Wind Ice and Snow Load Impacts on Infrastructure and the Natural Environment (WISLINE)

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FIgure 1: Cloud icing, Desember 2013. Photo Ole Gustav Berg/Statnett

Figure 2: Snow load on power line. Photo Hallingdal Kraftnett

Figure 3: Wind damage from Dagmar. Photo Jon Eivind Vollen/Skogkurs

Deliveries from WISLINE

- Improved cloud physics scheme of the widely used numerical weather prediction model AROME, i.e. an improved ability to simulate atmospheric icing.
- Datasets of atmospheric icing, extreme wind etc. for both present and future climate based on AROME in combination with ice accretion models.
- Statistical model for weather induced forest damage and risk maps for present and future climate.
- Open access to all datasets produced by WISLINE

Background WISLINE

The combination of wind and atmospheric icing is a major weather hazard in many mid- to high-latitude locations in the winter, including Norway. There are mainly three types of atmospheric icing:

- in-cloud icing due to (supercooled) liquid cloud droplets (Figure 1)
- icing due to supercooled rain drops
- icing caused by wet snow or sleet at temperatures just above freezing point (Figure 2)

Wind and ice have on several occasions damaged power lines while wind and heavy snow cause damage to forests such as up-rooting and stem breakage (Figure 3). The storm Dagmar, that hit Norway in December 2011, caused insurance payouts to forest owners of approximately 60 millions NOK (~ 7 millions EUR).

Design of technical infrastructure and long term planning with respect to wind, ice and snow loads require extensive knowledge about both present and future climate. By utilizing the competence in 6 different institutions WISLINE aims to quantitatively assess how climate loads connected to wind, snow and ice are impacted by climate change.

A user group will serve as pilot users of datasets and help WISLINE to produce results that are beneficial for society.

The cloud physics scheme of the AROME model is crucial for the simulations of atmospheric icing. The picture above is from Gaustatoppen, 1883 m above sea level. Despite the rough environment, the met station is frequently inspected, and we plan to measure the distribution of precipitation particles for validation purposes. Photo Ole Jørgen Østby, MET Norway.

Observations of atmospheric icing from Hardanger in Western Norway (Figure 1) and another site will also be used for validation.

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User group
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