AUGMENTED INTELLIGENCE FOR AVALANCHE FORECASTING

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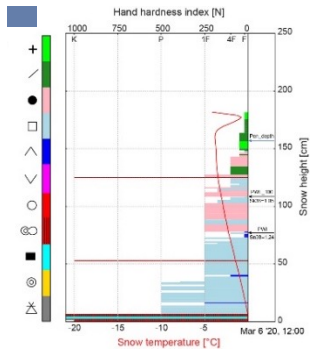
Swiss Data Science Center and WSL institute for Snow and Avalanche Research (SLF Davos)

Augmented intelligence for avalanche forecasters

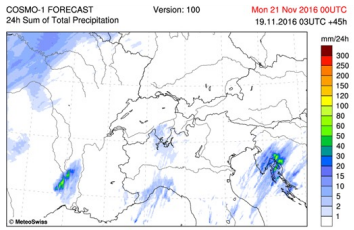
Data:

Weather stations:

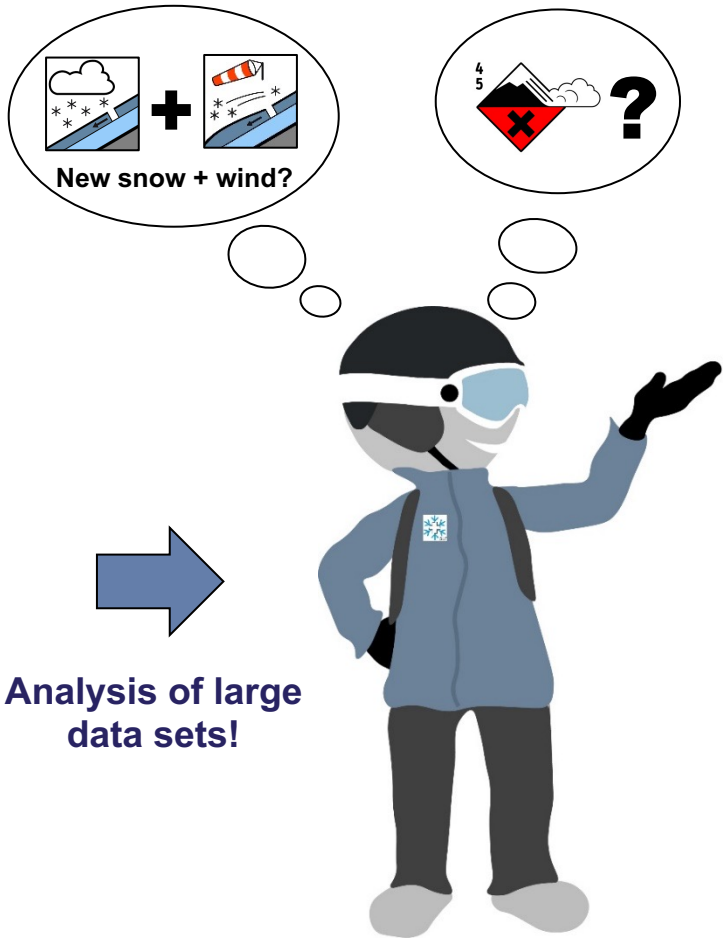
Snow profiles:

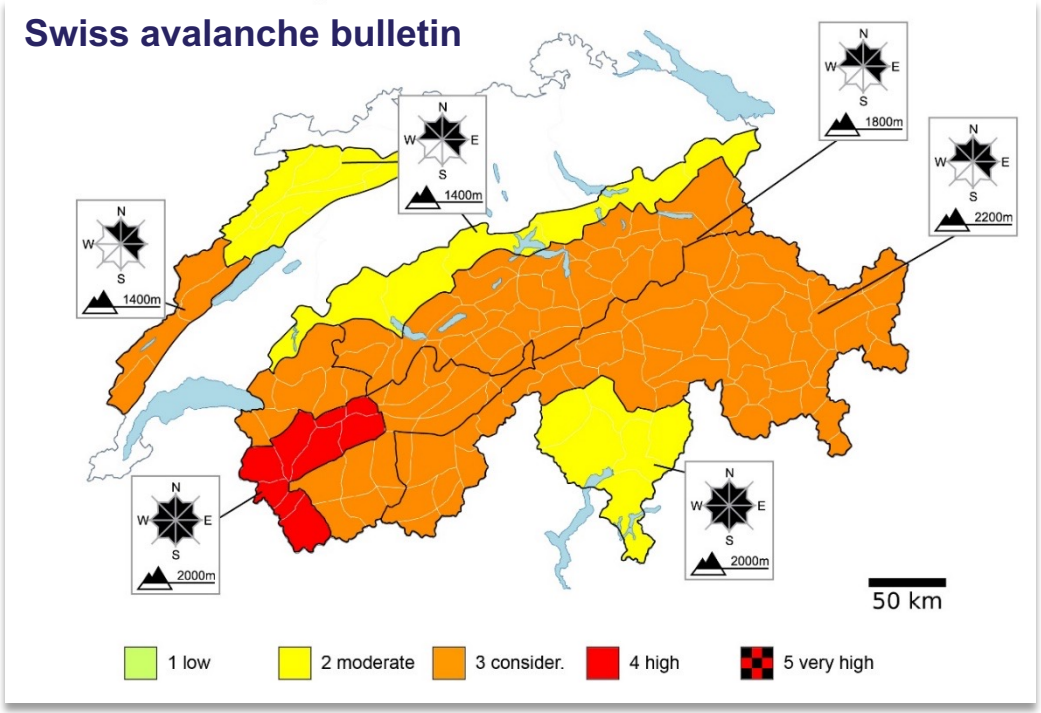


Weather forecasts:



and more…





Assessing **avalanche danger**:

- **Qualitative** descriptions of key terms
- **Human**-decision process: **expert** knowledge
- Potential for forecast **bias in space and time**

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Augmented intelligence for avalanche forecasters

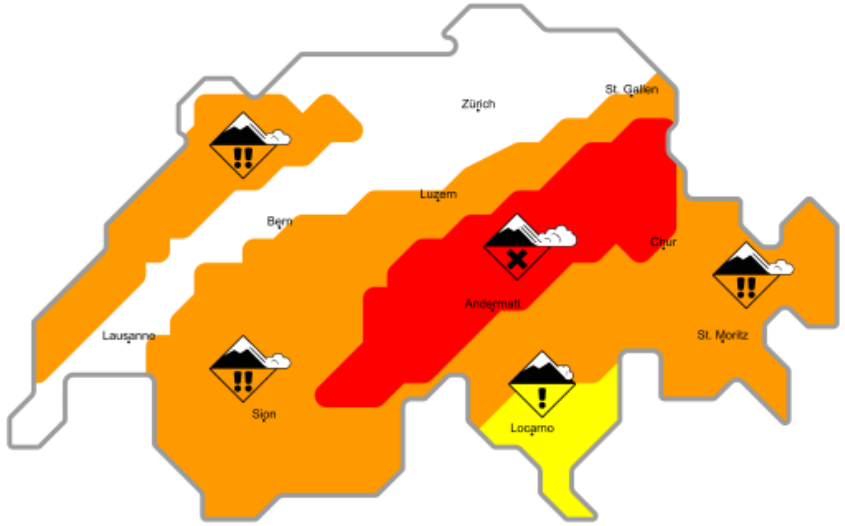
IN:

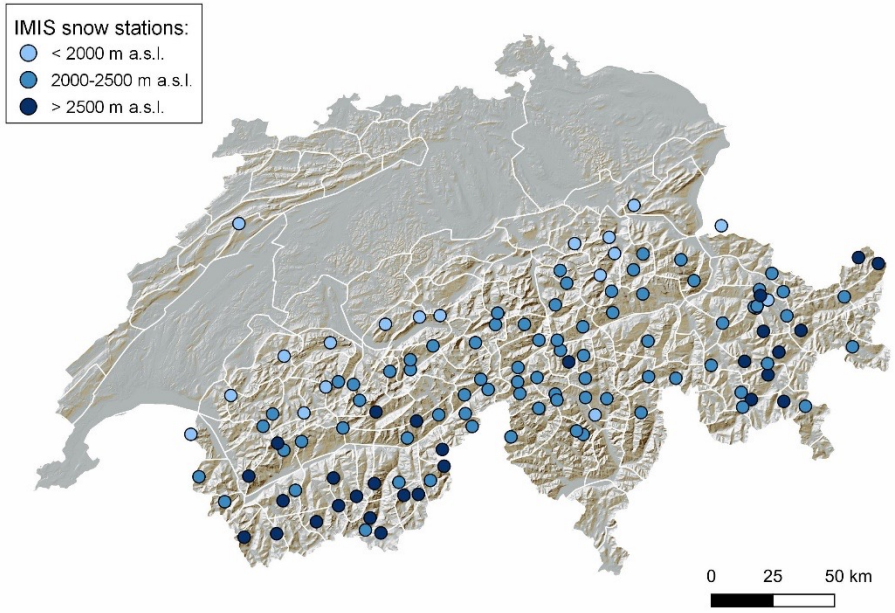
- Weather stations + snow sim + forecasts

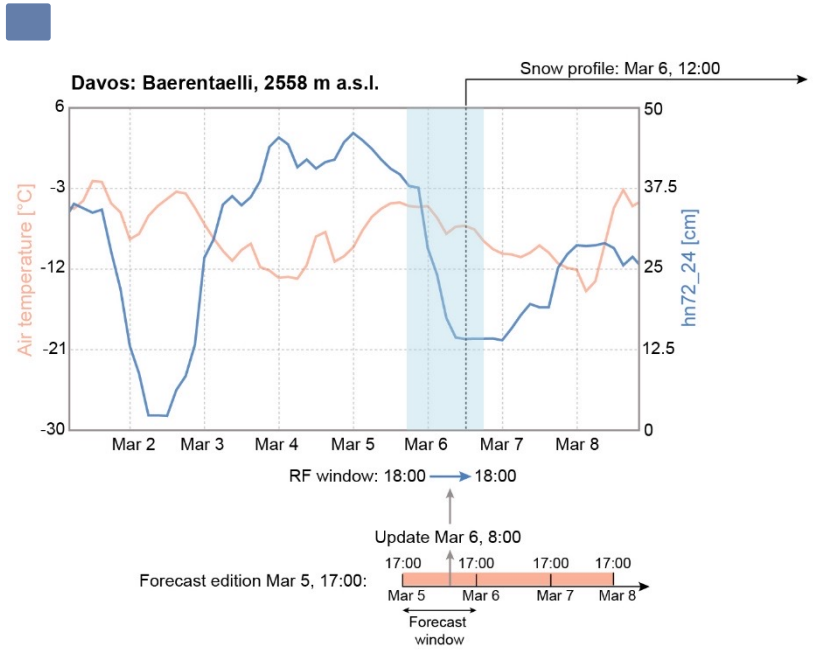
TARGET:

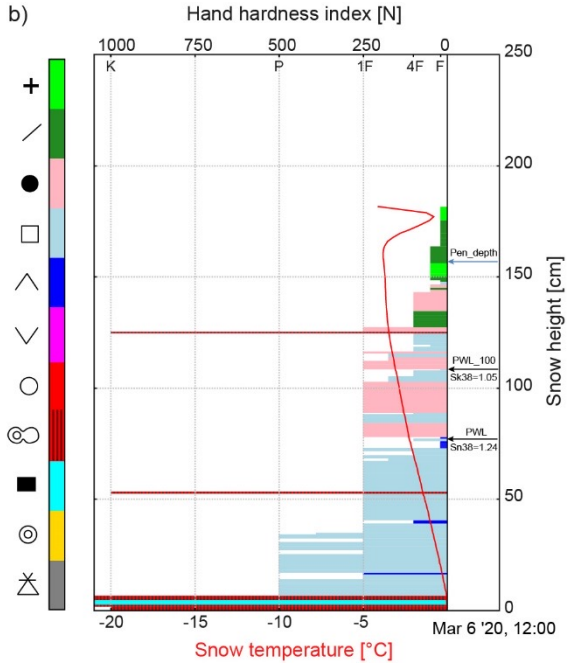
- Avalanche bulletin for day+1

- **22 seasons of paired data**



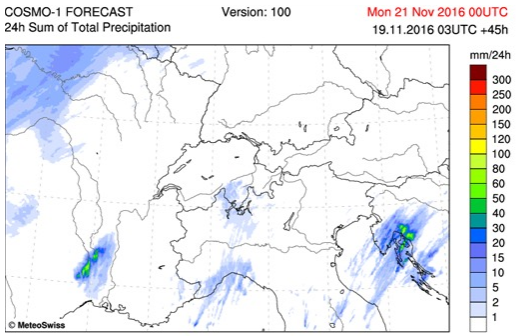






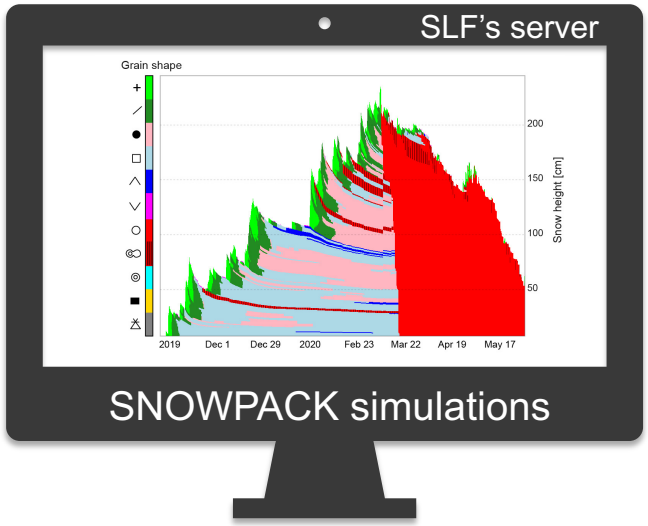
Real-time predictions

Nowcast measured weather data



Forecast weather data NWP COSMO

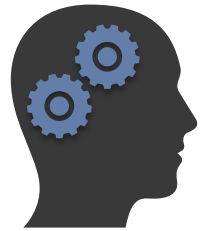
Input data



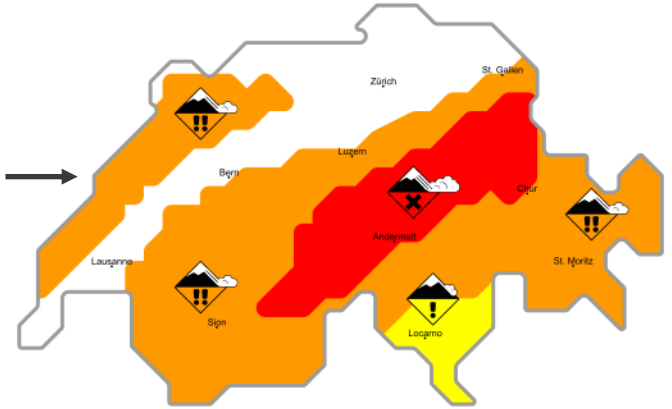
every 3h

every 3h

Nowcast & **Forecast** predictions (flat, N, E, S, W)



Random Forests



Dry-snow conditions

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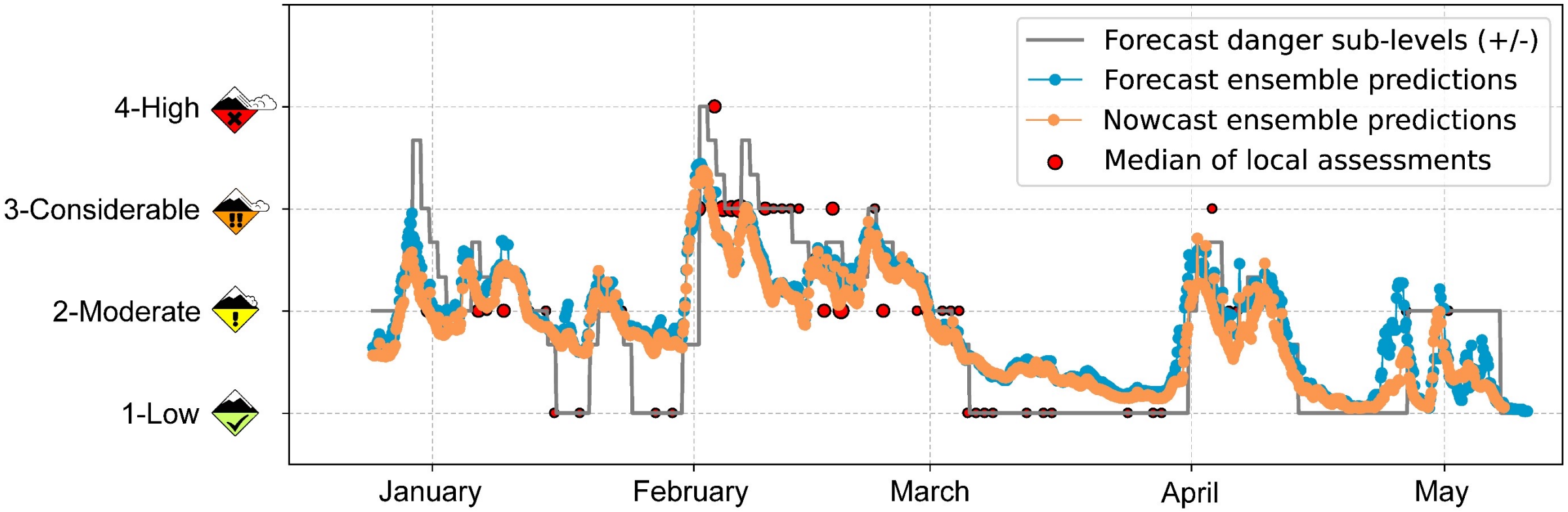
Regional prediction: Davos district

Winter season 2020-2021, aggregated probability per district



Pearson correlation: 0.79
MSE: 0.20

Pearson correlation (nowcast): 0.76
MSE: 0.22

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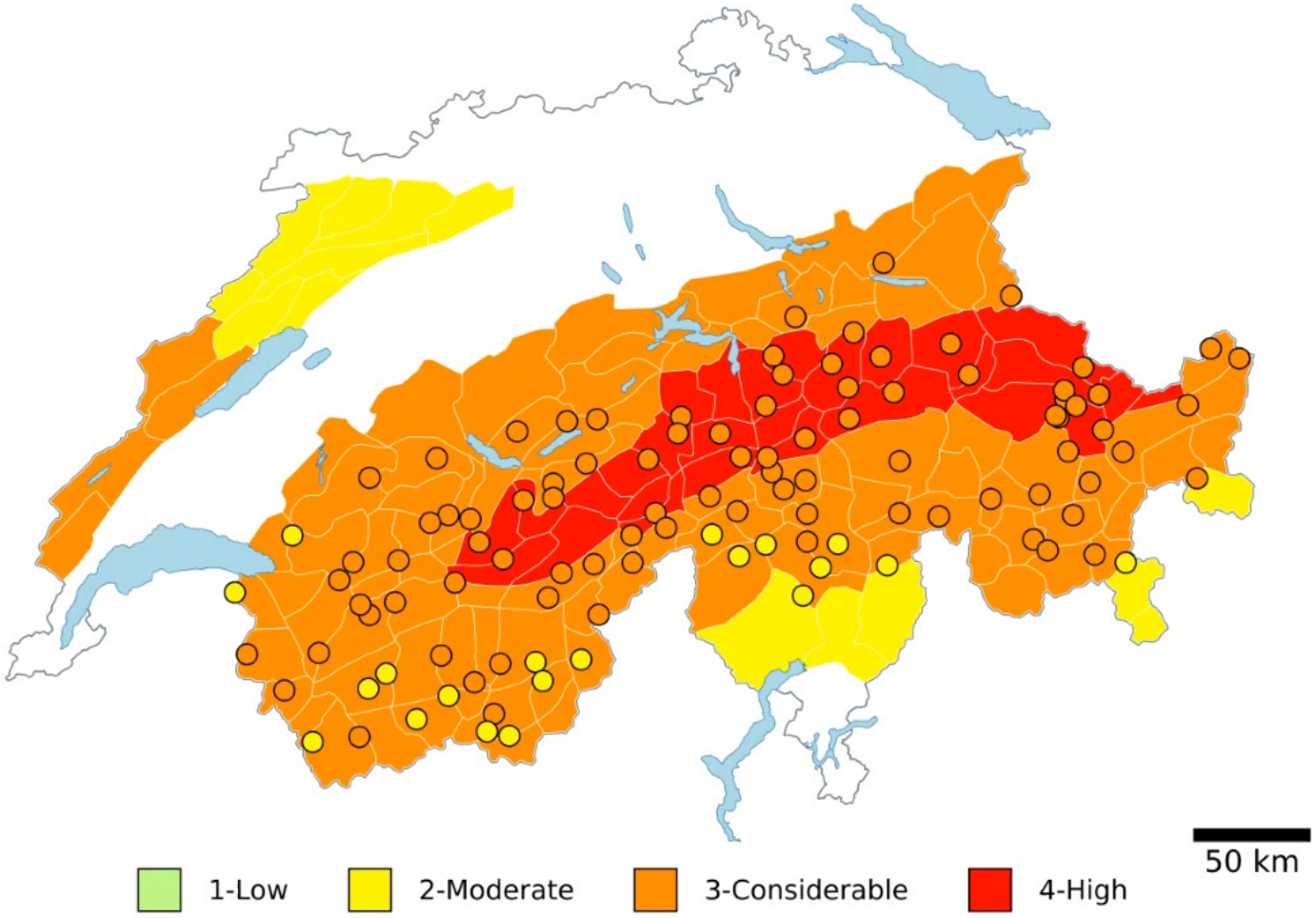
Forecast predictions on Tuesday, 01 Feb 2022



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ETH zürich

EPFL

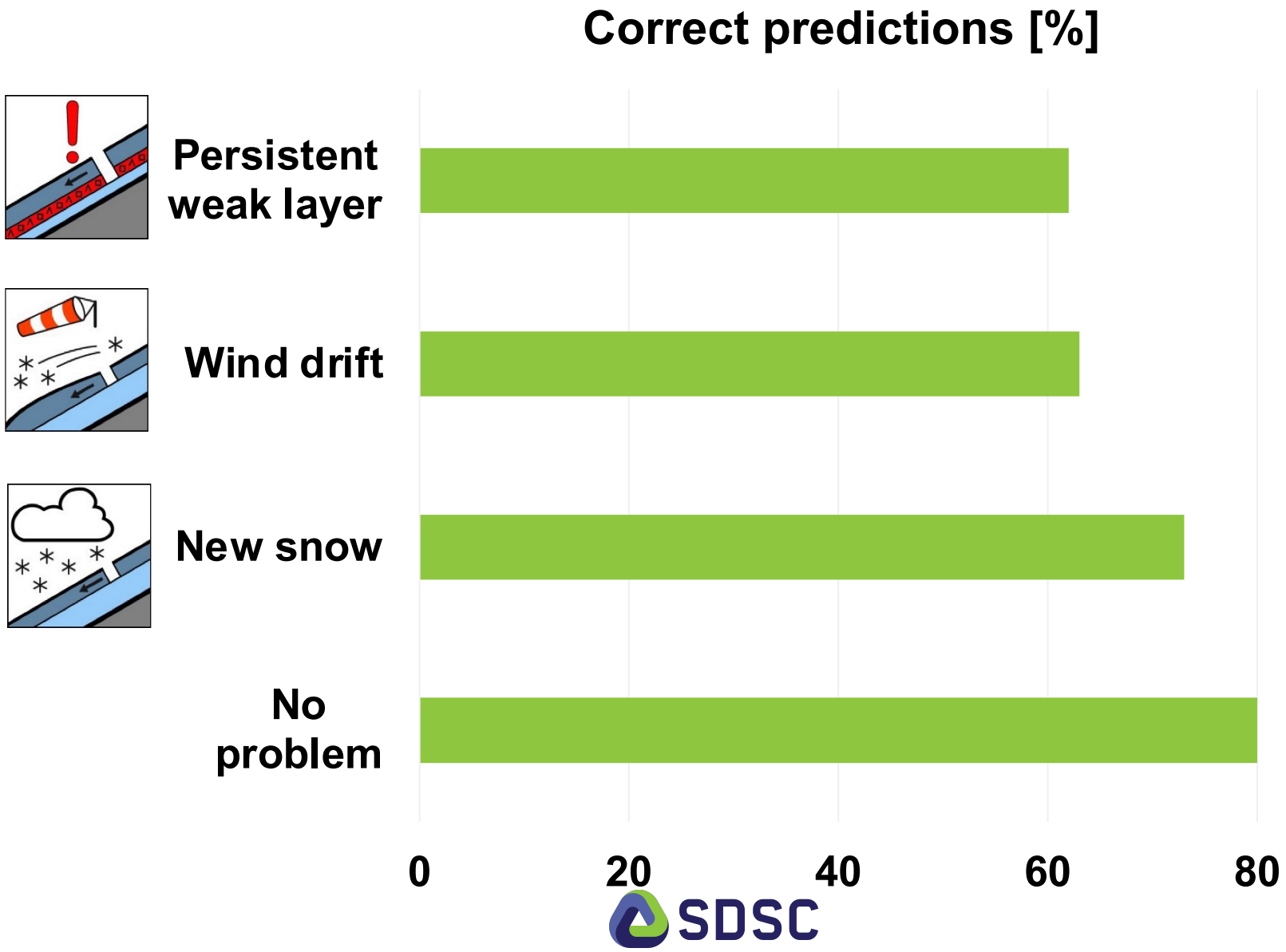
PAUL SCHERRER INSTITUT PSI

WSL Eidg. Forschungsanstalt für Wald Schnee und Landschaft WSL

Empa Materials Science and Technology

eawag aquatic research

Per-avalanche problem assessment



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