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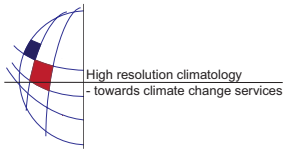

Climatological analysis of precipitation patterns over Mount Baldo (Southern Alps)

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The mountain range of Mount Baldo is an elongated chain in the southern Prealps. Bounded on the western side by Lake Garda, and on the eastern side by the parallel-running deep furrow of the River Adige Valley, the whole Mount Baldo range stretches in the direction southwest-northeast for about 40 km, from the southern highlands of Caprino Veronese up to the elevated saddle joining the surroundings of Rovereto (in the Adige Valley) to the plain of Nago-Torbole (northern shore of Lake Garda).

Mount Baldo displays for most of its length a sharp and uninterrupted crest ridge, mostly running over 2000 m MSL. Its surface covers a variety of altitudinal ranges, from 65 m MSL at the mountain feet, along the Lake Garda shores, to 2,218 m MSL at its highest peak (Cima Valdritta). Furthermore the particular layout of being the southernmost alpine headland, projecting as a balcony over the Po Plain, makes it exposed to the climatic influence of the larger Mediterranean basin. All of these factors concurred to develop a remarkable variety of local microclimates, geographical characters and ecosystems. In particular Mount Baldo is well known for its varied flora, whence it has been named, since 16th century, Hortus Europae (Europe Garden).

Precipitation is one of the key factors characterising the peculiar local climates of Mount Baldo. Various precipitation features can be produced by a variety of processes, including both orographic uplift of moist air advected by synoptic systems, and evaporation and up-slope advection of moist air from Lake Garda or from the Po Plain. Furthermore these effects may variously develop, and even combine, under different meteorological scenarios.

In the present contribution the preliminary results are shown from a research work aiming at retrieving, collecting in a homogeneous dataset and analysing data from 18 weather stations disseminated on Mount Baldo, in order to produce a climatological analysis of precipitation in the area. The whole dataset covers an overall timespan of 145 years (1864-2008), although the various stations have been operated rather discontinuously in it.
The analysis of the 18 time series for the best covered and most representative 60-year time interval (1914-1973) provides an overview of typical annual and seasonal mean values along with their trends.
Correlation analysis between seasonal precipitation totals clearly shows how, especially on the southern part, some stations located on the same side of the mountain are better correlated with respect to other lying closer, but on the opposite side.
The dependence of annual total precipitation amounts on altitude is evaluated and discussed. In particular two different regimes are identified, i. e. below 600 m MSL, where precipitation totals are practically invariant with height, and over 600 m MSL, where totals increase by 130 mm every 100 m.

Suitable mapping of precipitation through Kriging techniques allows to infer the spatial distribution of precipitation under various seasonal and typical weather patterns.

To identify the latter, a selection of 100 precipitation events were classified into 7 typical meteorological scenarios, identified on the basis of synoptic situations on the basis of ECMWF reanalyses. Specific features of each event are evaluated and discussed.

The results provide an example of the appropriate scale required for climatological analysis and mapping of precipitation distribution in an alpine sub-area.