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# Analysis of past snow conditions in Norway

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### Outline

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  - Trend analysis of snow parameters
  - In the light of climate change





Observed changes in Norway between 1961-90 and 1979-08

- Winter precipitation has increased by 5-25 %
- Winter temperature has increased by 0.91-1.34 °C

(Hanssen-Bauer et al., 2009)

What about snow conditions?



**Results** 

#### Snow parameters







- Mann-Kendall non-parametric trend test
  - Evaluate significance of trends in snow series
- Linear trend test
  - Compare slopes to mean winter temperature
- Analysis of correlation
  - Investigate snow parameters sensitivity to variations in winter temperature and precipitation for the entire period 1961-2008

#### Period I (1931-60)



### Period II (1961-90)



#### Period III (1979-08)





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#### Summary

- More and more negative trends in number of snow days throughout the entire study period strong decrease in warmer areas in the last decades
- Max snow depth has increased in some colder areas in the last decades
- Warmer regions: Snow season duration and snow amounts are sensitive to changes in winter temperature
- Colder regions: Snow amounts are sensitive to changes in winter precipitation



• Analyse future snow scenarios

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## THANK YOU!



Mountain snow conditions - a rather unexplored field...

#### Snow season duration: Period of permanent snow cover

#### **Results**

#### Fanaråken (2062 m.a.s.l.)



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