



Meteorological stations-based European climatological database for the identification of heat-waves.

Marco Morabito (1,2), Alfonso Crisci (1), Gianni Messeri (1,3), Alessandro Messeri (2,4), Simone Orlandini (2,4), and Giampiero Maracchi (5)

(1) Institute of Biometeorology, National Research Council, Florence, Italy, (2) Centre of Bioclimatology, University of Florence, Florence, Italy, (3) Consortium LaMMA (Laboratory of Monitoring and Environmental Modelling for the Sustainable Development) Sesto Fiorentino, Florence, Italy, (4) Department of Agrifood Production and Environmental Sciences, University of Florence, Florence, Italy, (5) Accademia dei Georgofili, Florence, Italy

There is no universally accepted heat-wave definition. However, from the meteorological point of view, the heat-wave is a relative simple phenomenon that could be physically defined as a persistent anomalous time-bounded pattern of hot and uncomfortable weather conditions. A more rigorous definition also implies the evaluation of the heat-wave characteristics, such as the duration, intensity and timing. Climatological normals are updated every 10 years following the indication of the WMO (World Meteorological Organization), so the heat-wave identification needs to follow this updates and the eventual shifts due to climatic changes. The aim of this work is to give a meteorological station-based heat-wave climatological data (1981-2010) for the main European cities by using the heat-wave approach developed in the EuroHEAT project (Improving Public Health Responses to extreme weather/heat-waves - <http://www.euroheat-project.org/dwd/>). EuroHEAT methodologies can point out the importance of combined biometeorological indexes such as the “Apparent Temperature (AT)” index. Temperature and relative humidity were extracted by the NOAA Global Summary Daily meteorological data performing a quality control and temporal homogeneity check by using the methodology proposed by the European Climate Assessment & Dataset (ECAD). Different heat-wave frequencies and characteristics among the main European cities were observed. All data are presented and visualized in their geographical context throughout maps and spatial info-graphics. This information is very important because the heat-wave is one of the natural hazard with the greatest impact in terms of human mortality, and also represents a critical event triggering other types of disasters both natural and technological. The main finding of this work is the updating of the knowledge of the current heat-wave distribution and characteristics and represents a useful information source especially because the length, frequency and/or intensity of heat-waves are expected to increase over most land areas in Europe in this century.