Reference: Evaluation of the originally Europe based forecast system ADWICE with Pilot Reports over the Eastern US.

Methods: The German forecast system ADWICE, which uses model data from the weather forecast model COSMO-EU to produce a forecast, was run over the Eastern US. The forecast, which discriminates between four scenarios about the formation of supercooled liquid water, was compared to pilot reports (PIREPs) over the same area to evaluate the forecast made by ADWICE for three days. On those days different synoptic situations occurred and the mechanisms of the forming of supercooled water were different. The intention was to compare how ADWICE and COSMO-EU handled the different situations.

January 6th, 2010

On the 6th of January, stratiform icing prevailed, which was forecast correctly by ADWICE. The forecast soundings were close to the observation, but the inversion was forecast too low, so there were stratus clouds and therefore icing in heights where no icing was predicted. The medium to severe icing in the area of the Great Lakes was not observed at the locations where it was predicted, but there was light icing forecast over the whole area, so at least some icing was predicted. The ROC-curve does not show a good result for this day. It proves that the forecast is not better than a random forecast.

February 5th, 2010

On the 5th of February, the forecast by ADWICE was mostly correct. An area, where the forecast was wrong, was the Great Lakes. There, ADWICE predicted a wide area, in which freezing rain occurs. This was proven wrong by the PIREPs and the soundings. The temperature in the soundings was slightly lower than the forecast temperature, so there was no melting layer and snow occurred instead of freezing rain. This is an example how small variations in temperature can have great influence on the quality of the forecast. Instead of freezing rain. This is an example how small variations in temperature, so there was no melting layer and snow occurred.

February 15th, 2010

On the 15th of February, the ROC-curve shows the best results of the three days. The icing, which occurred in connection with the low pressure system over Ohio and the corresponding front systems, was forecast correctly. North of the front, problems occurred. In the vicinity of the Great Lakes, a humid layer was not recognized, therefore observed icing was not forecast.

Conclusion

It was found that the forecast of the sounding is extremely important for the correct forecast of icing. Where the soundings are forecast correctly, the forecast of icing is correct too. Where the soundings are forecast incorrectly, it is not possible for ADWICE to forecast icing correctly. The areas, in which ADWICE forecast no icing were usually ice-free. There are many areas though, where icing was forecast but not observed. It was not examined whether the negative reports were at the same height as the forecast icing, therefore it was not possible in this study to determine if ADWICE tends to overforecast.