CLIMATE SERVICES FOR MONITORING THE RECENT EVOLUTION OF CLIMATE IN MURCIA REGION

Elisa Mª Hernández y Luis Mª Bañón

Delegación Territorial en Murcia. AEMET. (ehernandezg@aemet.es, lbanonp@aemet.es)

According to the Climate Watch System from World Meteorological Organization (WMO), a "Climate Watch", based on observations of current and/or future climate anomalies, can serve as a mechanism to warn the user community that a significant climate anomaly exists or might develop. In this respect, climate observations are necessary in real and historical time in order to monitor and predict effectively climate extremes.

Regarding to this Climate Watch System, we have developed graphical products which show the evolution of climate in "real time". These products seem to be very useful for attention to media, as input for other climate services, for the user community, etc.

Graphics products show thermal and pluviometric information, and the general procedure is based on three modules: climatological data, recent past data and forecasted data.

The climatological data module is based on historical daily series from 25 automated weather stations (AWS) located in Murcia Region. These 25 AWS were selected from a homogenised and filled daily database (Climatol R package) among 83 Murcia Region stations. Statistics from 1981-2010 historical series were obtained for each of the 25 AWS daily database and for a regional daily database.
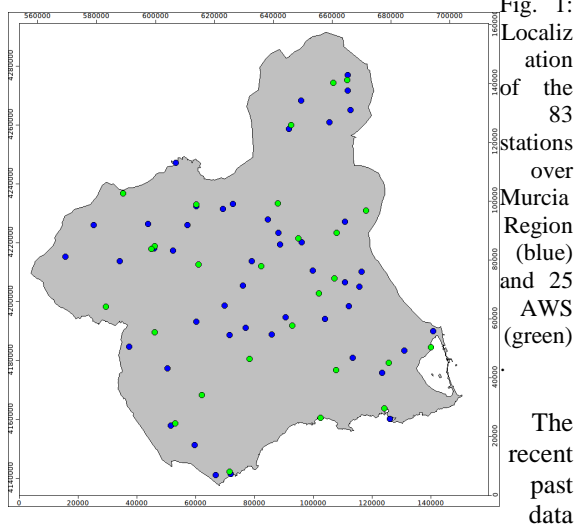

Fig. 1: Localization of the 83 stations over Murcia Region (blue) and 25 AWS (green).

The recent past data module obtains the last 30 days observations data of these 25 AWS, from AEMET database, and works out daily regional values.

The forecasted data module obtains similar information for the next seven days forecasted (ECMWF): from 25 AWS and regional daily values. This module is useful to know the monthly temperature and the thermometric character of the month before the month ends. From the day 25th, the monthly temperature is worked out using observed data to the previous day and forecasted data until the last day of the month.

Afterwards, recent past and forecasted files are joined obtaining 40 days files for each of the 25 AWS and for regional level.

Graphics products show the last 30 days observed data and statistic from historical data of temperature and precipitation values with indication of the character. At the same time, graphics products show the next seven days forecasted values with indication of the character (Figure 2). Similar graphics have been built for monthly (Figure 3) and annual data (Figure 4).
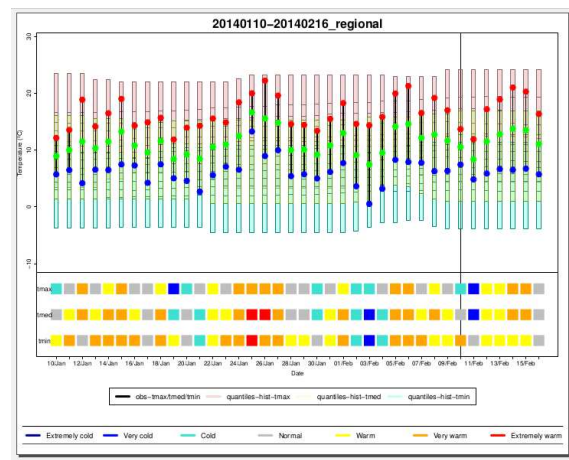

Fig. 2: Daily regional evolution of temperatures in Murcia Region and thermometric character for every day.

In Figure 2, the recent past data (D-30) and forecasted data (D+7) are shown as vertical lines in black, where maximum temperatures are represented as points in red, mean temperatures in green and minimum temperatures in blue. Below these data, the climatological data are shown as boxplots for maximum (pink), mean (green) and minimum temperatures (blue). Moreover, the thermometric character of every day is represented in boxes of different colours, according to the character, which varies from red (extremely warm) to blue (extremely cold).
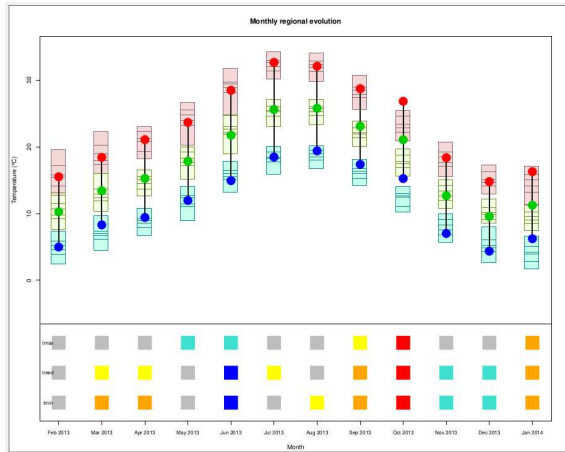
Fig. 3: Monthly regional evolution of temperatures and their thermometric character in Murcia Region.

In Figure 3, the monthly regional evolution of temperatures from the last 12 months is shown. The recent past data (M-12) and climatological data are represented as in Figure 2. The thermometric character of every month has been estimated and is shown as in Figure 2.
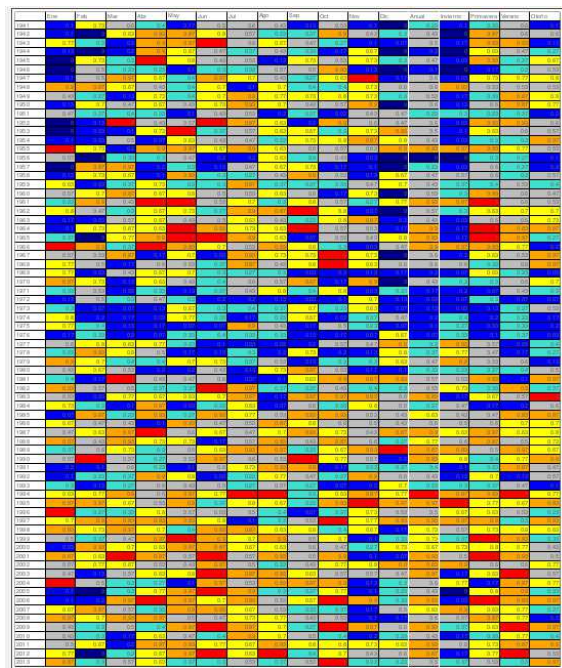

Fig. 4: Thermometrical character of mean temperatures for monthly, annual and seasonal scales in Murcia Reigon for the period 1941-2013.

In Figure 4, the thermometrical character of mean temperatures of every month from January 1941 to December 2013 was worked out, as well as the thermometric character for every year and seasonal scale. The character varies from red (extremely warm) to blue (extremely cold).

Currently, we are working in precipitation data and developing some graphical products. One of them

shows the daily values of precipitation observed in both each AWS and regional scale, for current and previous months. Moreover, this product shows, for each day, the median and maximum values, as well as the number of days of precipitation in the reference period (1981-2010).

As in temperature, the values of forecasted precipitation for the next seven days (given by the ECMWF) are included in this product. These values let to calculate the monthly precipitation and its pluviometric character before the month ends (from the 25th onward).

This graphical product is complemented with others that show accumulated precipitation of the current and previous month as well as the accumulated value of precipitation and their pluviometric character.

For a regional scale, it has been developed a graphical product of monthly precipitation which shows the accumulated value of precipitation for the last 12 months and its pluviometric character.

Furthermore, it shows a graphic with the evolution of the accumulated precipitation for the last 3 months with information of the pluviometric character.

Finally, it is developing a graphic with the regional daily precipitations for the current hidrological year which in addition shows the accumulated precipitation and the percentage over the total annual that this value represents.

REFERENCIAS

BRENNING, A. 2011. Package RSAGA.

GUIJARRO, J.A. 2011. User´s guide to Climatol.

WMO, 2006. Climate Watch System. Early Warning against Climate Anomalies and Extremes.