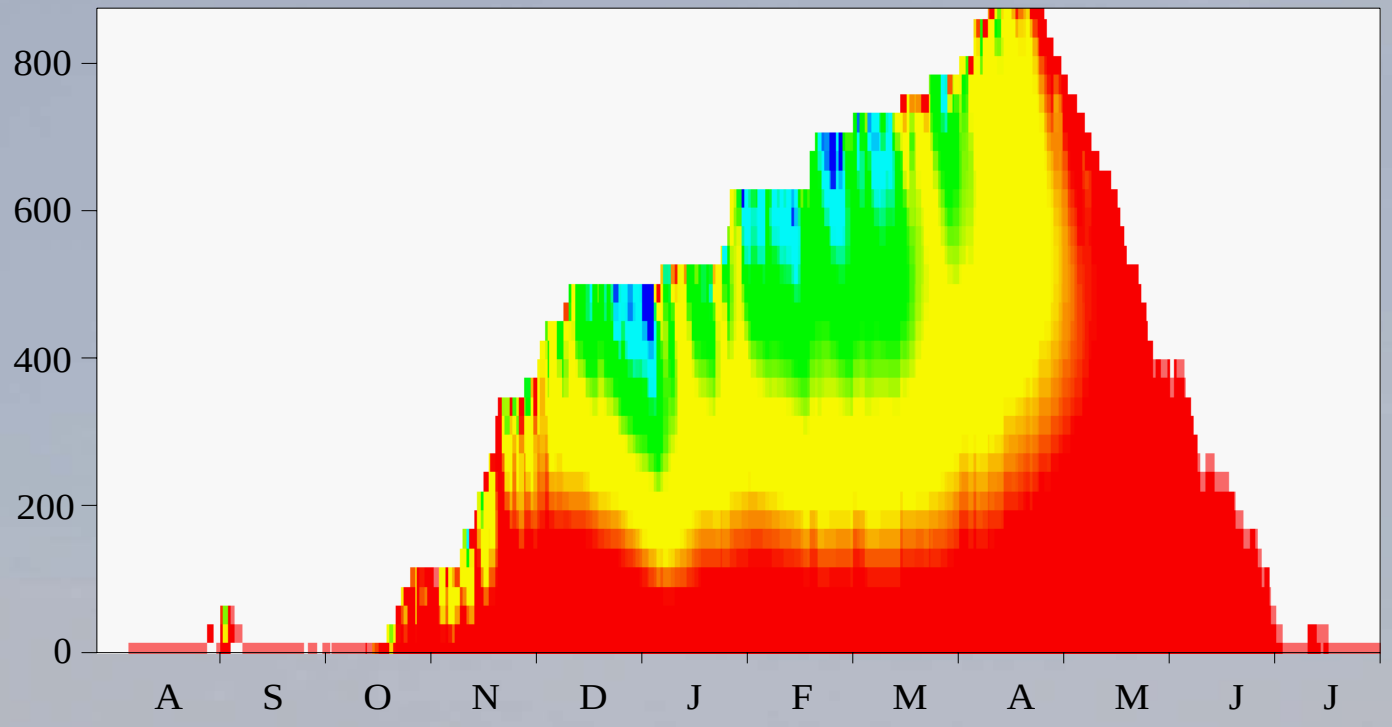
- Single model layer combined with top soil layer
- Combined surface energy balance for snow and snow-free fractions
- Fixed density
- No storage of liquid water
- No refreezing of liquid water
- No partitioning of snowfall between canopy interception and throughfall

JULES: point or gridbox model?

Vertical model development:
- Multi-layer snow model (Martin)
- Microwave emission modelling (Chawn)
- Exposed vegetation over snow (Cecile, Andy)

Horizontal model development:
- Partial snow cover (Andy)
- Snow redistribution (Cecile)
- Generalized tiles

Multi-layer Snow Module for JULES

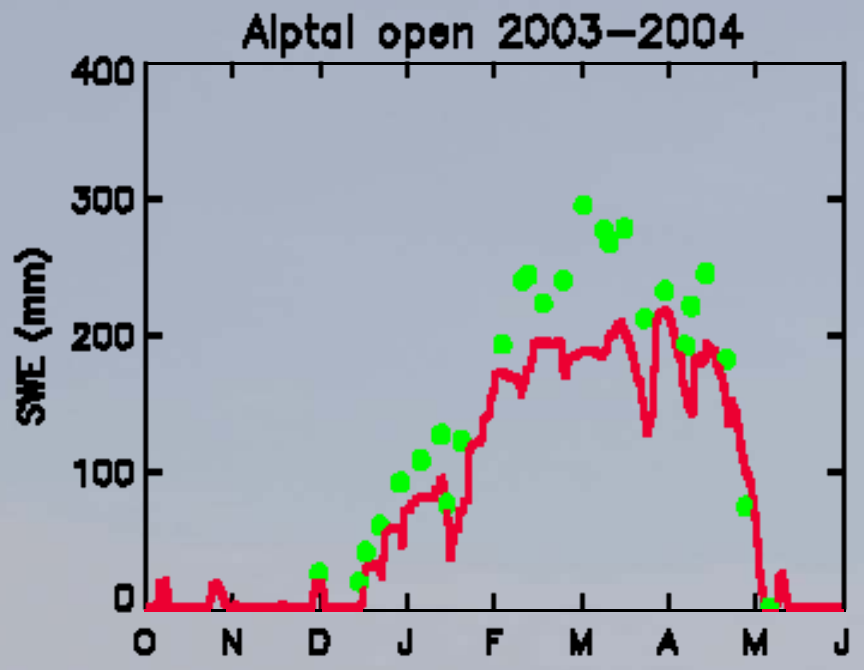


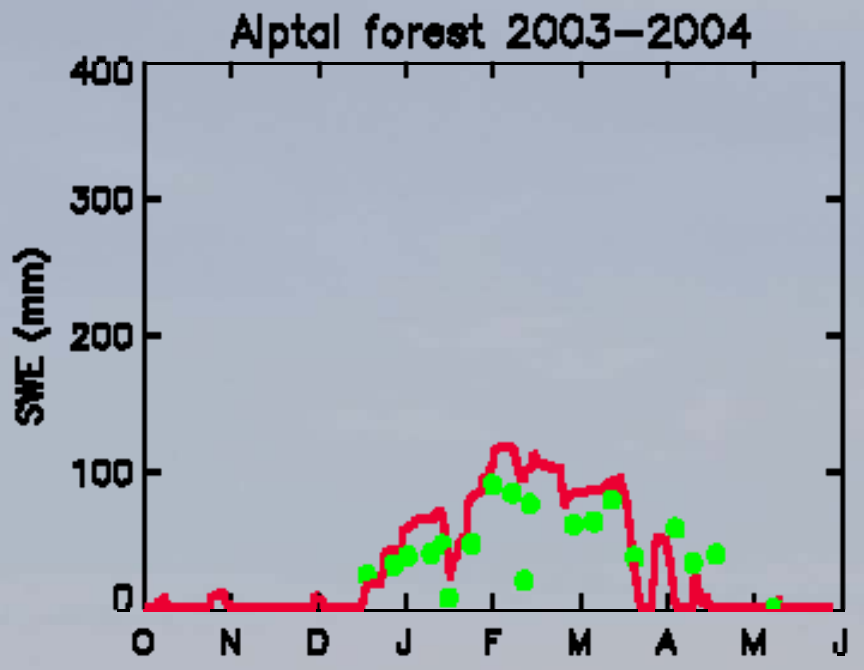
Snow and Vegetation

CAN_MODEL = 1-3:
All snow held in canopy
→ low albedo, high roughness, $T_* \leq 0°C$
→ high energy for sublimation and melt

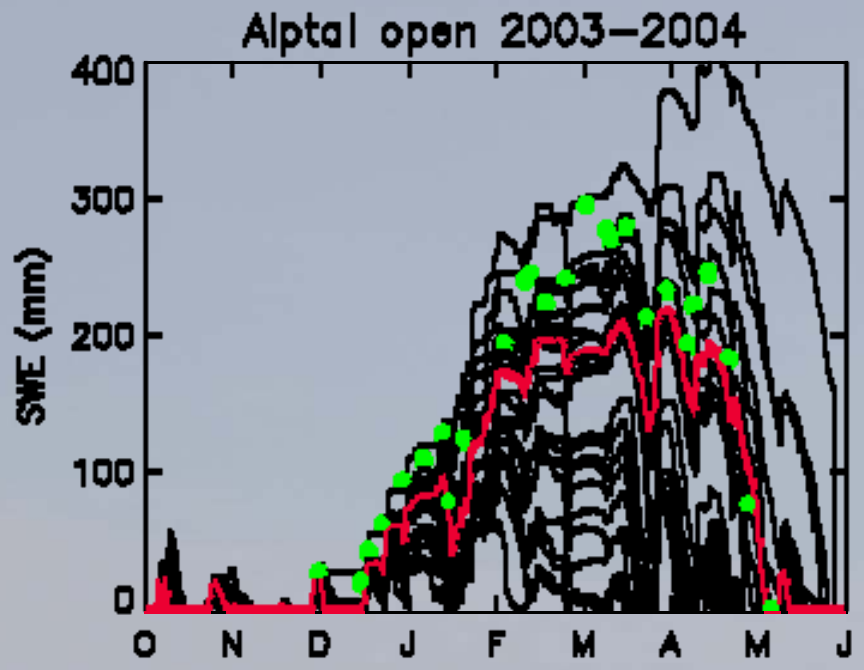
CAN_MODEL = 4:
Snow partitioned and LW coupling between canopy and ground
No SW transmission (dense canopy)

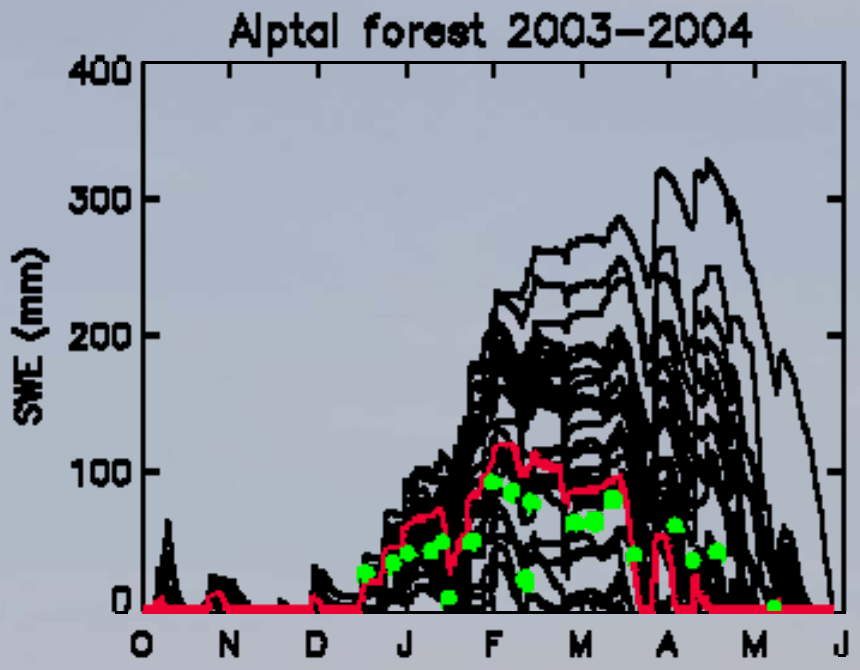
Snow and Vegetation



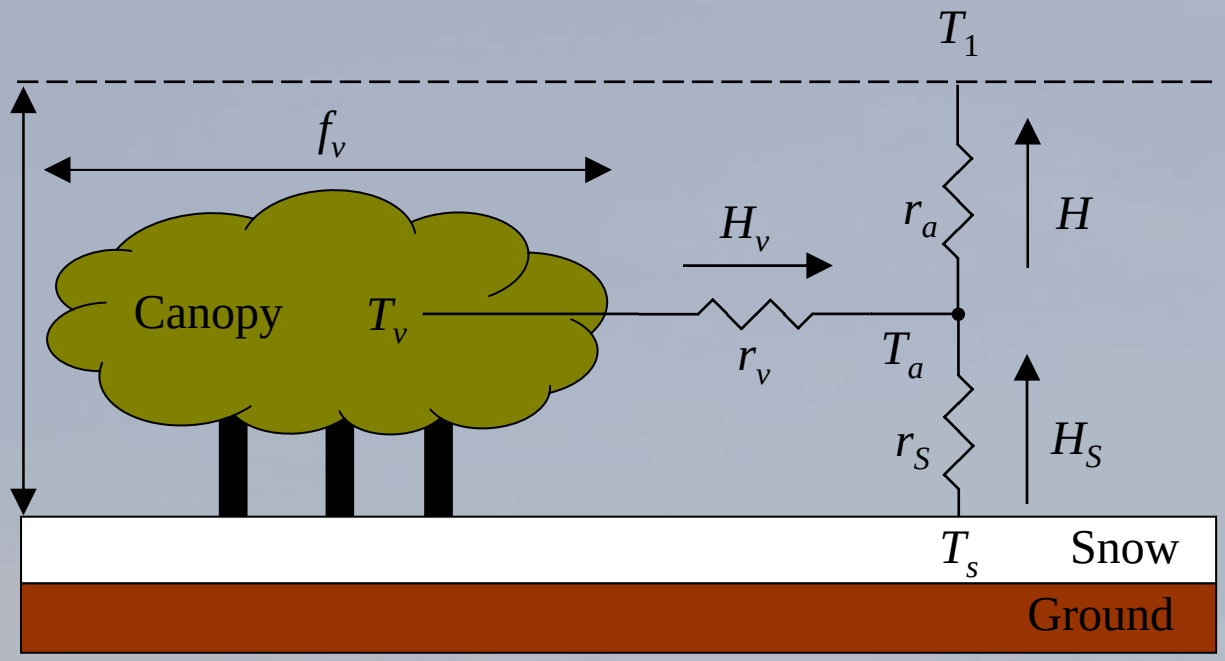


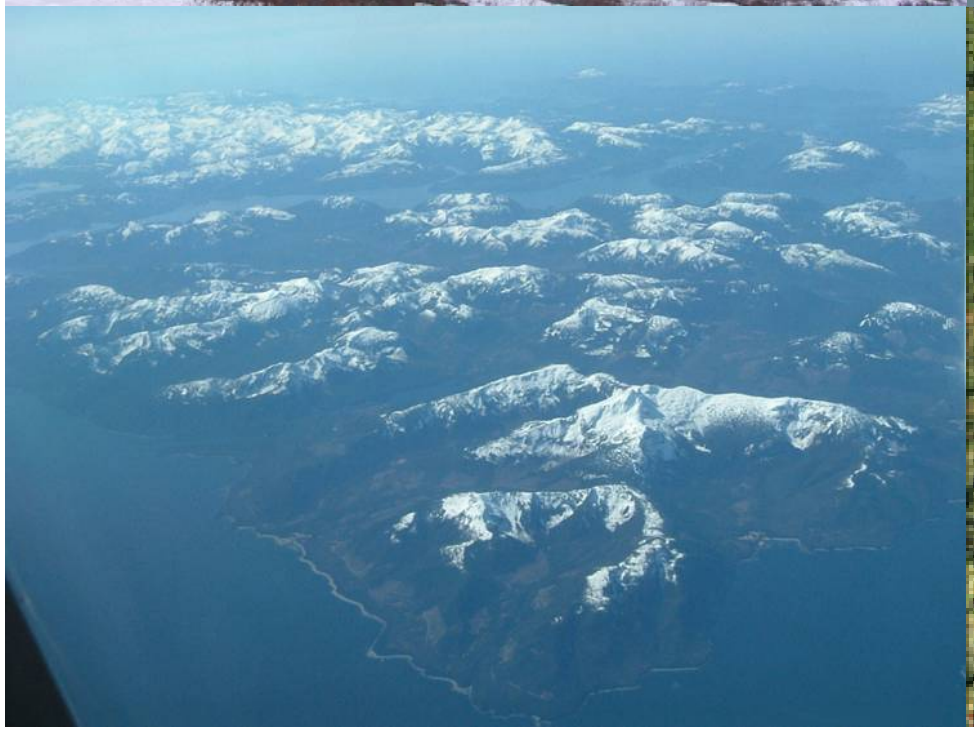
Snow and Vegetation



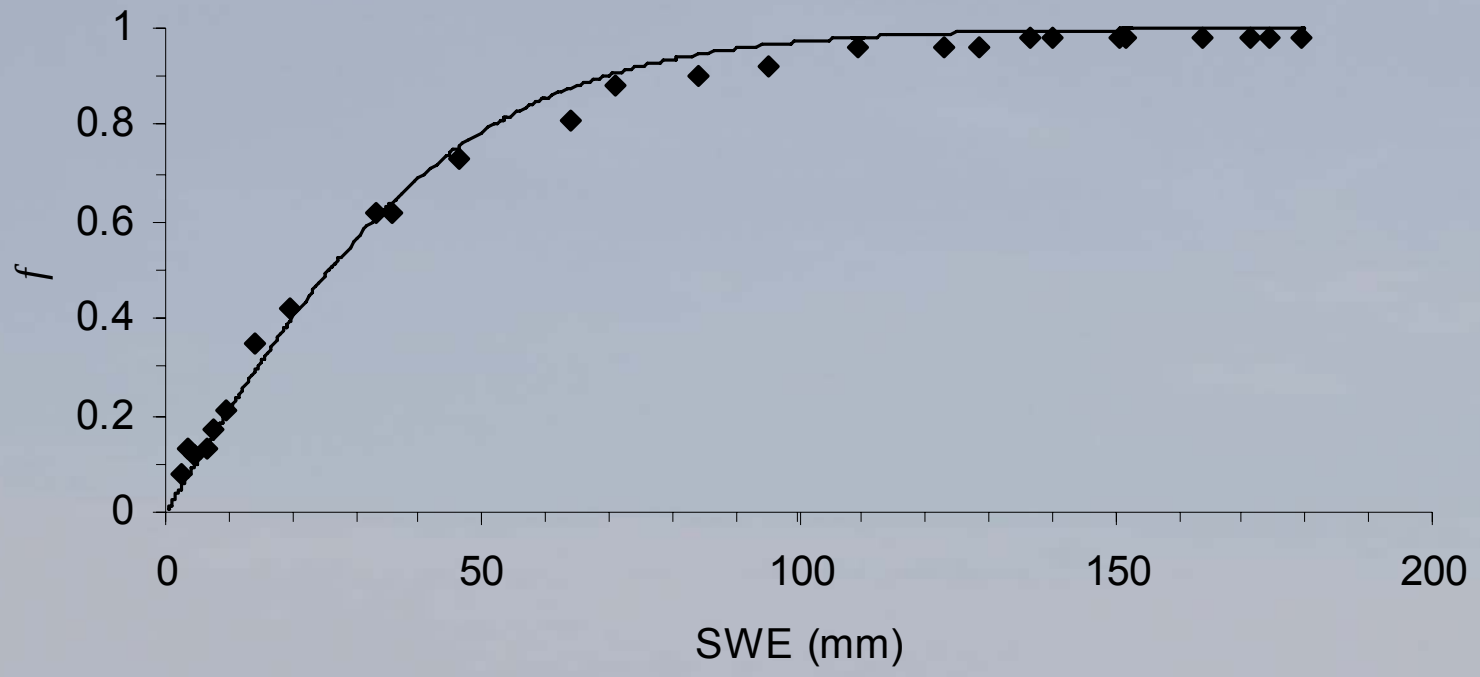


Snow and Vegetation

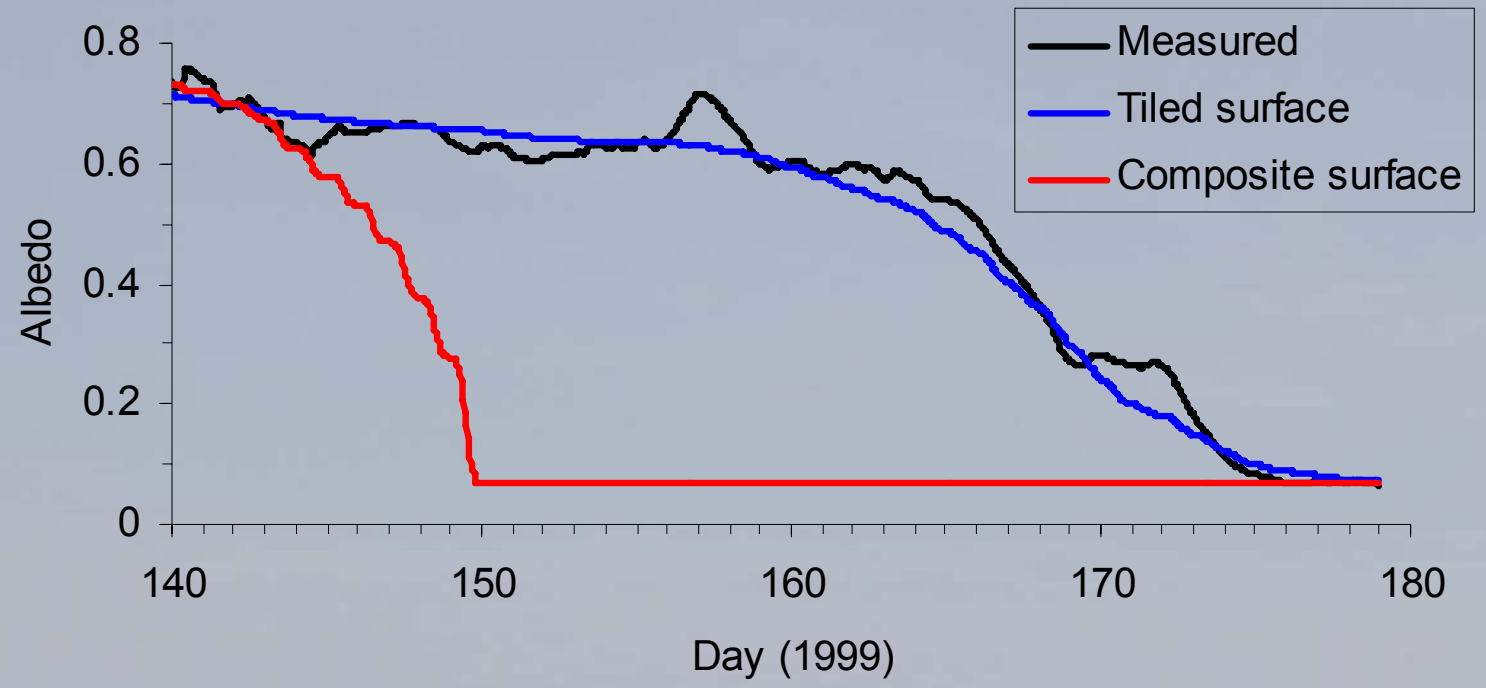
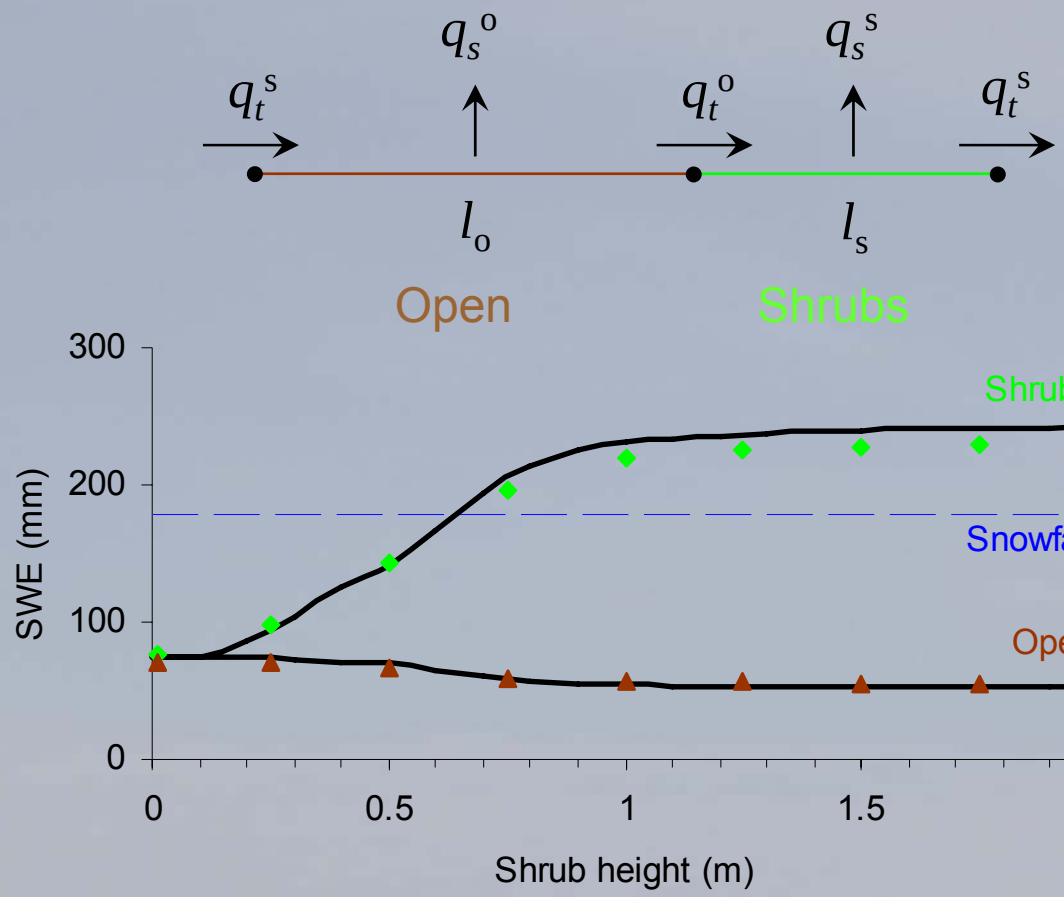




Partial Snowcover



Energy Balance of Partial Snowcover



Blowing Snow: Horizontal Interaction Between Tiles