

# **Innovative Methods for Improving the Prediction of the Weather Conditions along Mountain Roads**

G. Spreitzhofer & S. Sperka

Institute of Meteorology and Geophysics, University of Vienna, Austria  
gerald.spreitzhofer@univie.ac.at

## ***ABSTRACT***

MetGIS (Meteorological and Geographic Information System) is a powerful world-wide weather forecast system specialized on the production of extraordinarily detailed forecast maps, with a particular focus on snow and mountain weather. One of its main areas of application is the field of road weather forecasting. It has been developed within the framework of a number of interdisciplinary international research collaborations.

A major feature of MetGIS is the application of highly innovative forecast techniques, combining the output of numerical weather prediction models with extremely high resolution topographic data. Especially over mountainous terrain this results in a clear advantage of MetGIS compared to conventional meteorological forecast systems, since the exact altitude and location of forecast points enters the prediction process. The construction of highly detailed forecast maps to support wintry road maintenance is possible, covering small-scale areas around mountain pass roads with horizontal resolutions of 100 m and beyond.

The very detailed terrain representation included in MetGIS allows for an easy and efficient detection of road sections above the freezing level or concerned by a particular mode of precipitation (rain, snow, sleet or freezing rain). Specific parameters of the valley geometry, easily computed from the high-resolution terrain, can be used to meliorate the prediction of the height of the snow line. The elaborate topography is also the base for the construction of interactive forecasts maps depicting the vertical profile of pass roads, including all relevant meteorological parameters and their time variation, even fog and clouds. These cross-section maps are accessible to traffic operation centers via an easy-to-use web interface, constructed in collaboration with Austrian highway authorities.