Snow and Ice Impacts

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Accuracy of Austrian Snow Cover Simulations

Slide from Simon Dadson
Impact of Snow Module on Soil Temperature

Slide from Cécile Ménard
Impact of Snow and Air Temperature on Soil Temperature

Slide from Cécile Ménard
Impact of Tundra Shrub Expansion

Vegetation height (m)

20 m contour interval

1 km
Impact of Tundra Shrub Expansion

Vegetation height (m)

Sensible Heat (W/m$^2$)

Day

Snow depth (m)

Day
Snow and exposed vegetation fractions:

\[ f_{\text{snow}}(S_d, z_0) \quad f_{\text{veg}}(S_d, h) \]
Impact of Snow on Shrubs

19 April

12 May
No mass fluxes between gridboxes – gridbox assumed large compared to glacier area
Impact of Snow on Glacier Ice Temperature

Graph showing:
- Snow depth (m) against Day (starting 1 January 2004)
- Ice temperature (°C) against Day (starting 1 January 2004)

Legend:
- Dry model
- Wet model
- Observations

The graph illustrates the relationship between snow depth and ice temperature over a period of time, starting from 1 January 2004.
Ice Sheet Scheme

Regional Climate Model

Surface fluxes

Surface melt

Jules snow scheme

10cm

40cm

Flexible

Snow layers

Mass

Heat

Basal melt

Vertical tiling

Subgrid Hypsometry

Delta elev (m)

Mean elev

Subgrid Hypsometry

Ice Sheet Model

Sea level rise

Slide from Jeff Ridley