



Improving road weather model forecasts by adjusting the radiation input

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Accurate road weather forecasts can provide very essential guidance for road maintenance authorities to keep roads safe during winter time. Not only can significant savings be achieved by reductions in traffic accident rates, but also the total maintenance costs can be optimized following preparedness and timely actions against the freezing of roads. Accurate road condition forecasts are highly dependent on the proper use of observations. The observations can even be used to adjust or correct some atmospheric variables, which the road condition model uses as input originating from a numerical weather prediction (NWP) model. The NWP models have typically a horizontal grid size of several kilometers, so they cannot take into account small-scale local effects. However, such local features can significantly affect e.g. the amount of radiation reaching the road surface. The present paper focuses on various methods to improve forecasted radiation using road surface temperature observations originating from road weather stations, with the goal to improve short-range road condition forecasts. There were totally 18 different configurations being tested over a three and a half month period, October 2013 to January 2014. The selected test sites were 20 road weather stations covering different geographical regions in Finland. The results show that the forecasts can indeed be considerably improved by utilizing some of the tested methods, and two of the configurations turned out to be superior to the others. One further major finding of this study was that the duration of the adjustment period (i.e. time window) within which the radiation adjustments were applied had only minor effect to forecast skill.