



High-Resolution Mountain Weather Forecasts using MetGIS, a combined meteorological-geographic Information System

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MetGIS is a new, combined Meteorological and Geographic Information System, with a specific emphasis on snow and mountain weather. This world-wide applicable and constantly upgraded prediction scheme has been developed within the framework of interdisciplinary international research projects with contributions from research institutes, universities and meteorological services of Austria, Switzerland, Japan, Peru, Chile, Argentina and the USA. A principal focus of the system is the production of high-resolution, down-scaled forecast maps of meteorological parameters, using a sophisticated Java-based Graphical User Interface (GUI). When operated in an automated mode, this GUI can be used to feed a web-interface providing special purpose meteorological forecasts for any institutions and companies that depend on mountain weather, for instance traffic operation centers, avalanche control centers, ski resorts, mountaineering camps and open-pit mines.

The geographic part of the system includes a topographic database relying on data of the Shuttle Radar Topographic Mission (SRTM, horizontal resolution approx. 90m) and representations of roads, rivers, railway lines, political borders and cities. Various modes of topography (elevation, slope, aspect) may be displayed, all for freely selectable thresholds and resolutions. On top of these, partly linked to terrain features, down-scaled meteorological information can be visualized in a variety of display styles. Meteorological forecast data of any numerical model can be included into MetGIS and refined by the system, provided the model output is compatible with NetCDF or GrADS-compatible formats.

Regarding features of the system specifically related to mountain areas, the high res-

olution terrain allows a very detailed estimation of the spatial distribution of surface temperature, of the form of precipitation (snow, sleet, rain), of the depth of fresh snow, the height of the snow line and the freezing level. Moreover, the system is already prepared for the integration of the output of snowpack models.

Since the start of 2007 a partly password-protected web version of MetGIS (see www.univie.ac.at/AMK/metgis) produces operational meteorological predictions for a variety of mountain regions. The 36-hour forecasts are updated four times a day and are based upon the output of the GFS (Global Forecast System). User response has been quite encouraging so far.