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 nonclimatic 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.

nstitut noyal metecondocique de Belgieue - Xo commente Coverlee - Meoustions du mass de Reanensementes de kommenteres et du plutions tenen du bevoukten des kommenteres et du plutions twee waarop thermoneteres as agementer waaropen									Barnemer-) Staten um Phalamardali Kastooldreet 1945 - VERLEE (eff Lauren	
aqte	bempérakure				bau recusitie - gemetere water					Asnect séries de la isance
	Econporation			m	Hubiche on 15		Billimoters Conspron		Constant	algemeen uitzüht van den dag.
	đ		6		tematics	+	15	1	(2; 0	seven men himo can the day to a lit . I W
2	11			5			10			regen over lijna ganch den dag. bij nacht W. w.
3	H		6				0	5		vanal quur helder weder
4	5		-1				4			vanaf guur helder weder bewolkt en regen tot 14 uur
5	8		- #				1		50	helder tot & un sware nevellucht lot &
6	3		- 5			1	. 1	5	* .	lichte nevel ronneschijn vangl so tot 1800
7	2		-2		1	-	Н	-		lichte nevel ronneschijn vangl getot 18 un geslaten lucht over gansch den dag
8	H		3	-		1	8		-	gestoten lucht ugen vanaf 16 un
9	3	-	2			1				gestoten lucht over gansch den dag
10	#	-	-2	-		1	11	55	9	gestaten lucht over gansch den dag, rond 15 u
11_	3	+	- 0	5		-				gestoten lucht, helder bij dag.
12	0		- 1	5		-				helder weder over gansch Usen dag.
13	1	-	-5							helder weder for 12 aun _ gesloten lucht.
14	- 3	-	-6					-		gestoten lucht over gansch den dag
15	1 20	-		5		-1	2		*	gesloten lucht tot is middags, helder tot 15 un
16	2	-	- 3			1	140		*	helder tot gun, bewolkt, snewymagen
17-	. 3			5						gesloten lucht byna over gansch den do
18	-1		-1	0		1			-	helder weder tot 3 un pevel
19 20	0	5	-5	5				1	2	helden weder over gansch den dag mistlucht . helder over dag.
21	12		- 5	-			1		*	weinig snown, gestoten over dag
22	2		-1				-			helder over dag
20-	- 2			5		1		-	1	helder over gansch den dag
24	6	5	-4				_		60	nevellucht weinig opheldering over
25	4		-4-2		1		5		0	gestoten lucht - regen vanaf y wer
26	12		1				6		0	gestoten lucht - reden vanal 14 uur
27	13	-	- 8			-			-	gestoten lucht - notregen
28	11	-	8			4	3		0	motregen tot 10 uur
29	9		6			1	2	-	0	motregen bijna gansch den dag wi mote regen vergeseld van w. H. W 10.12
30	8		6			-	H	-	0,	mobe regen wergesteld van w. H. W. 18. 12
31	9		6							motregen over gansch den dag - w. h. W.
E.P.	1	-				+	8-	-		<u>i</u> / / /
otaton	3 141	0	-16	1	- 67.0		82	0		160- 21.0-25.0- Tasais 725-19
Fleid	14	1	-0	5	+50.1				Contraction of	5-7-3-0. Turis 24 510:2
handle	9	18	4	-	1 1	1		1	. 4 * 4	a 10 10 10 10 10 10 10 10 10 10 10 10 10
ophie	rde jours	dies	mixecus	die	1		de phice	1		tenesse; de arzleskie mil
Weald	afery	erriad	one winds	Sr.	3	-	ragen	3-	}	sneard)
san.	le didid	11/12	umoyen,	de la	nionesmin meterteeken	and si	a: O	phi	ie; ÷	Konedin; A grille ; A grien on reige soulier
dem dem	d service and service outree l outron anons lga fill	kenn kelle a 2 d n en jose jose	o sometrin d'erre m oilighe s rollind Norden haestelle	a south a single	monte pres ince le pres see, dans le vo est fapul ingent d'are infertierop ekend ope	in the state	"d'unserie nois au deau, au ape. abet: rod noerstar no 2° de	nal in house	3 2° d'in avectures of chiles avectures of alledon	La sage :

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

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



BELGIAN SCIENCE POLICY OFFICE

Louizalaan 231 Avenue Louise • B-1050 Brussels Tel. +32 (0)2 238 34 11 http://www.belspo.be/brain-be/ • Email : BRAIN-be@belspo.be