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Glide-snow avalanche formation: First insights from soil and snow monitoring

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Motivation

Glide-snow avalanches endanger infrastructure in alpine regions



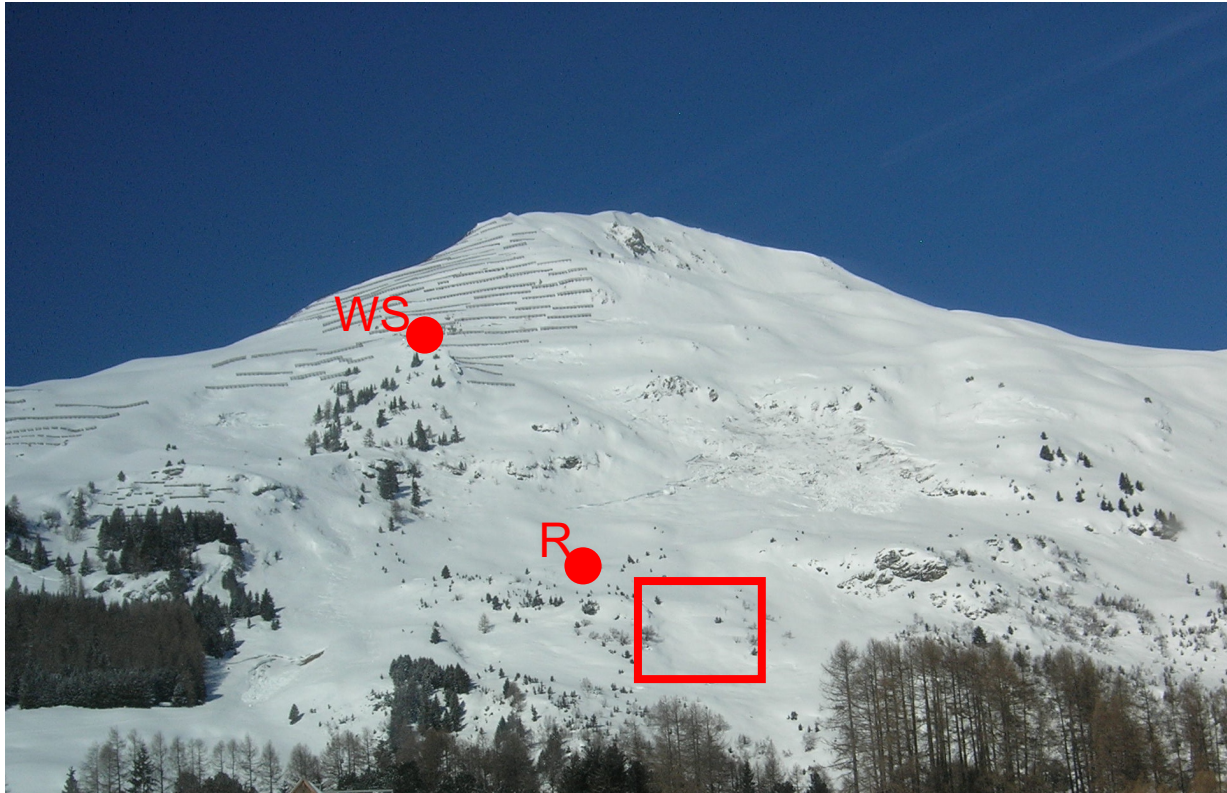
Dorfberg, Davos, Switzerland
(Photo: SLF Webcam, 27.12.11)



Wuosthorn, Davos, Switzerland
(Photo: J. Schweizer, 06.04.18)

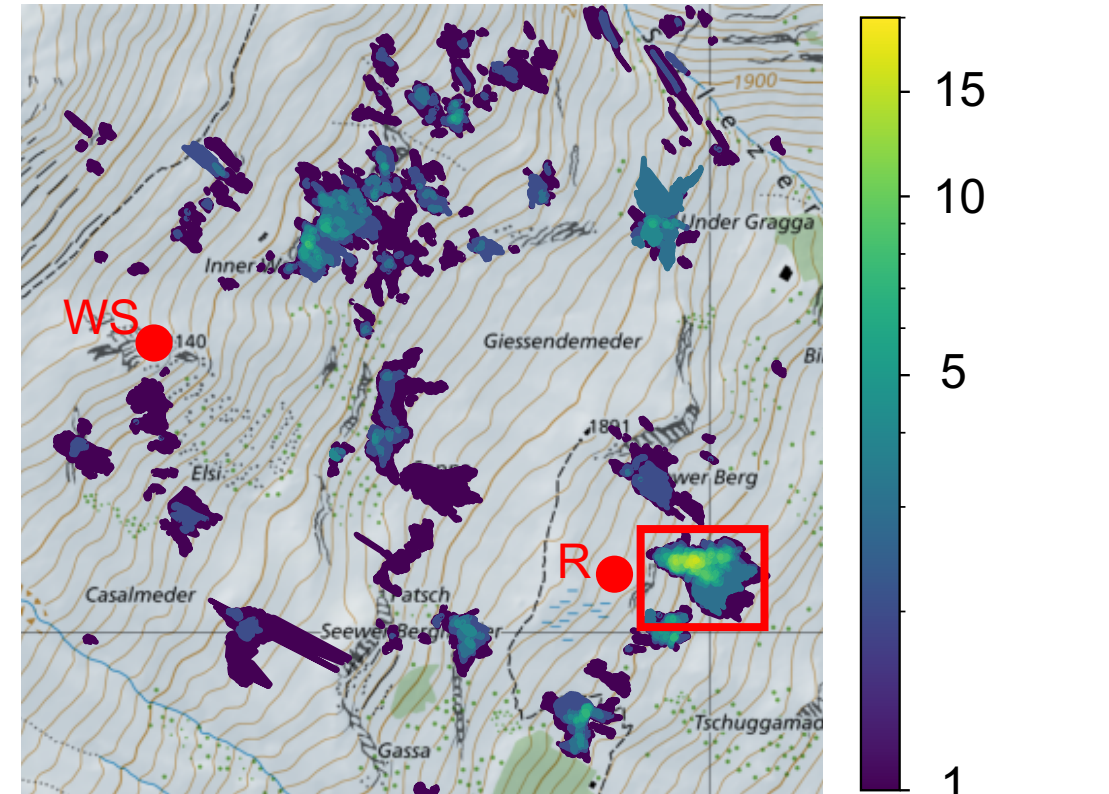
Field site for reliable observations

Dorfberg Davos, Switzerland



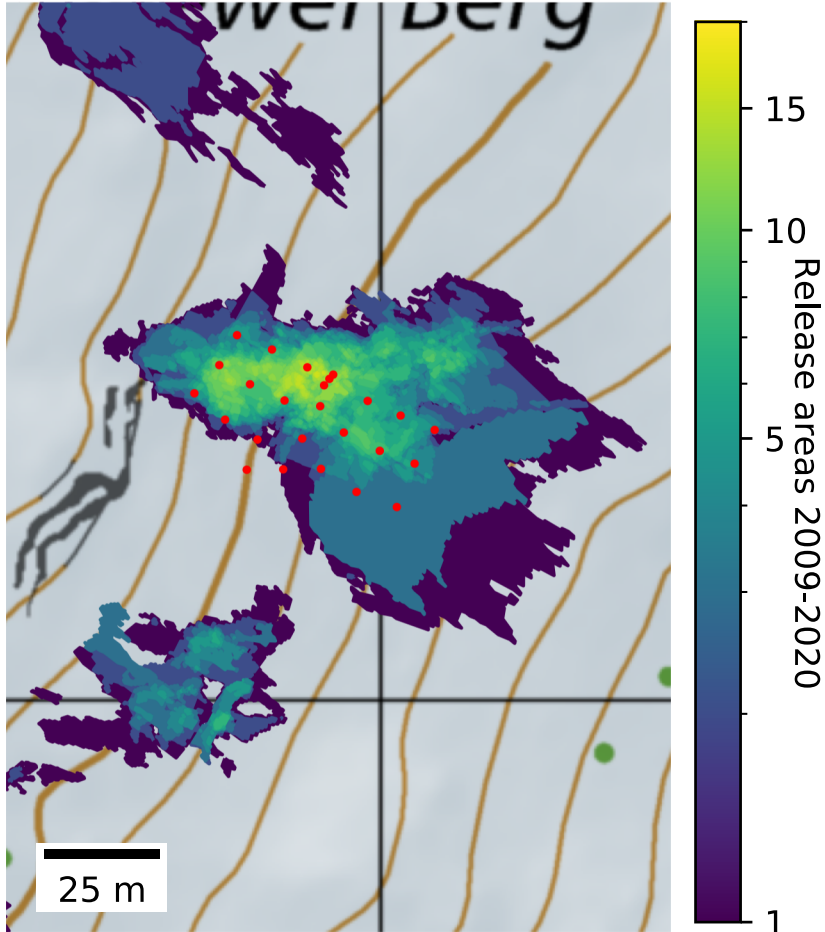
Weather station (WS) and reference site (R)

Release areas 2009-2020



Instrumentation

Monitoring soil and snow properties: 2D-grid and vertical profiles



2D-grid: 24 sensors (-5 cm):

- Water content and temperature (Teros11)

Vertical profiles (-5 cm, -10 cm, -20 cm):

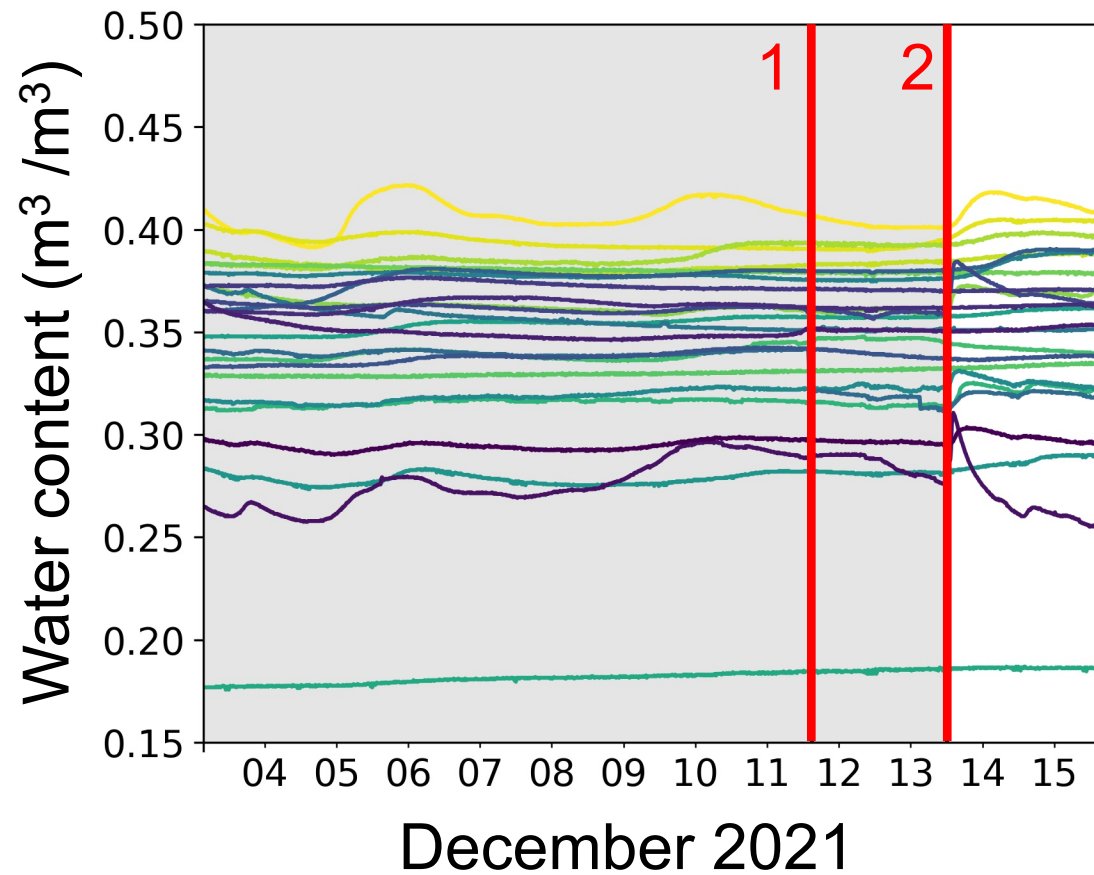
- Soil: matric potential, water content and temperature (Teros11, Teros21)
- Snow: water content and temperature (Ec5, T107)



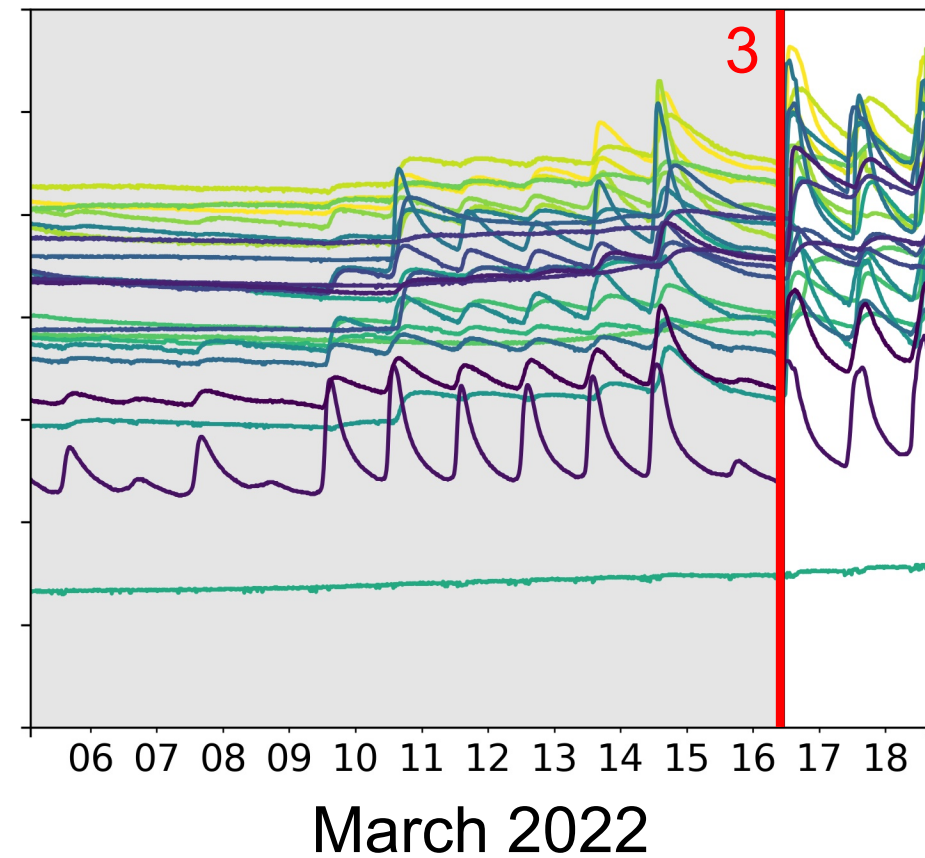
Temporal evolution of soil water content

Snow meltwater percolation preceding warm event

Early winter (cold) events



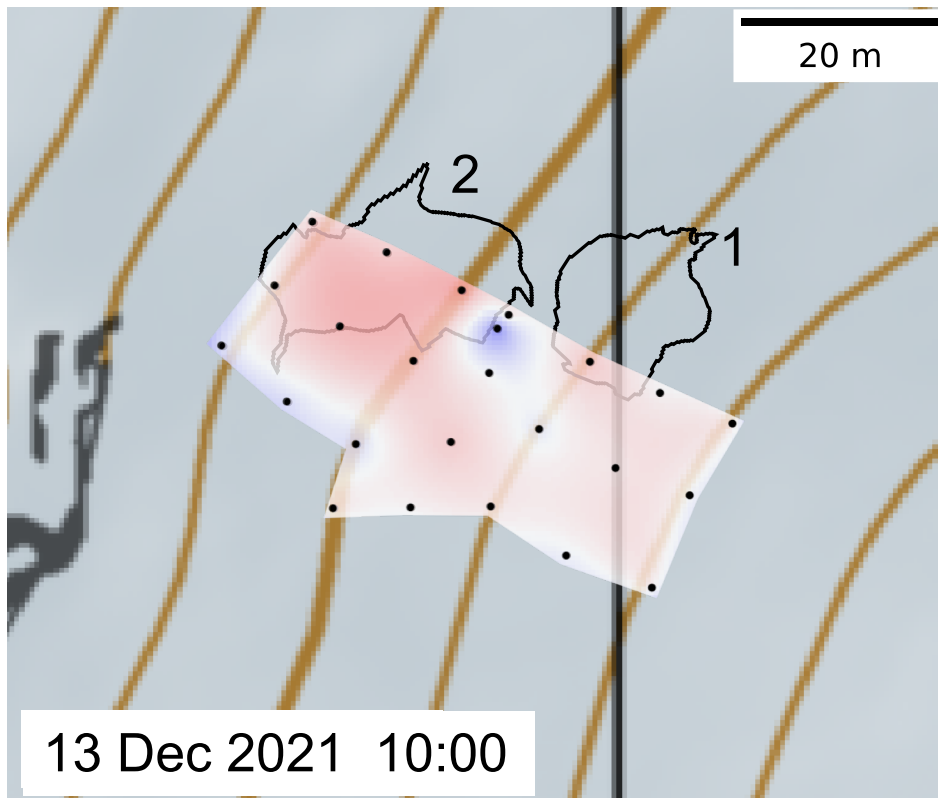
Spring (warm) event



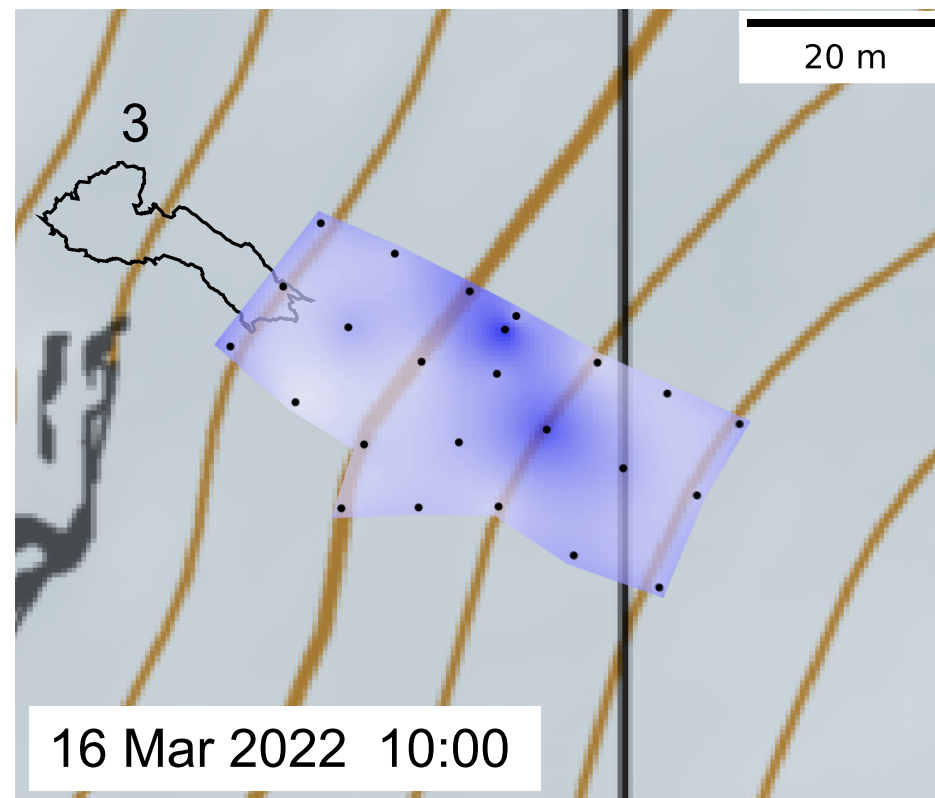
Relative water content before avalanche release

Cold event with low relative water content

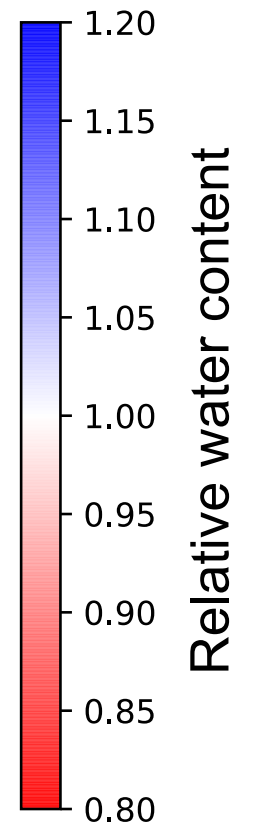
Early winter (cold)



Spring (warm)

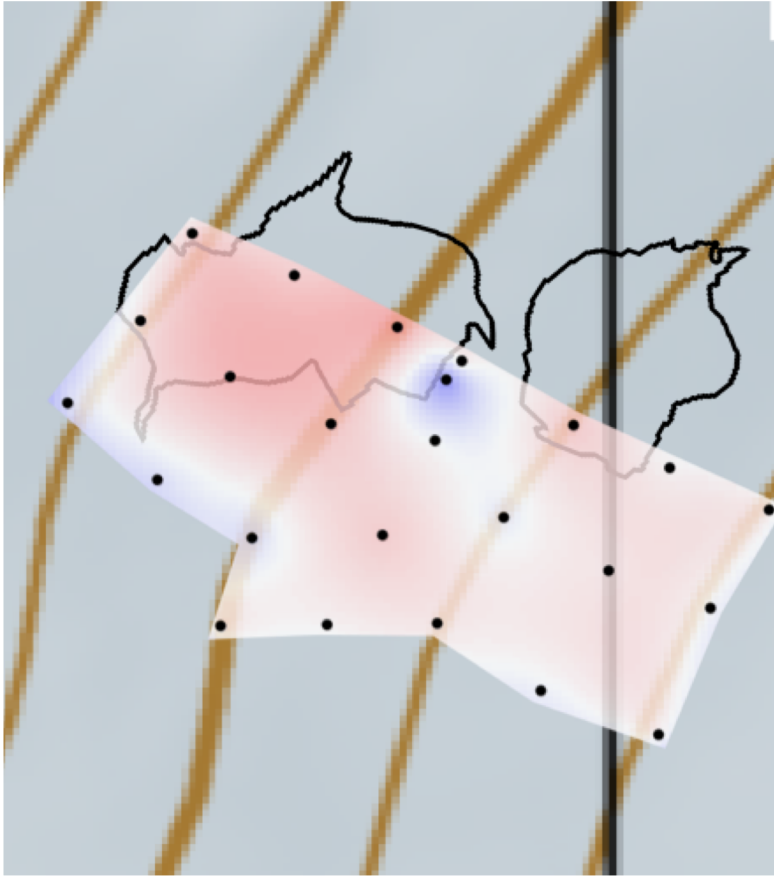


More wet



More dry

Outlook



Spatio-temporal analysis
of available data



Investigation of inhomogeneities across the slope



Hope for a winter with a lot
of glide-snow activity...