



Statistiques des précipitations extrêmes des communes belges

Beauvechain (INS 25005)

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.

| Durée | Période de retour (années) | | | | | | | | | | | |
|--------|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2 | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 200 |
| 10 min | 7.4 | 10.7 | 13.1 | 14.6 | 15.7 | 16.6 | 17.3 | 18.5 | 19.4 | 21.2 | 22.6 | 26.0 |
| 20 min | 10.6 | 15.1 | 18.6 | 20.6 | 22.2 | 23.4 | 24.4 | 26.1 | 27.4 | 29.9 | 31.7 | 36.5 |
| 30 min | 12.6 | 18.2 | 22.5 | 25.1 | 27.0 | 28.5 | 29.8 | 31.8 | 33.5 | 36.6 | 38.8 | 44.7 |
| 1 h | 15.6 | 21.6 | 26.2 | 28.9 | 30.9 | 32.5 | 33.9 | 36.1 | 37.8 | 41.1 | 43.5 | 49.7 |
| 2 h | 18.5 | 25.4 | 30.5 | 33.6 | 35.8 | 37.6 | 39.1 | 41.6 | 43.5 | 47.2 | 49.9 | 56.7 |
| 3 h | 20.5 | 28.3 | 34.0 | 37.4 | 40.0 | 42.0 | 43.7 | 46.4 | 48.6 | 52.6 | 55.6 | 63.3 |
| 6 h | 24.8 | 33.0 | 39.0 | 42.7 | 45.3 | 47.5 | 49.2 | 52.1 | 54.4 | 58.6 | 61.8 | 69.8 |
| 12 h | 30.0 | 39.8 | 47.1 | 51.5 | 54.7 | 57.2 | 59.4 | 62.8 | 65.5 | 70.6 | 74.4 | 83.9 |
| 1 j | 35.9 | 47.2 | 55.3 | 60.1 | 63.6 | 66.3 | 68.6 | 72.3 | 75.2 | 80.5 | 84.5 | 94.4 |
| 2 j | 44.6 | 57.7 | 66.9 | 72.3 | 76.1 | 79.2 | 81.6 | 85.6 | 88.7 | 94.5 | 98.7 | 109.1 |
| 3 j | 46.8 | 60.5 | 70.0 | 75.5 | 79.4 | 82.4 | 85.0 | 89.0 | 92.1 | 97.8 | 102.0 | 112.2 |
| 4 j | 50.5 | 65.0 | 74.9 | 80.7 | 84.7 | 87.9 | 90.5 | 94.6 | 97.8 | 103.7 | 107.9 | 118.3 |
| 5 j | 57.2 | 72.6 | 83.2 | 89.2 | 93.5 | 96.8 | 99.5 | 103.8 | 107.1 | 113.2 | 117.6 | 128.2 |
| 7 j | 65.3 | 82.1 | 93.3 | 99.7 | 104.3 | 107.8 | 110.6 | 115.1 | 118.6 | 125.0 | 129.5 | 140.5 |
| 10 j | 77.2 | 95.3 | 107.3 | 114.1 | 118.9 | 122.6 | 125.6 | 130.3 | 133.9 | 140.6 | 145.2 | 156.5 |
| 15 j | 93.3 | 114.5 | 128.4 | 136.2 | 141.7 | 145.9 | 149.2 | 154.6 | 158.7 | 166.0 | 171.2 | 183.7 |
| 20 j | 108.6 | 133.2 | 149.1 | 158.0 | 164.2 | 168.9 | 172.7 | 178.7 | 183.3 | 191.6 | 197.4 | 211.2 |
| 25 j | 114.8 | 141.1 | 158.0 | 167.3 | 173.8 | 178.7 | 182.7 | 189.0 | 193.8 | 202.3 | 208.3 | 222.6 |
| 30 j | 135.4 | 163.9 | 182.2 | 192.3 | 199.2 | 204.5 | 208.8 | 215.5 | 220.6 | 229.7 | 236.1 | 251.2 |

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 | 7.4 | 10.7 | 13.1 | 14.6 | 15.7 | 16.6 | 17.3 | 18.5 | 19.4 | 21.2 | 22.6 | 26.0 |
| | 0.2 | 0.3 | 0.5 | 0.7 | 0.8 | 0.9 | 1.0 | 1.2 | 1.3 | 1.7 | 1.9 | 2.6 |
| 20 min | 10.6 | 15.1 | 18.6 | 20.6 | 22.2 | 23.4 | 24.4 | 26.1 | 27.4 | 29.9 | 31.7 | 36.5 |
| | 0.3 | 0.5 | 0.7 | 0.9 | 1.1 | 1.2 | 1.3 | 1.5 | 1.7 | 2.1 | 2.4 | 3.3 |
| 30 min | 12.6 | 18.2 | 22.5 | 25.1 | 27.0 | 28.5 | 29.8 | 31.8 | 33.5 | 36.6 | 38.8 | 44.7 |
| | 0.4 | 0.6 | 0.9 | 1.1 | 1.3 | 1.4 | 1.6 | 1.8 | 2.0 | 2.3 | 2.6 | 3.5 |
| 1 h | 15.6 | 21.6 | 26.2 | 28.9 | 30.9 | 32.5 | 33.9 | 36.1 | 37.8 | 41.1 | 43.5 | 49.7 |
| | 0.4 | 0.8 | 1.1 | 1.4 | 1.6 | 1.8 | 2.0 | 2.3 | 2.5 | 3.0 | 3.4 | 4.6 |
| 2 h | 18.5 | 25.4 | 30.5 | 33.6 | 35.8 | 37.6 | 39.1 | 41.6 | 43.5 | 47.2 | 49.9 | 56.7 |
| | 0.5 | 0.9 | 1.3 | 1.6 | 1.8 | 2.0 | 2.2 | 2.5 | 2.8 | 3.4 | 3.8 | 5.1 |
| 3 h | 20.5 | 28.3 | 34.0 | 37.4 | 40.0 | 42.0 | 43.7 | 46.4 | 48.6 | 52.6 | 55.6 | 63.3 |
| | 0.7 | 1.0 | 1.4 | 1.6 | 1.9 | 2.1 | 2.3 | 2.6 | 2.8 | 3.4 | 3.8 | 5.0 |
| 6 h | 24.8 | 33.0 | 39.0 | 42.7 | 45.3 | 47.5 | 49.2 | 52.1 | 54.4 | 58.6 | 61.8 | 69.8 |
| | 0.8 | 1.1 | 1.5 | 1.9 | 2.2 | 2.4 | 2.7 | 3.1 | 3.4 | 4.2 | 4.8 | 6.5 |
| 12 h | 30.0 | 39.8 | 47.1 | 51.5 | 54.7 | 57.2 | 59.4 | 62.8 | 65.5 | 70.6 | 74.4 | 83.9 |
| | 1.1 | 1.5 | 2.0 | 2.4 | 2.8 | 3.1 | 3.4 | 4.0 | 4.4 | 5.4 | 6.1 | 8.3 |
| 1 j | 35.9 | 47.2 | 55.3 | 60.1 | 63.6 | 66.3 | 68.6 | 72.3 | 75.2 | 80.5 | 84.5 | 94.4 |
| | 1.2 | 1.5 | 1.9 | 2.2 | 2.4 | 2.6 | 2.8 | 3.1 | 3.4 | 3.9 | 4.3 | 5.5 |
| 2 j | 44.6 | 57.7 | 66.9 | 72.3 | 76.1 | 79.2 | 81.6 | 85.6 | 88.7 | 94.5 | 98.7 | 109.1 |
| | 1.7 | 2.4 | 3.2 | 3.7 | 4.2 | 4.5 | 4.9 | 5.4 | 5.9 | 6.8 | 7.5 | 9.4 |
| 3 j | 46.8 | 60.5 | 70.0 | 75.5 | 79.4 | 82.4 | 85.0 | 89.0 | 92.1 | 97.8 | 102.0 | 112.2 |
| | 2.1 | 2.9 | 3.6 | 4.2 | 4.7 | 5.0 | 5.3 | 5.9 | 6.3 | 7.2 | 7.9 | 9.7 |
| 4 j | 50.5 | 65.0 | 74.9 | 80.7 | 84.7 | 87.9 | 90.5 | 94.6 | 97.8 | 103.7 | 107.9 | 118.3 |
| | 2.4 | 3.0 | 3.7 | 4.1 | 4.5 | 4.8 | 5.1 | 5.5 | 5.9 | 6.6 | 7.1 | 8.6 |
| 5 j | 57.2 | 72.6 | 83.2 | 89.2 | 93.5 | 96.8 | 99.5 | 103.8 | 107.1 | 113.2 | 117.6 | 128.2 |
| | 2.7 | 3.4 | 4.0 | 4.4 | 4.7 | 5.0 | 5.3 | 5.6 | 6.0 | 6.6 | 7.1 | 8.5 |
| 7 j | 65.3 | 82.1 | 93.3 | 99.7 | 104.3 | 107.8 | 110.6 | 115.1 | 118.6 | 125.0 | 129.5 | 140.5 |
| | 3.2 | 3.9 | 4.5 | 4.9 | 5.2 | 5.5 | 5.7 | 6.1 | 6.4 | 7.0 | 7.4 | 8.7 |
| 10 j | 77.2 | 95.3 | 107.3 | 114.1 | 118.9 | 122.6 | 125.6 | 130.3 | 133.9 | 140.6 | 145.2 | 156.5 |
| | 3.9 | 4.9 | 5.7 | 6.2 | 6.5 | 6.8 | 7.0 | 7.4 | 7.8 | 8.4 | 8.9 | 10.2 |
| 15 j | 93.3 | 114.5 | 128.4 | 136.2 | 141.7 | 145.9 | 149.2 | 154.6 | 158.7 | 166.0 | 171.2 | 183.7 |
| | 4.9 | 5.9 | 6.7 | 7.1 | 7.4 | 7.6 | 7.8 | 8.1 | 8.3 | 8.8 | 9.1 | 10.0 |
| 20 j | 108.6 | 133.2 | 149.1 | 158.0 | 164.2 | 168.9 | 172.7 | 178.7 | 183.3 | 191.6 | 197.4 | 211.2 |
| | 5.7 | 7.1 | 8.0 | 8.6 | 9.0 | 9.3 | 9.5 | 9.9 | 10.2 | 10.8 | 11.3 | 12.4 |
| 25 j | 114.8 | 141.1 | 158.0 | 167.3 | 173.8 | 178.7 | 182.7 | 189.0 | 193.8 | 202.3 | 208.3 | 222.6 |
| | 6.4 | 7.9 | 9.1 | 9.8 | 10.3 | 10.8 | 11.1 | 11.7 | 12.2 | 13.1 | 13.8 | 15.6 |
| 30 j | 135.4 | 163.9 | 182.2 | 192.3 | 199.2 | 204.5 | 208.8 | 215.5 | 220.6 | 229.7 | 236.1 | 251.2 |
| | 7.1 | 8.8 | 10.2 | 11.1 | 11.8 | 12.3 | 12.8 | 13.6 | 14.2 | 15.5 | 16.4 | 18.8 |

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 | 7.1 | 10.0 | 12.1 | 13.3 | 14.1 | 14.8 | 15.3 | 16.2 | 16.8 | 18.0 | 18.8 | 20.8 |
| | 7.8 | 11.4 | 14.2 | 15.9 | 17.3 | 18.4 | 19.3 | 20.8 | 22.1 | 24.5 | 26.3 | 31.1 |
| 20 min | 10.0 | 14.1 | 17.1 | 18.8 | 20.1 | 21.0 | 21.8 | 23.0 | 24.0 | 25.7 | 27.0 | 29.9 |
| | 11.2 | 16.2 | 20.0 | 22.4 | 24.3 | 25.8 | 27.0 | 29.1 | 30.8 | 34.0 | 36.5 | 43.0 |
| 30 min | 11.8 | 17.0 | 20.7 | 22.9 | 24.5 | 25.7 | 26.7 | 28.3 | 29.6 | 32.0 | 33.7 | 37.9 |
| | 13.3 | 19.5 | 24.3 | 27.3 | 29.5 | 31.3 | 32.8 | 35.3 | 37.3 | 41.1 | 44.0 | 51.5 |
| 1 h | 14.7 | 20.2 | 24.0 | 26.2 | 27.8 | 29.0 | 30.0 | 31.6 | 32.9 | 35.1 | 36.8 | 40.6 |
| | 16.4 | 23.1 | 28.3 | 31.6 | 34.1 | 36.0 | 37.7 | 40.5 | 42.7 | 47.0 | 50.2 | 58.7 |
| 2 h | 17.5 | 23.6 | 28.0 | 30.5 | 32.3 | 33.7 | 34.8 | 36.6 | 38.0 | 40.5 | 42.3 | 46.7 |
| | 19.6 | 27.2 | 33.0 | 36.7 | 39.4 | 41.6 | 43.5 | 46.5 | 49.0 | 53.8 | 57.4 | 66.8 |
| 3 h | 19.3 | 26.3 | 31.3 | 34.2 | 36.3 | 37.9 | 39.2 | 41.4 | 43.0 | 46.0 | 48.2 | 53.5 |
| | 21.8 | 30.2 | 36.7 | 40.7 | 43.7 | 46.1 | 48.1 | 51.4 | 54.1 | 59.2 | 63.1 | 73.1 |
| 6 h | 23.2 | 30.8 | 36.0 | 39.0 | 41.1 | 42.7 | 44.0 | 46.1 | 47.6 | 50.5 | 52.4 | 57.1 |
| | 26.3 | 35.1 | 42.0 | 46.3 | 49.6 | 52.2 | 54.4 | 58.1 | 61.1 | 66.8 | 71.1 | 82.5 |
| 12 h | 27.9 | 36.9 | 43.2 | 46.7 | 49.2 | 51.1 | 52.6 | 55.0 | 56.8 | 60.1 | 62.4 | 67.7 |
| | 32.1 | 42.8 | 51.0 | 56.3 | 60.2 | 63.4 | 66.1 | 70.5 | 74.1 | 81.1 | 86.4 | 100.2 |
| 1 j | 33.6 | 44.2 | 51.6 | 55.8 | 58.9 | 61.2 | 63.1 | 66.2 | 68.6 | 72.9 | 76.0 | 83.7 |
| | 38.1 | 50.1 | 59.0 | 64.4 | 68.3 | 71.5 | 74.1 | 78.3 | 81.8 | 88.2 | 92.9 | 105.1 |
| 2 j | 41.2 | 52.9 | 60.6 | 65.0 | 67.9 | 70.2 | 72.1 | 75.0 | 77.2 | 81.2 | 84.0 | 90.6 |
| | 47.9 | 62.4 | 73.1 | 79.6 | 84.3 | 88.1 | 91.2 | 96.2 | 100.3 | 107.8 | 113.4 | 127.5 |
| 3 j | 42.7 | 54.9 | 62.8 | 67.2 | 70.3 | 72.6 | 74.5 | 77.4 | 79.7 | 83.7 | 86.6 | 93.2 |
| | 50.8 | 66.1 | 77.1 | 83.7 | 88.5 | 92.3 | 95.4 | 100.5 | 104.5 | 111.9 | 117.4 | 131.1 |
| 4 j | 45.8 | 59.0 | 67.7 | 72.5 | 75.9 | 78.5 | 80.6 | 83.8 | 86.3 | 90.8 | 94.0 | 101.4 |
| | 55.1 | 70.9 | 82.2 | 88.8 | 93.6 | 97.3 | 100.4 | 105.4 | 109.3 | 116.6 | 121.9 | 135.1 |
| 5 j | 51.9 | 66.0 | 75.3 | 80.5 | 84.1 | 86.9 | 89.2 | 92.7 | 95.4 | 100.3 | 103.6 | 111.7 |
| | 62.5 | 79.3 | 91.0 | 97.9 | 102.8 | 106.6 | 109.8 | 114.8 | 118.8 | 126.2 | 131.5 | 144.8 |
| 7 j | 59.1 | 74.4 | 84.4 | 90.1 | 94.0 | 97.0 | 99.4 | 103.2 | 106.1 | 111.3 | 114.9 | 123.5 |
| | 71.6 | 89.8 | 102.2 | 109.4 | 114.5 | 118.5 | 121.8 | 127.1 | 131.1 | 138.7 | 144.1 | 157.4 |
| 10 j | 69.4 | 85.6 | 96.2 | 102.1 | 106.1 | 109.3 | 111.8 | 115.7 | 118.7 | 124.1 | 127.8 | 136.6 |
| | 84.9 | 105.0 | 118.5 | 126.2 | 131.7 | 135.9 | 139.4 | 144.9 | 149.2 | 157.0 | 162.7 | 176.4 |
| 15 j | 83.8 | 102.9 | 115.4 | 122.4 | 127.2 | 130.9 | 134.0 | 138.7 | 142.3 | 148.8 | 153.3 | 164.1 |
| | 102.8 | 126.2 | 141.5 | 150.1 | 156.1 | 160.8 | 164.5 | 170.4 | 175.0 | 183.3 | 189.2 | 203.3 |
| 20 j | 97.3 | 119.3 | 133.4 | 141.2 | 146.7 | 150.8 | 154.1 | 159.3 | 163.3 | 170.3 | 175.3 | 186.8 |
| | 119.8 | 147.1 | 164.9 | 174.8 | 181.7 | 187.1 | 191.4 | 198.1 | 203.4 | 212.8 | 219.5 | 235.6 |
| 25 j | 102.3 | 125.5 | 140.1 | 148.1 | 153.5 | 157.6 | 160.9 | 166.0 | 169.8 | 176.6 | 181.3 | 192.0 |
| | 127.3 | 156.6 | 175.8 | 186.5 | 194.0 | 199.8 | 204.5 | 211.9 | 217.7 | 228.1 | 235.4 | 253.2 |
| 30 j | 121.4 | 146.7 | 162.2 | 170.6 | 176.2 | 180.4 | 183.7 | 188.8 | 192.7 | 199.4 | 204.0 | 214.3 |
| | 149.3 | 181.2 | 202.1 | 214.0 | 222.3 | 228.7 | 233.9 | 242.1 | 248.5 | 260.1 | 268.3 | 288.1 |

4. Estimation des coefficients de Montana.

Formule de Montana : intensité[mm/h] = $a \cdot \text{durée}[\text{min}]^{-b}$ 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 | 128.4 | 0.4604 | 310.5 | 0.7346 | 55.7 | 0.5371 |
| 5 | 186.4 | 0.4652 | 474.4 | 0.7555 | 88.4 | 0.5623 |
| 10 | 228.5 | 0.4648 | 605.4 | 0.7675 | 117.9 | 0.5795 |
| 15 | 253.7 | 0.4638 | 688.4 | 0.7739 | 138.1 | 0.5892 |
| 20 | 271.9 | 0.4627 | 750.9 | 0.7783 | 154.0 | 0.5961 |
| 25 | 286.3 | 0.4618 | 801.5 | 0.7816 | 167.2 | 0.6014 |
| 30 | 298.3 | 0.4610 | 844.5 | 0.7842 | 178.8 | 0.6058 |
| 40 | 317.5 | 0.4595 | 915.2 | 0.7884 | 198.3 | 0.6126 |
| 50 | 332.8 | 0.4583 | 972.8 | 0.7915 | 214.7 | 0.6178 |
| 75 | 361.3 | 0.4559 | 1083.9 | 0.7972 | 247.6 | 0.6274 |
| 100 | 382.1 | 0.4540 | 1168.0 | 0.8011 | 273.5 | 0.6342 |
| 200 | 434.7 | 0.4492 | 1391.1 | 0.8105 | 346.1 | 0.6507 |

Références

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