



Observed climatic trends in the Pyrenees (1950-2015)

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Many studies have investigated the climate variability of specific areas in the Pyrenees. However, due to the complexity of obtaining data from three different countries, a study of the Pyrenees as a whole was still missing. Here, for the first time and under the framework of the CLIM'PY project, scientists from Spain, France and Andorra are working together to create a common temperature and precipitation database. We collected 1,495 precipitation and 1,331 temperature series of both sides of the mountain range to create: 1) a high-resolution gridded dataset (1x1 km) including daily data for the period 1981-2015; and 2) a long-term monthly dataset based on 61 temperature and 119 precipitation homogenized series for the period 1950-2015. Then, we calculated the annual, seasonal and monthly trends. Likewise, we computed a set of 27 extreme precipitation and temperature indices from the World Meteorological Organization, as well as their trends, to assess the spatial distribution and long-term variability of the climate in the Pyrenees.

Overall, we discovered an increase of both annual (0.2 °C/decade) and seasonal temperature, especially in spring and summer (0.3 °C/decade), and a slight decrease in precipitation (-1.8 %/decade), although in general not significant and including a high spatial variability. This decrease is significant, however, in the southernmost side and can be seen in the spatial distribution of all daily and extreme indices of precipitation.

This study represents the first step to assess the impacts of climate change in the whole Pyrenees, helping achieve a better management of a territory that highly depends on climate (tourism, agriculture, etc.) and with a great ecological diversity.