



An optimized weather type classification scheme based on cost733 for italian peninsula.

giulio betti (1,2), roberto vallorani (1,2), gianni messeri (1,2), alfonso crisci (2), bernardo gozzini (2), marco morabito (2), alessandro messeri (3), daniele grifoni (1,2), maurizio iannuccilli (1), giorgio bartolini (1), and giampiero maracchi (4)

(1) LaMMA Consortium, Sesto Fiorentino, Italy, (2) Institute of Biometeorology (CNR - IBIMET), Firenze, Italy, (3) Interdepartmental Centre of Bioclimatology, Firenze, Italy, (4) Geogofili Academy, Firenze, Italy

During the last few decades, circulation weather type' classifications have been widely used to gain insight of the atmospheric processes at the synoptic scale, but also studying the relationship between atmospheric circulation and surface climate variability.

This study aims to evaluate the most performing weather type classification based on COST733 software for the stratification of daily precipitation and surface temperature across Italy. Eight classifications methods (GWT, PCT, CKM, CAP, LIT, SAN, SOM, LND) belonging to the four COST733 groups (threshold-based, PCA-based, leader algorithms and optimization algorithms) were selected from the results of previous works and investigated over about 20 italian historical time series. Weather types were compiled using gridded mean sea level pressure from Reanalysis 1 dataset between 1979 and 2015 and tested only on low number of classes (9,12,18) for operational convenience.

The relationship between circulation weather type classifications and high-impact weather events, such as extreme temperature episodes, floods, droughts or even lightning activity, was proven by many authors.

In this study severe precipitation events were investigated either in terms of occurrences for each weather types, or within-type variations since 1979.

This preliminary study is addressed to implement an operational chain of seasonal forecasting and develop several applications such as water and energy resources management, and severe weather risk prevention.