

BEL-HORNET

Belgian homogenized long-term reference climate time series

DURATION
15/12/2015 – 15/03/2018

BUDGET
255.386 €

PROJECT DESCRIPTION

Long-term, high-quality and reliable instrumental climate records are indispensable pieces of information required for undertaking robust and consistent studies to better understand, detect, predict and respond to global climate variability and change. Accurate and homogeneous climate data are also indispensable for the calculation of related statistics that are needed and used to define the state of climate and climate extremes. Moreover, the development of the most appropriate environmental and societal climate change adaptation and mitigation strategies also requires high quality climate data. In this latter context, scientists, decision makers and application communities require the best data for their particular needs.

Huge amounts of climate data have been recorded since the earliest observational days in Belgium (i.e. instrumental data extend back in time at least to the 19th century over most regions of the country). However, the existing data heritage is largely under-exploited because historical information still remained in hard copy and in fragile media (e.g. data hand-written kept in the original daily weather reports). Easily accessible digital climate data are mostly restricted to the second half of the 20th century. Thanks to a digitization project financed by the Belgian Federal Scientific Policy (BELSPO), the Royal Meteorological Institute of Belgium (RMI) has undertaken data rescue activities aiming at transferring historical climate records from paper forms to new media (i.e. digital forms).

However, it is well known that long climatological time series often contain variations that are not only due to the vagaries of the weather or climate. Mostly these variations are related to non-climatic factors such as the introduction of new instrumentation, relocation of weather stations, changes in exposure of instruments or in observing practices, modification of the environment surrounding the meteorological stations, etc. At the same time, wrong or aberrant observations are common in most observational systems. All these factors reduce the quality of original data and compromise their homogeneity.



Fig 1: An illustration of a change in the measurement conditions: different types of meteorological shelters (semi-open, closed) have been used since the end of the 19th century in the climatological park in Uccle.

BEL-HORNET

These non-climatic factors affecting the meteorological records make these data less suitable for the assessment of actual climate variations through the reduced reliability of the time series. In addition, since biases in time series can have a similar magnitude as the climate signal (i.e. long-term variations, trends or cycles), the use of uncorrected data might lead to misinterpretations about the evolution of the climate. Therefore the identification and correction of these aberrant observations and non-climatic factors is essential before any reliable climate study can be carried out for a meaningful assessment of changes in climate.

The objective of this project is therefore to produce long-term high quality and homogeneous climate records for Belgium based on the meteorological records archived at RMI. The considered meteorological parameters are precipitation (daily amount) and daily temperature extremes (i.e. daily minimum and maximum) as they are the main variables of interest for climate applications.

CONTACT INFORMATION

Coordinator

Cédric BERTRAND

Royal Meteorological Institute of Belgium (RMI)
 Meteorological and Climatological Information
cedric.bertrand@meteo.be

Partners

Hichem SAHLI

Vrije Universiteit Brussel (VUB)
 Electronics & Informatics department
hsahli@vub.be

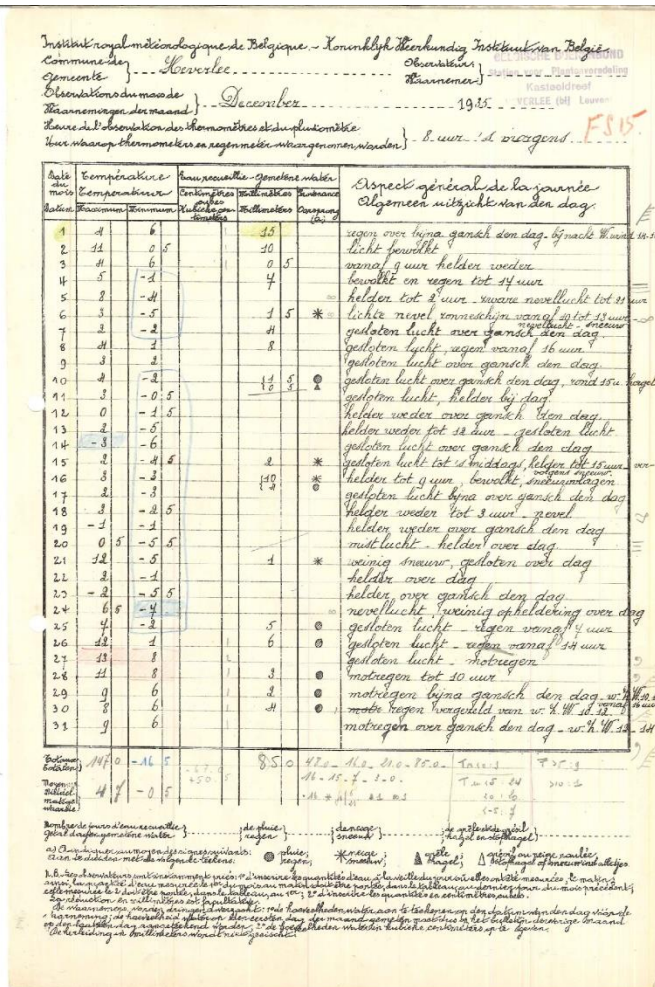


Fig 2: Illustration of the climatological bulletin on December 1935 for the Heverlee station.