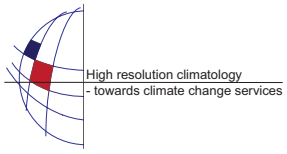
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-540, 2010
10th EMS / 8th ECAC



WegenerNet climate station network region Feldbach/Austria: local climate and weather at 1 km-scale resolution

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The WegenerNet climate station network region Feldbach (WegenerNet) is a pioneering weather and climate observation experiment at very high resolution in Eastern Styria near the city of Feldbach, Austria. The network comprises 151 meteorological stations within an about 20 x 15 area in the the alpine foreland. The study region is characterized by the Raab valley and the surrounding hilly landscape with station altitudes between 257 and 520. Measurements of high accuracy include the main parameters temperature, humidity, precipitation, and others at selected primary stations (e.g., wind speed and direction). Data is provided every 5 minutes in a tightly spaced grid of about one station per 2□($\sim$ 1.4 x 1.4 grid).

The WegenerNet project so far spanned a pilot and a demonstration phase. The pilot phase, from October 2005 to December 2007, covered the construction of the stations and of the database infrastructure. Since January 2007 regular measurements from the entire grid are provided as part of an automatic processing system including data transfer via internet-loggers, quality control, preparation, and visualization. The demonstration phase, from January 2008 to December 2009, introduced weather and climate data products on various temporal scales (from 5 to annual) for single stations as well as interpolated regular grids. Gridded data sets are realized for the main parameters in UTM (1 x 1 grid) and longitude/latitude (0.01 x 0.01 grid) coordinates. The grid points are derived from neighboring sites by inverse distance interpolation ($1/r^2$), taking into account the station data quality. For temperature, the interpolation is performed at the reference altitude of 300. The lapse rate related to project to this altitude is calculated for every 1-hour time window via linear regression for the station data at all altitudes in the grid. The temperature data are provided also on two orographic grids based on a 10 x 10 digital elevation model (mean altitude of the grid cell, altitude of the central point of the cell). For application purposes all data are available in near real time (data latency less than two hours in standard operation) via the WegenerNet data portal (www.wegenernet.org). Station data and gridded data are visualized (quick-look feature) and prepared for download in common data formats (csv and NetCDF, respectively). Further information on the WegenerNet is available at www.wegcenter.at/wegenernet.

The presentation gives a brief overview of the processing system along the lines above and demonstrates the benefits of the highly resolved WegenerNet data to capture variations in local climate and weather conditions. Selected small-scale extreme events with focus on the highly-variable convective summer precipitation are analyzed, tracking their spatial and temporal development.