EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-271, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9th European Conference on Applications of Meteorology
High resolution meteorology
- applications and services

Route based forecasting

I.W. Zuurendonk (1) and M.J.J. Wokke (2)

(1) MeteoGroup, Meteorological Research and Development, Wageningen, Netherlands (ingeborg@weer.nl), (2) MeteoGroup, Meteorological Research and Development, Wageningen, Netherlands (marcel@weer.nl)

Road surface temperatures can differ several degrees on a very short distance due to local effects. In order to get more insight in the local temperature differences and to develop safer gritting routes, Meteogroup has developed a system for route based temperature forecasting.

The standard version of the road model is addressed to forecast road surface temperature and condition for a specific location. This model consists of two parts. First a physical part, based on the energy balance equations. The second part of the model performs a statistical correction on the calculated physical road surface temperature.

The road model is able to create a forecast for one specific location. From infrared measurements, we know that large local differences in road surface temperature exist on a route. Differences can be up to 5 degrees Celsius over a distance of several hundreds of meters. Based on those measurements, the idea came up to develop a system that forecasts road surface temperature and condition for an entire route: route based forecasting. The route is split up in sections with equal properties. For each section a temperature and condition will be calculated.

The main factors that influence the road surface temperature are modelled in this forecasting system:
•The local weather conditions: temperature, dew point temperature, wind, precipitation, weather type, cloudiness.
•The sky view: A very sheltered place will receive less radiation during daytime and emit less radiation during nighttime. For a very open spot, the effects are reversed.
•The solar view: A road section with trees on the southern side, will receive less solar radiation during daytime than a section with tress on the southern side.

The route based forecast shows by means of a clear Google Maps presentation which sections will be slippery at what time of the coming night. The final goal of this type of forecast, is to make dynamical gritting possible: a variable salt amount and a different gritting route. This will contribute to safety on the roads (colder spots will be treated earlier) and also it is financially interesting (less salt necessary and fewer kilometers to drive).