



Atmospheric circulation classification comparison based on wildfires in Portugal

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Atmospheric circulation classifications are not a simple description of atmospheric states but a tool to understand and interpret the atmospheric processes and to model the relation between atmospheric circulation and surface climate and other related variables (Radan Huth et al., 2008). Classifications were initially developed with weather forecasting purposes, however with the progress in computer processing capability, new and more robust objective methods were developed and applied to large datasets prompting atmospheric circulation classification methods to one of the most important fields in synoptic and statistical climatology. Classification studies have been extensively used in climate change studies (e.g. reconstructed past climates, recent observed changes and future climates), in bioclimatological research (e.g. relating human mortality to climatic factors) and in a wide variety of synoptic climatological applications (e.g. comparison between datasets, air pollution, snow avalanches, wine quality, fish captures and forest fires).

Likewise, atmospheric circulation classifications are important for the study of the role of weather in wildfire occurrence in Portugal because the daily synoptic variability is the most important driver of local weather conditions (Pereira et al., 2005). In particular, the objective classification scheme developed by Trigo and DaCamara (2000) to classify the atmospheric circulation affecting Portugal have proved to be quite useful in discriminating the occurrence and development of wildfires as well as the distribution over Portugal of surface climatic variables with impact in wildfire activity such as maximum and minimum temperature and precipitation.

This work aims to present: (i) an overview the existing circulation classification for the Iberian Peninsula, and (ii) the results of a comparison study between these atmospheric circulation classifications based on its relation with wildfires and relevant meteorological variables. To achieve these objectives we consider the main classifications for Iberia developed within the framework of COST action 733 (Radan Huth et al., 2008). This European project aims to provide a wide range of atmospheric circulation classifications for Europe and sub-regions (<http://www.cost733.org/>) with an ambitious objective of assessing, comparing and classifying all relevant weather situations in Europe.

Pereira et al. (2005) "Synoptic patterns associated with large summer forest fires in Portugal". *Agricultural and Forest Meteorology*, 129, 11-25.

Radan Huth et al. (2008) "Classifications of Atmospheric circulation patterns. Recent advances and applications". *Trends and Directions in Climate Research: Ann. N.Y. Acad. Sci.* 1146: 105–152. doi: 10.1196/annals.1446.019.

Trigo R.M., DaCamara C. (2000) "Circulation Weather Types and their impact on the precipitation regime in Portugal". *Int J of Climatology*, 20, 1559-1581.