Statistiques des précipitations extrêmes des communes belges

Binche (INS 56011)

1. Niveau de retour estimé pour une durée de précipitations de 10 minutes à 30 jours (lignes) et une période de retour de 2 à 200 années (colonnes). Unités : mm.

	Période de retour (années)											
Durée	**2**	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**75**	**100**	**200**
10 min	7.7	11.0	13.5	15.1	16.2	17.1	17.8	19.1	20.0	21.9	23.3	26.8
20 min	11.1	16.0	19.7	21.9	23.6	24.9	26.0	27.7	29.1	31.8	33.8	38.9
30 min	13.2	19.1	23.6	26.3	28.3	29.9	31.2	33.3	35.0	38.3	40.7	46.8
1 h	16.3	23.0	27.9	30.9	33.1	34.8	36.3	38.6	40.5	44.1	46.7	53.4
2 h	19.6	27.1	32.6	36.0	38.5	40.4	42.1	44.7	46.8	50.8	53.7	61.2
3 h	21.7	29.9	36.0	39.7	42.3	44.5	46.3	49.1	51.4	55.8	58.9	67.1
6 h	26.3	34.6	40.8	44.5	47.2	49.4	51.2	54.1	56.4	60.8	64.0	72.2
12 h	32.1	42.1	49.4	53.9	57.1	59.7	61.8	65.3	68.0	73.2	77.0	86.6
1 j	39.2	50.7	59.0	63.9	67.4	70.2	72.5	76.2	79.2	84.7	88.7	98.7
2 j	49.9	63.8	73.5	79.2	83.2	86.4	89.1	93.2	96.5	102.6	107.0	118.0
3 j	53.3	68.1	78.3	84.2	88.4	91.7	94.4	98.7	102.1	108.3	112.8	123.8
4 j	58.0	73.8	84.6	90.8	95.2	98.7	101.5	105.9	109.4	115.8	120.4	131.7
5 j	65.8	82.9	94.6	101.3	106.0	109.6	112.6	117.4	121.1	127.8	132.7	144.5
7 j	76.0	94.5	107.0	114.1	119.1	122.9	126.1	131.1	134.9	142.0	147.0	159.2
10 j	90.5	111.6	125.6	133.5	139.0	143.3	146.8	152.2	156.5	164.2	169.6	182.7
15 j	109.7	134.3	150.3	159.3	165.6	170.4	174.3	180.5	185.2	193.7	199.7	214.1
20 j	127.8	156.5	175.0	185.4	192.6	198.1	202.5	209.5	214.8	224.4	231.2	247.3
25 j	136.5	166.9	186.5	197.4	204.9	210.6	215.3	222.5	228.0	238.0	245.0	261.5
30 j	159.3	191.9	212.7	224.2	232.1	238.2	243.1	250.7	256.5	266.9	274.2	291.4

2. Niveau de retour estimé et écart-type de l'estimation pour une durée de précipitations de 10 minutes à 30 jours (lignes) et une période de retour de 2 à 200 années (colonnes). Unités : mm.

Durée	Période de retour (années)											
	2	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**75**	**100**	**200**
10 min	7.7	11.0	13.5	15.1	16.2	17.1	17.8	19.1	20.0	21.9	23.3	26.8
	0.2	0.4	0.5	0.7	0.8	0.9	1.0	1.2	1.4	1.7	2.0	2.7
20 min	11.1	16.0	19.7	21.9	23.6	24.9	26.0	27.7	29.1	31.8	33.8	38.9
	0.4	0.6	0.8	1.0	1.2	1.4	1.5	1.8	2.0	2.4	2.8	3.8
30 min	13.2	19.1	23.6	26.3	28.3	29.9	31.2	33.3	35.0	38.3	40.7	46.8
	0.4	0.6	0.8	1.0	1.2	1.3	1.4	1.6	1.8	2.1	2.4	3.2
1 h	16.3	23.0	27.9	30.9	33.1	34.8	36.3	38.6	40.5	44.1	46.7	53.4
	0.5	0.8	1.1	1.3	1.6	1.8	1.9	2.2	2.5	3.0	3.4	4.6
2 h	19.6	27.1	32.6	36.0	38.5	40.4	42.1	44.7	46.8	50.8	53.7	61.2
	0.6	0.9	1.3	1.6	1.8	2.0	2.2	2.5	2.8	3.4	3.9	5.2
3 h	21.7	29.9	36.0	39.7	42.3	44.5	46.3	49.1	51.4	55.8	58.9	67.1
	0.7	1.0	1.3	1.6	1.8	2.0	2.1	2.4	2.7	3.2	3.6	4.8
6 h	26.3	34.6	40.8	44.5	47.2	49.4	51.2	54.1	56.4	60.8	64.0	72.2
	0.8	1.0	1.4	1.7	2.0	2.2	2.4	2.9	3.2	3.9	4.5	6.2
12 h	32.1	42.1	49.4	53.9	57.1	59.7	61.8	65.3	68.0	73.2	77.0	86.6
	1.1	1.4	1.9	2.3	2.7	3.0	3.3	3.9	4.3	5.3	6.1	8.3
1 j	39.2	50.7	59.0	63.9	67.4	70.2	72.5	76.2	79.2	84.7	88.7	98.7
	1.3	1.6	1.8	2.1	2.3	2.4	2.6	2.8	3.1	3.6	3.9	5.0
2 j	49.9	63.8	73.5	79.2	83.2	86.4	89.1	93.2	96.5	102.6	107.0	118.0
	2.0	2.6	3.2	3.6	4.0	4.3	4.6	5.1	5.5	6.3	7.0	8.8
3 j	53.3	68.1	78.3	84.2	88.4	91.7	94.4	98.7	102.1	108.3	112.8	123.8
	2.5	3.2	3.9	4.3	4.7	5.1	5.3	5.8	6.2	7.0	7.7	9.4
4 j	58.0	73.8	84.6	90.8	95.2	98.7	101.5	105.9	109.4	115.8	120.4	131.7
	2.9	3.6	4.2	4.6	4.9	5.1	5.4	5.8	6.1	6.8	7.3	8.7
5 j	65.8	82.9	94.6	101.3	106.0	109.6	112.6	117.4	121.1	127.8	132.7	144.5
	3.4	4.1	4.7	5.2	5.5	5.7	5.9	6.3	6.6	7.3	7.8	9.1
7 j	76.0	94.5	107.0	114.1	119.1	122.9	126.1	131.1	134.9	142.0	147.0	159.2
	4.1	4.8	5.4	5.8	6.1	6.3	6.5	6.8	7.1	7.7	8.1	9.2
10 j	90.5	111.6	125.6	133.5	139.0	143.3	146.8	152.2	156.5	164.2	169.6	182.7
	5.1	6.3	7.1	7.6	8.0	8.3	8.6	9.0	9.3	9.9	10.4	11.7
15 j	109.7	134.3	150.3	159.3	165.6	170.4	174.3	180.5	185.2	193.7	199.7	214.1
	6.3	7.6	8.5	9.0	9.3	9.6	9.8	10.1	10.4	10.9	11.3	12.3
20 j	127.8	156.5	175.0	185.4	192.6	198.1	202.5	209.5	214.8	224.4	231.2	247.3
	7.4	9.0	10.1	10.7	11.1	11.5	11.7	12.2	12.5	13.2	13.6	14.9
25 j	136.5	166.9	186.5	197.4	204.9	210.6	215.3	222.5	228.0	238.0	245.0	261.5
	8.3	10.1	11.4	12.2	12.8	13.2	13.6	14.2	14.7	15.7	16.4	18.3
30 j	159.3	191.9	212.7	224.2	232.1	238.2	243.1	250.7	256.5	266.9	274.2	291.4
	9.1	11.0	12.5	13.4	14.1	14.6	15.1	15.9	16.5	17.7	18.6	21.1

3. Intervalle de confiance à 95% de la période de retour estimée pour une durée de précipitations de 10 minutes à 30 jours (lignes) et une période de retour de 2 à 200 années (colonnes). Unités : mm.

Durée	Période de retour (années)											
	2	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**75**	**100**	**200**
10 min	7.3	10.3	12.5	13.7	14.6	15.2	15.8	16.7	17.3	18.5	19.4	21.4
	8.1	11.7	14.6	16.4	17.8	18.9	19.9	21.5	22.8	25.2	27.1	32.1
20 min	10.5	14.9	18.1	19.9	21.2	22.2	23.0	24.3	25.2	27.1	28.4	31.5
	11.8	17.1	21.3	24.0	25.9	27.6	28.9	31.2	33.0	36.6	39.2	46.3
30 min	12.3	17.9	21.9	24.3	26.0	27.3	28.4	30.2	31.6	34.1	36.0	40.6
	14.0	20.3	25.2	28.3	30.6	32.4	33.9	36.5	38.5	42.4	45.4	53.1
1 h	15.4	21.4	25.7	28.2	30.0	31.4	32.5	34.3	35.7	38.2	40.0	44.3
	17.3	24.5	30.0	33.5	36.1	38.2	40.0	43.0	45.4	49.9	53.4	62.5
2 h	18.5	25.3	30.1	32.9	34.9	36.5	37.7	39.7	41.3	44.1	46.1	51.0
	20.7	28.9	35.1	39.1	42.0	44.4	46.4	49.7	52.3	57.5	61.3	71.5
3 h	20.4	28.0	33.4	36.6	38.9	40.6	42.1	44.4	46.2	49.5	51.8	57.7
	23.1	31.8	38.5	42.7	45.8	48.3	50.4	53.9	56.7	62.0	66.0	76.5
6 h	24.7	32.6	38.1	41.2	43.4	45.1	46.4	48.5	50.1	53.1	55.1	59.9
	27.9	36.6	43.5	47.8	51.1	53.7	56.0	59.7	62.7	68.5	72.9	84.4
12 h	30.0	39.3	45.7	49.3	51.8	53.8	55.3	57.7	59.5	62.8	65.1	70.4
	34.3	44.9	53.1	58.4	62.4	65.6	68.3	72.8	76.5	83.5	88.8	102.9
1 j	36.6	47.6	55.3	59.8	63.0	65.4	67.5	70.7	73.1	77.7	80.9	88.9
	41.9	53.8	62.6	67.9	71.8	74.9	77.6	81.8	85.2	91.6	96.4	108.5
2 j	45.9	58.7	67.3	72.1	75.4	78.0	80.0	83.3	85.8	90.2	93.3	100.7
	54.0	68.8	79.7	86.3	91.1	94.9	98.1	103.2	107.3	115.0	120.7	135.2
3 j	48.3	61.8	70.7	75.7	79.2	81.8	84.0	87.3	89.9	94.5	97.7	105.4
	58.3	74.4	85.9	92.7	97.7	101.7	104.9	110.2	114.3	122.1	127.8	142.1
4 j	52.2	66.7	76.4	81.9	85.7	88.6	90.9	94.6	97.5	102.6	106.2	114.6
	63.8	80.8	92.7	99.7	104.8	108.7	112.0	117.3	121.4	129.1	134.7	148.7
5 j	59.2	74.8	85.3	91.2	95.3	98.4	101.0	105.0	108.1	113.6	117.5	126.6
	72.5	91.1	103.9	111.3	116.7	120.9	124.3	129.8	134.1	142.1	147.9	162.3
7 j	68.0	85.0	96.3	102.7	107.2	110.6	113.3	117.7	121.0	127.0	131.2	141.2
	84.0	104.0	117.6	125.4	131.0	135.3	138.9	144.5	148.9	157.0	162.8	177.2
10 j	80.5	99.3	111.6	118.5	123.3	127.0	130.0	134.7	138.2	144.7	149.1	159.7
	100.6	123.9	139.5	148.4	154.7	159.6	163.5	169.8	174.7	183.7	190.1	205.7
15 j	97.4	119.3	133.7	141.7	147.3	151.6	155.1	160.6	164.7	172.3	177.5	190.0
	122.0	149.2	166.9	176.9	183.9	189.2	193.5	200.4	205.6	215.1	221.9	238.1
20 j	113.3	138.8	155.2	164.4	170.7	175.6	179.5	185.6	190.3	198.6	204.5	218.1
	142.3	174.2	194.8	206.4	214.4	220.5	225.5	233.3	239.4	250.2	257.9	276.4
25 j	120.2	147.1	164.1	173.5	179.9	184.7	188.6	194.6	199.1	207.2	212.8	225.6
	152.7	186.7	208.9	221.3	229.9	236.5	241.9	250.4	256.9	268.8	277.2	297.4
30 j	141.4	170.2	188.2	198.0	204.6	209.5	213.5	219.6	224.2	232.2	237.7	250.1
	177.2	213.5	237.1	250.4	259.7	266.8	272.6	281.8	288.9	301.7	310.8	332.7

4. Estimation des coefficients de Montana.
Formule de Montana : intensité[mm/h] = a . durée[min]$^{-b}$ pour une plage de durées
a_1, b_1 : durées < 25 min
a_2, b_2 : durées entre 25 min et 6000 min (= 100 h)
a_3, b_3 : durées > 6000 min (= 100 h)

Période de retour (années)	a_1	b_1	a_2	b_2	a_3	b_3
2	135.8	0.4683	301.9	0.7165	52.0	0.5144
5	193.7	0.4660	469.5	0.7410	76.8	0.5330
10	235.7	0.4624	603.9	0.7547	99.1	0.5470
15	260.7	0.4599	689.3	0.7619	114.3	0.5554
20	278.9	0.4580	753.6	0.7668	126.1	0.5613
25	293.2	0.4564	805.8	0.7704	136.0	0.5660
30	305.1	0.4551	850.0	0.7734	144.6	0.5698
40	324.3	0.4529	923.0	0.7779	159.2	0.5759
50	339.4	0.4512	982.3	0.7813	171.4	0.5806
75	367.7	0.4479	1096.9	0.7875	195.7	0.5893
100	388.4	0.4455	1183.8	0.7917	214.8	0.5955
200	440.6	0.4395	1414.3	0.8018	268.2	0.6107

Références

Van de Vyver, H. (2012). Spatial regression models for extreme precipitation in Belgium, Water Resour. Res., 48, W09549, doi :10.1029/2011WR011707.

Van de Vyver, H. (2013). Practical return level mapping for extreme precipitation in Belgium, RMI scientific and technical publication 062, 30 pages.