



Statistiques des précipitations extrêmes des communes belges

Grobbendonk (INS 13010)

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 | 7.6 | 11.0 | 13.4 | 15.0 | 16.1 | 17.0 | 17.7 | 18.9 | 19.9 | 21.7 | 23.1 | 26.6 |
| 20 min | 11.0 | 15.8 | 19.4 | 21.6 | 23.2 | 24.5 | 25.6 | 27.3 | 28.7 | 31.4 | 33.3 | 38.3 |
| 30 min | 13.0 | 18.9 | 23.3 | 26.0 | 28.0 | 29.5 | 30.8 | 33.0 | 34.7 | 37.9 | 40.2 | 46.3 |
| 1 h | 16.2 | 22.6 | 27.5 | 30.4 | 32.6 | 34.3 | 35.7 | 38.0 | 39.9 | 43.4 | 45.9 | 52.5 |
| 2 h | 19.4 | 26.7 | 32.1 | 35.4 | 37.8 | 39.8 | 41.4 | 44.0 | 46.0 | 49.9 | 52.8 | 60.2 |
| 3 h | 21.5 | 29.5 | 35.5 | 39.1 | 41.8 | 43.9 | 45.6 | 48.5 | 50.8 | 55.0 | 58.2 | 66.2 |
| 6 h | 25.9 | 34.2 | 40.4 | 44.1 | 46.8 | 48.9 | 50.7 | 53.6 | 55.9 | 60.3 | 63.5 | 71.6 |
| 12 h | 31.6 | 41.6 | 48.9 | 53.3 | 56.5 | 59.1 | 61.2 | 64.7 | 67.4 | 72.6 | 76.3 | 86.0 |
| 1 j | 38.7 | 50.1 | 58.4 | 63.2 | 66.8 | 69.6 | 71.9 | 75.6 | 78.5 | 84.0 | 88.0 | 98.0 |
| 2 j | 49.1 | 62.8 | 72.4 | 78.0 | 82.1 | 85.2 | 87.8 | 92.0 | 95.3 | 101.3 | 105.7 | 116.5 |
| 3 j | 52.2 | 66.8 | 76.9 | 82.8 | 87.0 | 90.2 | 92.9 | 97.2 | 100.5 | 106.6 | 111.0 | 121.9 |
| 4 j | 56.8 | 72.3 | 83.0 | 89.1 | 93.5 | 96.9 | 99.7 | 104.1 | 107.5 | 113.9 | 118.4 | 129.5 |
| 5 j | 64.4 | 81.3 | 92.7 | 99.3 | 103.9 | 107.5 | 110.5 | 115.2 | 118.8 | 125.5 | 130.2 | 141.8 |
| 7 j | 74.2 | 92.5 | 104.7 | 111.7 | 116.6 | 120.5 | 123.6 | 128.5 | 132.3 | 139.2 | 144.1 | 156.1 |
| 10 j | 88.3 | 108.9 | 122.6 | 130.3 | 135.7 | 139.9 | 143.3 | 148.7 | 152.8 | 160.3 | 165.6 | 178.4 |
| 15 j | 107.0 | 131.0 | 146.8 | 155.6 | 161.7 | 166.4 | 170.2 | 176.2 | 180.8 | 189.2 | 195.1 | 209.1 |
| 20 j | 124.7 | 152.7 | 170.8 | 180.9 | 187.9 | 193.3 | 197.6 | 204.4 | 209.7 | 219.1 | 225.7 | 241.4 |
| 25 j | 132.9 | 162.7 | 181.8 | 192.4 | 199.8 | 205.4 | 209.9 | 217.0 | 222.4 | 232.2 | 239.0 | 255.1 |
| 30 j | 155.4 | 187.3 | 207.7 | 219.0 | 226.8 | 232.7 | 237.5 | 244.9 | 250.6 | 260.9 | 268.0 | 284.9 |

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 | 7.6 | 11.0 | 13.4 | 15.0 | 16.1 | 17.0 | 17.7 | 18.9 | 19.9 | 21.7 | 23.1 | 26.6 |
| | 0.2 | 0.3 | 0.5 | 0.7 | 0.8 | 0.9 | 1.0 | 1.2 | 1.4 | 1.7 | 1.9 | 2.7 |
| 20 min | 11.0 | 15.8 | 19.4 | 21.6 | 23.2 | 24.5 | 25.6 | 27.3 | 28.7 | 31.4 | 33.3 | 38.3 |
| | 0.3 | 0.5 | 0.8 | 1.0 | 1.2 | 1.3 | 1.4 | 1.7 | 1.9 | 2.3 | 2.7 | 3.6 |
| 30 min | 13.0 | 18.9 | 23.3 | 26.0 | 28.0 | 29.5 | 30.8 | 33.0 | 34.7 | 37.9 | 40.2 | 46.3 |
| | 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 | 16.2 | 22.6 | 27.5 | 30.4 | 32.6 | 34.3 | 35.7 | 38.0 | 39.9 | 43.4 | 45.9 | 52.5 |
| | 0.5 | 0.7 | 1.0 | 1.3 | 1.5 | 1.7 | 1.9 | 2.2 | 2.4 | 2.9 | 3.4 | 4.6 |
| 2 h | 19.4 | 26.7 | 32.1 | 35.4 | 37.8 | 39.8 | 41.4 | 44.0 | 46.0 | 49.9 | 52.8 | 60.2 |
| | 0.5 | 0.9 | 1.2 | 1.5 | 1.7 | 1.9 | 2.1 | 2.5 | 2.7 | 3.3 | 3.8 | 5.1 |
| 3 h | 21.5 | 29.5 | 35.5 | 39.1 | 41.8 | 43.9 | 45.6 | 48.5 | 50.8 | 55.0 | 58.2 | 66.2 |
| | 0.6 | 0.9 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | 2.4 | 2.7 | 3.2 | 3.6 | 4.8 |
| 6 h | 25.9 | 34.2 | 40.4 | 44.1 | 46.8 | 48.9 | 50.7 | 53.6 | 55.9 | 60.3 | 63.5 | 71.6 |
| | 0.8 | 1.0 | 1.4 | 1.7 | 2.0 | 2.2 | 2.5 | 2.9 | 3.2 | 4.0 | 4.6 | 6.3 |
| 12 h | 31.6 | 41.6 | 48.9 | 53.3 | 56.5 | 59.1 | 61.2 | 64.7 | 67.4 | 72.6 | 76.3 | 86.0 |
| | 1.0 | 1.4 | 1.9 | 2.3 | 2.7 | 3.0 | 3.3 | 3.8 | 4.3 | 5.3 | 6.0 | 8.2 |
| 1 j | 38.7 | 50.1 | 58.4 | 63.2 | 66.8 | 69.6 | 71.9 | 75.6 | 78.5 | 84.0 | 88.0 | 98.0 |
| | 1.1 | 1.4 | 1.7 | 1.9 | 2.1 | 2.3 | 2.5 | 2.7 | 3.0 | 3.5 | 3.9 | 5.0 |
| 2 j | 49.1 | 62.8 | 72.4 | 78.0 | 82.1 | 85.2 | 87.8 | 92.0 | 95.3 | 101.3 | 105.7 | 116.5 |
| | 1.7 | 2.2 | 2.8 | 3.3 | 3.7 | 4.1 | 4.3 | 4.9 | 5.3 | 6.1 | 6.8 | 8.7 |
| 3 j | 52.2 | 66.8 | 76.9 | 82.8 | 87.0 | 90.2 | 92.9 | 97.2 | 100.5 | 106.6 | 111.0 | 121.9 |
| | 2.0 | 2.7 | 3.4 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 | 5.8 | 6.7 | 7.3 | 9.1 |
| 4 j | 56.8 | 72.3 | 83.0 | 89.1 | 93.5 | 96.9 | 99.7 | 104.1 | 107.5 | 113.9 | 118.4 | 129.5 |
| | 2.3 | 2.9 | 3.5 | 3.9 | 4.2 | 4.5 | 4.7 | 5.1 | 5.5 | 6.2 | 6.7 | 8.1 |
| 5 j | 64.4 | 81.3 | 92.7 | 99.3 | 103.9 | 107.5 | 110.5 | 115.2 | 118.8 | 125.5 | 130.2 | 141.8 |
| | 2.7 | 3.3 | 3.9 | 4.3 | 4.6 | 4.8 | 5.1 | 5.4 | 5.8 | 6.4 | 6.9 | 8.2 |
| 7 j | 74.2 | 92.5 | 104.7 | 111.7 | 116.6 | 120.5 | 123.6 | 128.5 | 132.3 | 139.2 | 144.1 | 156.1 |
| | 3.2 | 3.8 | 4.4 | 4.7 | 5.0 | 5.2 | 5.4 | 5.7 | 6.0 | 6.5 | 6.9 | 8.1 |
| 10 j | 88.3 | 108.9 | 122.6 | 130.3 | 135.7 | 139.9 | 143.3 | 148.7 | 152.8 | 160.3 | 165.6 | 178.4 |
| | 4.0 | 5.0 | 5.6 | 6.1 | 6.4 | 6.7 | 6.9 | 7.3 | 7.6 | 8.2 | 8.7 | 9.9 |
| 15 j | 107.0 | 131.0 | 146.8 | 155.6 | 161.7 | 166.4 | 170.2 | 176.2 | 180.8 | 189.2 | 195.1 | 209.1 |
| | 4.9 | 6.0 | 6.7 | 7.1 | 7.4 | 7.6 | 7.8 | 8.1 | 8.3 | 8.7 | 9.0 | 9.9 |
| 20 j | 124.7 | 152.7 | 170.8 | 180.9 | 187.9 | 193.3 | 197.6 | 204.4 | 209.7 | 219.1 | 225.7 | 241.4 |
| | 5.8 | 7.1 | 8.0 | 8.5 | 8.9 | 9.1 | 9.4 | 9.7 | 10.0 | 10.6 | 11.0 | 12.1 |
| 25 j | 132.9 | 162.7 | 181.8 | 192.4 | 199.8 | 205.4 | 209.9 | 217.0 | 222.4 | 232.2 | 239.0 | 255.1 |
| | 6.5 | 8.0 | 9.2 | 9.9 | 10.4 | 10.8 | 11.2 | 11.8 | 12.2 | 13.2 | 13.9 | 15.7 |
| 30 j | 155.4 | 187.3 | 207.7 | 219.0 | 226.8 | 232.7 | 237.5 | 244.9 | 250.6 | 260.9 | 268.0 | 284.9 |
| | 7.2 | 8.8 | 10.2 | 11.0 | 11.7 | 12.2 | 12.7 | 13.5 | 14.1 | 15.4 | 16.3 | 18.7 |

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 | 7.2 | 10.3 | 12.4 | 13.6 | 14.5 | 15.2 | 15.7 | 16.6 | 17.2 | 18.4 | 19.3 | 21.3 |
| | 8.0 | 11.6 | 14.5 | 16.3 | 17.7 | 18.8 | 19.7 | 21.3 | 22.6 | 25.0 | 26.9 | 31.8 |
| 20 min | 10.4 | 14.8 | 17.9 | 19.7 | 21.0 | 22.0 | 22.8 | 24.0 | 25.0 | 26.8 | 28.1 | 31.2 |
| | 11.7 | 16.9 | 20.9 | 23.5 | 25.5 | 27.1 | 28.4 | 30.6 | 32.4 | 35.9 | 38.5 | 45.4 |
| 30 min | 12.2 | 17.7 | 21.7 | 24.0 | 25.7 | 27.0 | 28.1 | 29.8 | 31.2 | 33.7 | 35.5 | 40.0 |
| | 13.8 | 20.1 | 24.9 | 28.0 | 30.2 | 32.1 | 33.6 | 36.1 | 38.2 | 42.1 | 45.0 | 52.6 |
| 1 h | 15.3 | 21.2 | 25.4 | 27.9 | 29.6 | 30.9 | 32.0 | 33.8 | 35.1 | 37.6 | 39.3 | 43.6 |
| | 17.0 | 24.1 | 29.5 | 33.0 | 35.5 | 37.6 | 39.4 | 42.3 | 44.6 | 49.1 | 52.5 | 61.5 |
| 2 h | 18.3 | 25.0 | 29.8 | 32.5 | 34.4 | 36.0 | 37.2 | 39.1 | 40.6 | 43.4 | 45.4 | 50.1 |
| | 20.4 | 28.4 | 34.5 | 38.4 | 41.2 | 43.6 | 45.5 | 48.8 | 51.4 | 56.5 | 60.3 | 70.2 |
| 3 h | 20.2 | 27.7 | 33.0 | 36.2 | 38.4 | 40.1 | 41.5 | 43.8 | 45.5 | 48.8 | 51.1 | 56.8 |
| | 22.7 | 31.4 | 38.0 | 42.1 | 45.2 | 47.7 | 49.8 | 53.2 | 56.0 | 61.2 | 65.2 | 75.6 |
| 6 h | 24.5 | 32.3 | 37.7 | 40.8 | 42.9 | 44.6 | 45.9 | 48.0 | 49.6 | 52.5 | 54.6 | 59.4 |
| | 27.4 | 36.2 | 43.0 | 47.4 | 50.6 | 53.3 | 55.5 | 59.2 | 62.2 | 68.0 | 72.4 | 83.9 |
| 12 h | 29.6 | 38.9 | 45.3 | 48.8 | 51.3 | 53.2 | 54.8 | 57.2 | 59.0 | 62.3 | 64.5 | 69.8 |
| | 33.6 | 44.2 | 52.5 | 57.8 | 61.7 | 65.0 | 67.7 | 72.2 | 75.8 | 82.9 | 88.2 | 102.1 |
| 1 j | 36.5 | 47.5 | 55.1 | 59.5 | 62.6 | 65.1 | 67.0 | 70.2 | 72.7 | 77.2 | 80.4 | 88.2 |
| | 40.8 | 52.8 | 61.6 | 67.0 | 70.9 | 74.1 | 76.7 | 81.0 | 84.4 | 90.8 | 95.6 | 107.8 |
| 2 j | 45.8 | 58.5 | 66.9 | 71.5 | 74.8 | 77.3 | 79.3 | 82.5 | 84.9 | 89.3 | 92.3 | 99.5 |
| | 52.3 | 67.1 | 78.0 | 84.5 | 89.4 | 93.2 | 96.4 | 101.5 | 105.6 | 113.4 | 119.0 | 133.5 |
| 3 j | 48.3 | 61.6 | 70.3 | 75.2 | 78.6 | 81.2 | 83.3 | 86.6 | 89.1 | 93.5 | 96.7 | 104.1 |
| | 56.2 | 72.1 | 83.5 | 90.4 | 95.3 | 99.2 | 102.5 | 107.7 | 111.9 | 119.7 | 125.3 | 139.6 |
| 4 j | 52.2 | 66.6 | 76.2 | 81.5 | 85.2 | 88.1 | 90.4 | 94.0 | 96.8 | 101.8 | 105.3 | 113.5 |
| | 61.3 | 78.1 | 89.8 | 96.8 | 101.8 | 105.7 | 109.0 | 114.2 | 118.3 | 125.9 | 131.5 | 145.4 |
| 5 j | 59.2 | 74.7 | 85.1 | 90.9 | 94.9 | 98.1 | 100.6 | 104.5 | 107.5 | 112.9 | 116.7 | 125.7 |
| | 69.7 | 87.8 | 100.3 | 107.7 | 112.9 | 117.0 | 120.4 | 125.8 | 130.1 | 138.0 | 143.7 | 157.9 |
| 7 j | 67.9 | 84.9 | 96.2 | 102.5 | 106.9 | 110.3 | 113.0 | 117.3 | 120.5 | 126.4 | 130.5 | 140.3 |
| | 80.5 | 100.0 | 113.3 | 121.0 | 126.4 | 130.6 | 134.1 | 139.7 | 144.0 | 152.0 | 157.8 | 172.0 |
| 10 j | 80.5 | 99.2 | 111.5 | 118.4 | 123.2 | 126.8 | 129.8 | 134.4 | 137.9 | 144.2 | 148.6 | 158.9 |
| | 96.2 | 118.6 | 133.7 | 142.3 | 148.3 | 153.0 | 156.9 | 162.9 | 167.7 | 176.4 | 182.6 | 197.9 |
| 15 j | 97.4 | 119.3 | 133.6 | 141.7 | 147.3 | 151.5 | 155.0 | 160.4 | 164.6 | 172.1 | 177.3 | 189.8 |
| | 116.7 | 142.8 | 159.9 | 169.4 | 176.1 | 181.3 | 185.4 | 192.0 | 197.1 | 206.3 | 212.8 | 228.5 |
| 20 j | 113.3 | 138.7 | 155.1 | 164.2 | 170.6 | 175.4 | 179.3 | 185.4 | 190.0 | 198.3 | 204.1 | 217.6 |
| | 136.1 | 166.7 | 186.5 | 197.6 | 205.3 | 211.2 | 216.0 | 223.5 | 229.3 | 239.9 | 247.3 | 265.1 |
| 25 j | 120.2 | 147.0 | 163.9 | 173.1 | 179.5 | 184.2 | 188.1 | 194.0 | 198.5 | 206.4 | 211.8 | 224.3 |
| | 145.6 | 178.4 | 199.8 | 211.8 | 220.1 | 226.6 | 231.8 | 240.1 | 246.4 | 258.0 | 266.2 | 286.0 |
| 30 j | 141.3 | 170.0 | 187.8 | 197.4 | 203.8 | 208.7 | 212.6 | 218.5 | 223.0 | 230.8 | 236.1 | 248.1 |
| | 169.4 | 204.6 | 227.6 | 240.6 | 249.7 | 256.7 | 262.4 | 271.4 | 278.3 | 291.0 | 299.9 | 321.6 |

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 | 135.3 | 0.4702 | 300.7 | 0.7184 | 52.4 | 0.5175 |
| 5 | 193.6 | 0.4693 | 466.1 | 0.7423 | 78.3 | 0.5373 |
| 10 | 235.9 | 0.4662 | 598.8 | 0.7557 | 101.6 | 0.5518 |
| 15 | 261.1 | 0.4640 | 683.1 | 0.7628 | 117.5 | 0.5604 |
| 20 | 279.4 | 0.4622 | 746.5 | 0.7675 | 129.9 | 0.5665 |
| 25 | 293.8 | 0.4608 | 797.9 | 0.7711 | 140.2 | 0.5713 |
| 30 | 305.8 | 0.4595 | 841.6 | 0.7740 | 149.2 | 0.5752 |
| 40 | 325.1 | 0.4575 | 913.5 | 0.7785 | 164.5 | 0.5814 |
| 50 | 340.4 | 0.4559 | 972.0 | 0.7819 | 177.2 | 0.5862 |
| 75 | 368.9 | 0.4528 | 1085.0 | 0.7879 | 202.7 | 0.5951 |
| 100 | 389.7 | 0.4505 | 1170.6 | 0.7921 | 222.7 | 0.6014 |
| 200 | 442.3 | 0.4447 | 1397.8 | 0.8021 | 278.8 | 0.6168 |

Références

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