Snow processes and parameterisation in complex landscapes

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LiDAR topography and vegetation height

Wolf Creek
(Granger Basin)

Marmot Creek
(Nakiska ski area and cut blocks)
Distributed Blowing Snow Model

New release available from ftp://arts-hydrology-ip3.usask.ca/essery/DBSM

- Mason-Sykes or Ryan wind flow model options
- SBSM or PBSM snow redistribution model options
- surveying utility
- examples and (basic) documentation included
Snow and exposed vegetation fractions:
Parameterisation of snow cover fraction

Vegetation fraction
Shrub bending model
Simulation of exposed vegetation fraction
Parameterisation of exposed vegetation fraction
Simulated albedo of heterogeneous surface
Heat flux and snowmelt simulations

Plateau

Valley
Canopy ray tracing

Aerial photograph

Simulation

Canopy ray tracing

20 m × 20 m area

Elevation (°)

Azimuth (°)

Parameterization

Simulation

Point
• combine DBSM, SBM, 3SM and LiDAR mapping in a distributed model for Granger Basin

• use to investigate influences of model resolution and changing vegetation distributions

• investigate reliability of parameter transference between sites (Laura Comeau, following Pablo Dornes)

• apply heterogeneous canopy parameterisation over large areas with complex topography (Chad Ellis, Tim Link)