Analysis of 21st Century Monthly temperature in Basque Country

Gaztelumendi S.1,2*, Egaña J.1,2, Hernandez R.1,2

1- Basque Meteorology Agency (Euskalmet).
2- Meteorology Area, Energy and Environment Division, Tecnalia R&I.

Abstract

This contribution dealt on observed mean regional climate, and particularly in temperature monthly behavior during twenty years in the Basque Country, as an extension of the north part of Iberian Peninsula. We present some statistical data, including monthly maxima and minima, as well as the maximum and minimum monthly temperature in order to a better explanation of the 21st century behavior. The nonparametric Mann-Kendall test, which includes the coexistence of different reference periods due to the slowdown of the mobile pressure systems. Summers shows a positive anomaly of 0.55ºC. The winter months show a negative anomaly of -0.12ºC. The main findings during this study period are presented.

Introduction

Is a extended practice in many Weather Services (WMS), the regular (monthly, seasonal and yearly) publications of weather summaries or reports. These documents are one of the most important sources of information, from the climatic point of view, in the daily work of WMS. We present some statistical data, including monthly maxima and minima, as well as the maximum and minimum monthly temperature in order to a better explanation of the 21st century behavior.

Methodology

Results and Discussion

ANOMALIES:

For analysis and discussion, data are presented in two tables with calendar format and colors showing cold and warm departures from the long-term mean (Mann-Kendall (MK) test) and also some influence from the slowdown of the mobile atmospheric pressure systems. The basic monthly, seasonal and annual asymmetries of temperature, rainfall and solar radiation determined provide seasonal patterns of popular comments about abnormal climate.

As winter 2013-2014 when few snow events registered but high number of warm events.

Relevant anomalies.

In 2014 and 2015, we notice some consideable anomalies of temperature, rainfall and solar radiation (Table 1). The general behavior of the temperature (Fig. 1) is similar to the climatological (Table 2). This is possible due to some influence from the slowdown of the mobile atmospheric pressure systems. Summers shows a positive anomaly of 0.55ºC. The winter months show a negative anomaly of -0.12ºC. The main findings during this study period are presented.

2010 2011 2012 2013 2014 2015

 winters were really warm with high positive anomalies especially during February and December and back to the 19th century levels; other relevant anomalies are produced, which usually more than one or two relevant events each spring occurs. Also highlight the cold wave in February 2015 that occurs during the first half of the month, one of the cold waves more relevant in Europe, although it is from the warmest cold wave of February 1995. This cold wave is responsible for a negative anomaly of around -3 ºC. Recent winters have been particularly warm. Highlighting the version of 2013-2014, with very few snow or cold events.

Different behaviors can be observed during these seasons are dynamically very active with high influence of different aggregation methods (weekly, monthly, seasonal and yearly, seasonal and yearly), for the whole territory. (Fig. 1 and 2 for SL) and rainfall.”

For the whole period 2010-2015, there are significant differences in temperature and rainfall with respect to the 2006-2010 period, for both positive and negative anomalies. The main findings during this study period are presented.

On the other hand, the study period is an extension of the climatological period, and due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks, due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks, due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks.

The main characteristic of this study period is an extension of the climatological period, and due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks, due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks.

The main characteristic of this study period is an extension of the climatological period, and due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks, due to observed temperatures and 71ºC-75ºC in July and August show a large quadrant of peaks.

Acknowledgements

The authors would like to thank the Emergencies and Meteorology Directorate - Security Department - Basque Government for public provision of data and operational service financial support., and also our Euskalmet colleagues for their daily effort in promoting valuable services for the Basque Country. We also would like to thank open-data (particularly data providers in the ECAD project) and free software community (particularly developers) for his contribution to technical and scientific advance.