



Statistiek van de extreme neerslag voor de Belgische gemeenten

Tournai (NIS 57081)

1. Geschatte neerslaghoeveelheid voor een neerslagduur van 10 minuten tot 30 dagen (rijen) en een terugkeerperiode van 2 tot 200 jaar (kolommen). Eenheid: mm.

| Duur | Terugkeerperiode (jaren) | | | | | | | | | | | |
|--------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2 | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 200 |
| 10 min | 7.6 | 10.9 | 13.3 | 14.8 | 15.9 | 16.8 | 17.6 | 18.8 | 19.7 | 21.5 | 22.9 | 26.4 |
| 20 min | 10.9 | 15.6 | 19.1 | 21.3 | 22.8 | 24.1 | 25.2 | 26.9 | 28.2 | 30.8 | 32.7 | 37.6 |
| 30 min | 12.8 | 18.7 | 23.0 | 25.7 | 27.6 | 29.2 | 30.5 | 32.6 | 34.2 | 37.4 | 39.7 | 45.8 |
| 1 u | 15.9 | 22.3 | 27.0 | 29.9 | 32.0 | 33.6 | 35.0 | 37.3 | 39.1 | 42.5 | 45.0 | 51.5 |
| 2 u | 19.1 | 26.2 | 31.5 | 34.8 | 37.1 | 39.0 | 40.6 | 43.1 | 45.1 | 48.9 | 51.8 | 58.9 |
| 3 u | 21.1 | 29.1 | 35.0 | 38.5 | 41.1 | 43.2 | 44.9 | 47.7 | 50.0 | 54.2 | 57.3 | 65.2 |
| 6 u | 25.5 | 33.8 | 39.9 | 43.6 | 46.3 | 48.4 | 50.2 | 53.1 | 55.4 | 59.7 | 62.9 | 71.0 |
| 12 u | 31.0 | 40.9 | 48.3 | 52.7 | 55.9 | 58.4 | 60.6 | 64.0 | 66.7 | 71.9 | 75.6 | 85.3 |
| 1 d | 37.9 | 49.3 | 57.5 | 62.4 | 65.9 | 68.7 | 71.0 | 74.7 | 77.6 | 83.1 | 87.0 | 97.0 |
| 2 d | 47.9 | 61.4 | 70.9 | 76.5 | 80.5 | 83.6 | 86.2 | 90.3 | 93.5 | 99.5 | 103.8 | 114.5 |
| 3 d | 50.8 | 65.1 | 75.1 | 80.8 | 84.9 | 88.2 | 90.8 | 95.0 | 98.3 | 104.3 | 108.6 | 119.3 |
| 4 d | 55.1 | 70.4 | 80.8 | 86.9 | 91.2 | 94.5 | 97.2 | 101.6 | 105.0 | 111.2 | 115.6 | 126.5 |
| 5 d | 62.5 | 79.0 | 90.2 | 96.6 | 101.1 | 104.7 | 107.6 | 112.1 | 115.7 | 122.2 | 126.9 | 138.2 |
| 7 d | 71.9 | 89.7 | 101.7 | 108.5 | 113.4 | 117.1 | 120.1 | 124.9 | 128.6 | 135.4 | 140.3 | 152.0 |
| 10 d | 85.4 | 105.3 | 118.5 | 126.0 | 131.3 | 135.3 | 138.6 | 143.8 | 147.8 | 155.1 | 160.2 | 172.6 |
| 15 d | 103.4 | 126.6 | 141.9 | 150.4 | 156.4 | 160.9 | 164.7 | 170.5 | 174.9 | 183.0 | 188.7 | 202.4 |
| 20 d | 120.4 | 147.5 | 165.1 | 174.8 | 181.6 | 186.8 | 191.0 | 197.6 | 202.7 | 211.8 | 218.2 | 233.3 |
| 25 d | 128.1 | 157.0 | 175.5 | 185.8 | 192.9 | 198.3 | 202.7 | 209.6 | 214.8 | 224.3 | 230.9 | 246.5 |
| 30 d | 150.1 | 181.1 | 200.9 | 211.9 | 219.4 | 225.2 | 229.9 | 237.1 | 242.7 | 252.6 | 259.5 | 275.9 |

2. Geschatte neerslaghoeveelheid en standaardafwijking van deze schatting voor een neerslagduur van 10 minuten tot 30 dagen (rijen) en een terugkeerperiode van 2 tot 200 jaar (kolommen). Eenheid: mm.

| Duur | Terugkeerperiode (jaren) | | | | | | | | | | | |
|--------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2 | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 200 |
| 10 min | 7.6 | 10.9 | 13.3 | 14.8 | 15.9 | 16.8 | 17.6 | 18.8 | 19.7 | 21.5 | 22.9 | 26.4 |
| | 0.2 | 0.4 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.2 | 1.4 | 1.7 | 1.9 | 2.7 |
| 20 min | 10.9 | 15.6 | 19.1 | 21.3 | 22.8 | 24.1 | 25.2 | 26.9 | 28.2 | 30.8 | 32.7 | 37.6 |
| | 0.4 | 0.6 | 0.9 | 1.1 | 1.3 | 1.4 | 1.6 | 1.8 | 2.0 | 2.4 | 2.7 | 3.7 |
| 30 min | 12.8 | 18.7 | 23.0 | 25.7 | 27.6 | 29.2 | 30.5 | 32.6 | 34.2 | 37.4 | 39.7 | 45.8 |
| | 0.5 | 0.7 | 1.0 | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 2.0 | 2.3 | 2.6 | 3.4 |
| 1 u | 15.9 | 22.3 | 27.0 | 29.9 | 32.0 | 33.6 | 35.0 | 37.3 | 39.1 | 42.5 | 45.0 | 51.5 |
| | 0.6 | 0.9 | 1.3 | 1.6 | 1.8 | 2.0 | 2.2 | 2.5 | 2.7 | 3.2 | 3.7 | 4.8 |
| 2 u | 19.1 | 26.2 | 31.5 | 34.8 | 37.1 | 39.0 | 40.6 | 43.1 | 45.1 | 48.9 | 51.8 | 58.9 |
| | 0.7 | 1.1 | 1.5 | 1.8 | 2.1 | 2.3 | 2.5 | 2.8 | 3.1 | 3.7 | 4.2 | 5.5 |
| 3 u | 21.1 | 29.1 | 35.0 | 38.5 | 41.1 | 43.2 | 44.9 | 47.7 | 50.0 | 54.2 | 57.3 | 65.2 |
| | 0.8 | 1.2 | 1.6 | 1.8 | 2.1 | 2.3 | 2.4 | 2.7 | 3.0 | 3.5 | 3.9 | 5.1 |
| 6 u | 25.5 | 33.8 | 39.9 | 43.6 | 46.3 | 48.4 | 50.2 | 53.1 | 55.4 | 59.7 | 62.9 | 71.0 |
| | 1.0 | 1.3 | 1.6 | 1.9 | 2.2 | 2.4 | 2.7 | 3.1 | 3.4 | 4.1 | 4.7 | 6.4 |
| 12 u | 31.0 | 40.9 | 48.3 | 52.7 | 55.9 | 58.4 | 60.6 | 64.0 | 66.7 | 71.9 | 75.6 | 85.3 |
| | 1.4 | 1.7 | 2.2 | 2.5 | 2.9 | 3.2 | 3.5 | 4.0 | 4.5 | 5.4 | 6.2 | 8.3 |
| 1 d | 37.9 | 49.3 | 57.5 | 62.4 | 65.9 | 68.7 | 71.0 | 74.7 | 77.6 | 83.1 | 87.0 | 97.0 |
| | 1.7 | 2.0 | 2.2 | 2.5 | 2.7 | 2.8 | 3.0 | 3.2 | 3.5 | 3.9 | 4.3 | 5.4 |
| 2 d | 47.9 | 61.4 | 70.9 | 76.5 | 80.5 | 83.6 | 86.2 | 90.3 | 93.5 | 99.5 | 103.8 | 114.5 |
| | 2.7 | 3.3 | 3.9 | 4.4 | 4.7 | 5.0 | 5.3 | 5.8 | 6.2 | 7.1 | 7.7 | 9.5 |
| 3 d | 50.8 | 65.1 | 75.1 | 80.8 | 84.9 | 88.2 | 90.8 | 95.0 | 98.3 | 104.3 | 108.6 | 119.3 |
| | 3.3 | 4.1 | 4.8 | 5.3 | 5.7 | 6.0 | 6.3 | 6.8 | 7.2 | 8.0 | 8.6 | 10.3 |
| 4 d | 55.1 | 70.4 | 80.8 | 86.9 | 91.2 | 94.5 | 97.2 | 101.6 | 105.0 | 111.2 | 115.6 | 126.5 |
| | 3.9 | 4.6 | 5.3 | 5.7 | 6.0 | 6.3 | 6.6 | 7.0 | 7.3 | 8.0 | 8.5 | 9.9 |
| 5 d | 62.5 | 79.0 | 90.2 | 96.6 | 101.1 | 104.7 | 107.6 | 112.1 | 115.7 | 122.2 | 126.9 | 138.2 |
| | 4.4 | 5.4 | 6.1 | 6.5 | 6.9 | 7.1 | 7.4 | 7.8 | 8.1 | 8.7 | 9.2 | 10.5 |
| 7 d | 71.9 | 89.7 | 101.7 | 108.5 | 113.4 | 117.1 | 120.1 | 124.9 | 128.6 | 135.4 | 140.3 | 152.0 |
| | 5.4 | 6.4 | 7.1 | 7.5 | 7.8 | 8.1 | 8.3 | 8.7 | 9.0 | 9.6 | 10.0 | 11.2 |
| 10 d | 85.4 | 105.3 | 118.5 | 126.0 | 131.3 | 135.3 | 138.6 | 143.8 | 147.8 | 155.1 | 160.2 | 172.6 |
| | 6.7 | 8.3 | 9.3 | 9.9 | 10.4 | 10.7 | 11.0 | 11.5 | 11.9 | 12.6 | 13.2 | 14.6 |
| 15 d | 103.4 | 126.6 | 141.9 | 150.4 | 156.4 | 160.9 | 164.7 | 170.5 | 174.9 | 183.0 | 188.7 | 202.4 |
| | 8.3 | 10.0 | 11.1 | 11.7 | 12.2 | 12.5 | 12.8 | 13.2 | 13.6 | 14.2 | 14.7 | 15.8 |
| 20 d | 120.4 | 147.5 | 165.1 | 174.8 | 181.6 | 186.8 | 191.0 | 197.6 | 202.7 | 211.8 | 218.2 | 233.3 |
| | 9.7 | 11.8 | 13.2 | 14.0 | 14.5 | 14.9 | 15.3 | 15.8 | 16.3 | 17.1 | 17.6 | 19.0 |
| 25 d | 128.1 | 157.0 | 175.5 | 185.8 | 192.9 | 198.3 | 202.7 | 209.6 | 214.8 | 224.3 | 230.9 | 246.5 |
| | 10.9 | 13.2 | 14.7 | 15.7 | 16.3 | 16.8 | 17.3 | 18.0 | 18.5 | 19.5 | 20.3 | 22.2 |
| 30 d | 150.1 | 181.1 | 200.9 | 211.9 | 219.4 | 225.2 | 229.9 | 237.1 | 242.7 | 252.6 | 259.5 | 275.9 |
| | 12.0 | 14.4 | 16.0 | 17.0 | 17.8 | 18.3 | 18.8 | 19.7 | 20.3 | 21.5 | 22.5 | 24.9 |

3. 95%-betrouwbaarheidsinterval van de geschatte neerslaghoeveelheid voor een neerslagduur van 10 minuten tot 30 dagen (rijen) en een terugkeerperiode van 2 tot 200 jaar (kolommen). Eenheid: mm.

| Duur | Terugkeerperiode (jaren) | | | | | | | | | | | |
|--------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2 | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 200 |
| 10 min | 7.1 | 10.1 | 12.2 | 13.5 | 14.3 | 15.0 | 15.5 | 16.4 | 17.0 | 18.2 | 19.1 | 21.1 |
| | 8.0 | 11.6 | 14.4 | 16.2 | 17.6 | 18.7 | 19.6 | 21.2 | 22.4 | 24.9 | 26.7 | 31.6 |
| 20 min | 10.1 | 14.3 | 17.3 | 19.1 | 20.4 | 21.3 | 22.1 | 23.4 | 24.4 | 26.1 | 27.4 | 30.4 |
| | 11.7 | 16.8 | 20.9 | 23.4 | 25.3 | 26.9 | 28.2 | 30.4 | 32.1 | 35.5 | 38.1 | 44.8 |
| 30 min | 11.9 | 17.3 | 21.1 | 23.4 | 25.0 | 26.3 | 27.4 | 29.1 | 30.4 | 32.8 | 34.6 | 39.1 |
| | 13.8 | 20.1 | 24.9 | 28.0 | 30.2 | 32.0 | 33.6 | 36.1 | 38.1 | 42.0 | 44.9 | 52.4 |
| 1 u | 14.8 | 20.5 | 24.5 | 26.8 | 28.5 | 29.7 | 30.8 | 32.5 | 33.8 | 36.2 | 37.9 | 42.0 |
| | 17.0 | 24.1 | 29.6 | 33.0 | 35.5 | 37.6 | 39.3 | 42.1 | 44.4 | 48.9 | 52.2 | 61.0 |
| 2 u | 17.7 | 24.0 | 28.5 | 31.1 | 33.0 | 34.5 | 35.7 | 37.5 | 39.0 | 41.7 | 43.6 | 48.2 |
| | 20.5 | 28.5 | 34.6 | 38.4 | 41.2 | 43.5 | 45.5 | 48.7 | 51.2 | 56.2 | 59.9 | 69.7 |
| 3 u | 19.5 | 26.7 | 31.9 | 34.9 | 37.1 | 38.8 | 40.2 | 42.4 | 44.1 | 47.3 | 49.6 | 55.1 |
| | 22.8 | 31.4 | 38.0 | 42.1 | 45.2 | 47.6 | 49.7 | 53.1 | 55.8 | 61.0 | 65.0 | 75.2 |
| 6 u | 23.5 | 31.3 | 36.7 | 39.8 | 42.0 | 43.6 | 45.0 | 47.1 | 48.7 | 51.6 | 53.6 | 58.4 |
| | 27.5 | 36.2 | 43.0 | 47.3 | 50.5 | 53.2 | 55.4 | 59.1 | 62.0 | 67.8 | 72.1 | 83.6 |
| 12 u | 28.2 | 37.6 | 44.0 | 47.7 | 50.2 | 52.1 | 53.7 | 56.1 | 58.0 | 61.3 | 63.6 | 68.9 |
| | 33.8 | 44.3 | 52.5 | 57.7 | 61.6 | 64.7 | 67.4 | 71.9 | 75.5 | 82.4 | 87.7 | 101.6 |
| 1 d | 34.5 | 45.5 | 53.1 | 57.6 | 60.7 | 63.2 | 65.2 | 68.4 | 70.8 | 75.4 | 78.6 | 86.5 |
| | 41.3 | 53.2 | 61.9 | 67.2 | 71.1 | 74.2 | 76.8 | 81.0 | 84.4 | 90.8 | 95.5 | 107.6 |
| 2 d | 42.6 | 55.0 | 63.3 | 68.0 | 71.2 | 73.7 | 75.7 | 78.9 | 81.3 | 85.7 | 88.7 | 95.9 |
| | 53.1 | 67.8 | 78.6 | 85.0 | 89.8 | 93.5 | 96.6 | 101.7 | 105.7 | 113.3 | 118.9 | 133.2 |
| 3 d | 44.2 | 57.1 | 65.6 | 70.4 | 73.8 | 76.3 | 78.4 | 81.7 | 84.1 | 88.6 | 91.7 | 99.1 |
| | 57.3 | 73.2 | 84.5 | 91.2 | 96.1 | 100.0 | 103.2 | 108.3 | 112.4 | 120.0 | 125.5 | 139.5 |
| 4 d | 47.5 | 61.3 | 70.5 | 75.7 | 79.3 | 82.1 | 84.4 | 87.9 | 90.7 | 95.6 | 99.0 | 107.2 |
| | 62.6 | 79.4 | 91.2 | 98.1 | 103.0 | 106.9 | 110.1 | 115.2 | 119.2 | 126.7 | 132.2 | 145.8 |
| 5 d | 53.8 | 68.5 | 78.3 | 83.8 | 87.7 | 90.7 | 93.1 | 96.9 | 99.8 | 105.1 | 108.8 | 117.5 |
| | 71.2 | 89.5 | 102.1 | 109.4 | 114.6 | 118.7 | 122.0 | 127.4 | 131.6 | 139.3 | 144.9 | 158.9 |
| 7 d | 61.3 | 77.3 | 87.9 | 93.8 | 98.0 | 101.2 | 103.8 | 107.9 | 111.0 | 116.7 | 120.6 | 130.1 |
| | 82.4 | 102.2 | 115.6 | 123.3 | 128.7 | 133.0 | 136.4 | 141.9 | 146.3 | 154.2 | 159.9 | 173.8 |
| 10 d | 72.2 | 89.1 | 100.3 | 106.6 | 110.9 | 114.3 | 117.0 | 121.2 | 124.5 | 130.3 | 134.4 | 144.1 |
| | 98.6 | 121.5 | 136.8 | 145.5 | 151.6 | 156.4 | 160.2 | 166.4 | 171.1 | 179.8 | 186.0 | 201.1 |
| 15 d | 87.1 | 107.1 | 120.1 | 127.4 | 132.5 | 136.4 | 139.6 | 144.5 | 148.3 | 155.2 | 160.0 | 171.4 |
| | 119.6 | 146.2 | 163.6 | 173.4 | 180.2 | 185.5 | 189.7 | 196.4 | 201.6 | 210.9 | 217.5 | 233.3 |
| 20 d | 101.3 | 124.3 | 139.2 | 147.4 | 153.2 | 157.5 | 161.1 | 166.6 | 170.8 | 178.3 | 183.6 | 196.0 |
| | 139.4 | 170.7 | 190.9 | 202.2 | 210.1 | 216.1 | 221.0 | 228.7 | 234.5 | 245.2 | 252.7 | 270.6 |
| 25 d | 106.8 | 131.1 | 146.6 | 155.1 | 160.9 | 165.3 | 168.9 | 174.4 | 178.6 | 186.0 | 191.1 | 202.9 |
| | 149.5 | 182.8 | 204.4 | 216.5 | 224.9 | 231.3 | 236.5 | 244.8 | 251.1 | 262.5 | 270.6 | 290.1 |
| 30 d | 126.4 | 153.0 | 169.6 | 178.5 | 184.6 | 189.2 | 192.9 | 198.6 | 202.9 | 210.4 | 215.5 | 227.2 |
| | 173.7 | 209.2 | 232.3 | 245.2 | 254.2 | 261.2 | 266.8 | 275.6 | 282.4 | 294.8 | 303.6 | 324.6 |

4. Schatting van de coëfficiënten van Montana.

Formule van Montana : intensiteit[mm/h] = $a \cdot \text{duur}[\text{min}]^{-b}$ voor verschillende tijdsduren

a_1, b_1 : duur < 25 min

a_2, b_2 : duur tussen 25 min en 6000 min (= 100 h)

a_3, b_3 : duur > 6000 min (= 100 h)

| Terugkeerperiode (jaren) | a_1 | b_1 | a_2 | b_2 | a_3 | b_3 |
|--------------------------|-------|--------|--------|--------|-------|--------|
| 2 | 134.1 | 0.4708 | 300.7 | 0.7216 | 53.0 | 0.5221 |
| 5 | 192.7 | 0.4716 | 464.2 | 0.7447 | 80.6 | 0.5434 |
| 10 | 235.3 | 0.4693 | 595.3 | 0.7577 | 105.3 | 0.5586 |
| 15 | 260.6 | 0.4674 | 678.5 | 0.7646 | 122.2 | 0.5675 |
| 20 | 279.0 | 0.4658 | 741.0 | 0.7693 | 135.4 | 0.5739 |
| 25 | 293.6 | 0.4645 | 791.8 | 0.7728 | 146.4 | 0.5788 |
| 30 | 305.6 | 0.4634 | 834.9 | 0.7756 | 156.0 | 0.5828 |
| 40 | 325.0 | 0.4616 | 905.8 | 0.7800 | 172.3 | 0.5892 |
| 50 | 340.4 | 0.4600 | 963.6 | 0.7833 | 185.9 | 0.5941 |
| 75 | 369.1 | 0.4571 | 1075.0 | 0.7893 | 213.1 | 0.6032 |
| 100 | 390.1 | 0.4550 | 1159.5 | 0.7934 | 234.5 | 0.6097 |
| 200 | 443.0 | 0.4494 | 1383.5 | 0.8032 | 294.4 | 0.6253 |

Referenties

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.

Disclaimer

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Zo niet, dan zijn de rechtbanken van het arrondissement Brussel bevoegd.