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Application of the concept of climatologic chart to mediterranean climate variability

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A concept of climatologic chart has been presented in recent communications (European Geophysical Union, Nice 2004 and European Conference on Applied Climatology, Nice 2004).

It expresses itself by a mathematical relation between precipitation and Kelvin temperature. This relation is of biophysical nature, throughout close correlations between these two physical parameters and statistics of wildland fires at monthly range in the same region. The correlations observed with precipitation may be explained by a model using water balance and deep root water uptake of vegetation. The correlation observed with temperature suggests a control by photochemical activation in the Arrhenius sense. The reality of this equation has been verified using classical historic data available through the world. Thus, this concept has been used to study the Mediterranean climate variability.

Different aspects of spatial variability have been examined through the Mediterranean basin: latitude, longitude, altitude, continentality, evolution to semi-arid climate. The climatologic chart of Salamanca, in continental Spain, has been taken as reference

Out of the Mediterranean basin, we gave a particular attention to California, South Africa and West Australia. For these regions, an “hyper-Mediterranean” climate has been characterized with a specific climatologic chart. An interpretation of this particular precipitation-temperature relation is suggested on the basis of root water uptake of vegetation.

Using mean temperature and precipitation data of two consecutive periods of thirty years in West Algeria gives an example of possible climate variability. In a more general point of view climatic evolution of a region may be quantified by extending the

temperature-precipitation relation to multiannual series of data