



Statistiek van de extreme neerslag voor de Belgische gemeenten

Niel (NIS 11030)

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 | 13.4 | 14.9 | 16.0 | 16.9 | 17.6 | 18.8 | 19.8 | 21.6 | 22.9 | 26.4 |
| 20 min | 10.9 | 15.6 | 19.2 | 21.3 | 22.9 | 24.2 | 25.3 | 27.0 | 28.3 | 30.9 | 32.9 | 37.8 |
| 30 min | 12.9 | 18.7 | 23.1 | 25.7 | 27.7 | 29.2 | 30.5 | 32.6 | 34.3 | 37.5 | 39.9 | 45.9 |
| 1 u | 16.0 | 22.4 | 27.1 | 30.0 | 32.1 | 33.8 | 35.2 | 37.5 | 39.3 | 42.7 | 45.2 | 51.7 |
| 2 u | 19.1 | 26.3 | 31.7 | 34.9 | 37.3 | 39.2 | 40.7 | 43.3 | 45.3 | 49.2 | 52.0 | 59.2 |
| 3 u | 21.2 | 29.2 | 35.1 | 38.7 | 41.3 | 43.4 | 45.1 | 47.9 | 50.1 | 54.4 | 57.5 | 65.4 |
| 6 u | 25.6 | 33.9 | 40.0 | 43.7 | 46.4 | 48.5 | 50.3 | 53.2 | 55.5 | 59.8 | 63.0 | 71.1 |
| 12 u | 31.2 | 41.1 | 48.4 | 52.8 | 56.0 | 58.6 | 60.7 | 64.1 | 66.9 | 72.0 | 75.8 | 85.4 |
| 1 d | 37.3 | 48.7 | 56.9 | 61.7 | 65.2 | 68.0 | 70.3 | 74.0 | 76.9 | 82.3 | 86.3 | 96.2 |
| 2 d | 46.9 | 60.3 | 69.7 | 75.3 | 79.2 | 82.3 | 84.9 | 88.9 | 92.1 | 98.0 | 102.3 | 112.9 |
| 3 d | 49.6 | 63.8 | 73.6 | 79.3 | 83.3 | 86.5 | 89.1 | 93.2 | 96.4 | 102.4 | 106.7 | 117.2 |
| 4 d | 53.7 | 68.8 | 79.1 | 85.1 | 89.3 | 92.6 | 95.3 | 99.5 | 102.9 | 109.0 | 113.3 | 124.1 |
| 5 d | 60.9 | 77.1 | 88.1 | 94.4 | 98.9 | 102.3 | 105.2 | 109.7 | 113.2 | 119.6 | 124.1 | 135.3 |
| 7 d | 69.9 | 87.5 | 99.2 | 106.0 | 110.7 | 114.3 | 117.3 | 122.0 | 125.7 | 132.3 | 137.1 | 148.6 |
| 10 d | 83.0 | 102.4 | 115.2 | 122.5 | 127.6 | 131.6 | 134.8 | 139.8 | 143.7 | 150.8 | 155.8 | 167.9 |
| 15 d | 100.4 | 123.1 | 137.9 | 146.3 | 152.1 | 156.5 | 160.1 | 165.8 | 170.2 | 178.0 | 183.6 | 196.9 |
| 20 d | 116.9 | 143.3 | 160.4 | 169.9 | 176.5 | 181.6 | 185.6 | 192.1 | 197.0 | 205.8 | 212.0 | 226.8 |
| 25 d | 124.2 | 152.3 | 170.3 | 180.3 | 187.3 | 192.6 | 196.8 | 203.5 | 208.6 | 217.8 | 224.2 | 239.5 |
| 30 d | 145.7 | 176.0 | 195.4 | 206.1 | 213.5 | 219.1 | 223.7 | 230.7 | 236.2 | 245.9 | 252.6 | 268.6 |

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 | 13.4 | 14.9 | 16.0 | 16.9 | 17.6 | 18.8 | 19.8 | 21.6 | 22.9 | 26.4 |
| | 0.2 | 0.3 | 0.5 | 0.7 | 0.8 | 0.9 | 1.0 | 1.2 | 1.3 | 1.7 | 1.9 | 2.7 |
| 20 min | 10.9 | 15.6 | 19.2 | 21.3 | 22.9 | 24.2 | 25.3 | 27.0 | 28.3 | 30.9 | 32.9 | 37.8 |
| | 0.3 | 0.5 | 0.7 | 0.9 | 1.1 | 1.2 | 1.4 | 1.6 | 1.8 | 2.2 | 2.5 | 3.5 |
| 30 min | 12.9 | 18.7 | 23.1 | 25.7 | 27.7 | 29.2 | 30.5 | 32.6 | 34.3 | 37.5 | 39.9 | 45.9 |
| | 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 u | 16.0 | 22.4 | 27.1 | 30.0 | 32.1 | 33.8 | 35.2 | 37.5 | 39.3 | 42.7 | 45.2 | 51.7 |
| | 0.4 | 0.7 | 1.0 | 1.2 | 1.5 | 1.6 | 1.8 | 2.1 | 2.4 | 2.9 | 3.3 | 4.5 |
| 2 u | 19.1 | 26.3 | 31.7 | 34.9 | 37.3 | 39.2 | 40.7 | 43.3 | 45.3 | 49.2 | 52.0 | 59.2 |
| | 0.5 | 0.8 | 1.1 | 1.4 | 1.7 | 1.9 | 2.1 | 2.4 | 2.7 | 3.2 | 3.7 | 5.0 |
| 3 u | 21.2 | 29.2 | 35.1 | 38.7 | 41.3 | 43.4 | 45.1 | 47.9 | 50.1 | 54.4 | 57.5 | 65.4 |
| | 0.6 | 0.9 | 1.2 | 1.5 | 1.7 | 1.9 | 2.1 | 2.4 | 2.6 | 3.1 | 3.6 | 4.8 |
| 6 u | 25.6 | 33.9 | 40.0 | 43.7 | 46.4 | 48.5 | 50.3 | 53.2 | 55.5 | 59.8 | 63.0 | 71.1 |
| | 0.7 | 1.0 | 1.3 | 1.7 | 2.0 | 2.2 | 2.5 | 2.9 | 3.2 | 4.0 | 4.6 | 6.3 |
| 12 u | 31.2 | 41.1 | 48.4 | 52.8 | 56.0 | 58.6 | 60.7 | 64.1 | 66.9 | 72.0 | 75.8 | 85.4 |
| | 0.9 | 1.3 | 1.8 | 2.3 | 2.6 | 3.0 | 3.3 | 3.8 | 4.3 | 5.2 | 6.0 | 8.2 |
| 1 d | 37.3 | 48.7 | 56.9 | 61.7 | 65.2 | 68.0 | 70.3 | 74.0 | 76.9 | 82.3 | 86.3 | 96.2 |
| | 1.4 | 1.7 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.1 | 3.3 | 3.8 | 4.2 | 5.3 |
| 2 d | 46.9 | 60.3 | 69.7 | 75.3 | 79.2 | 82.3 | 84.9 | 88.9 | 92.1 | 98.0 | 102.3 | 112.9 |
| | 2.1 | 2.7 | 3.4 | 3.9 | 4.3 | 4.6 | 4.9 | 5.4 | 5.9 | 6.7 | 7.4 | 9.3 |
| 3 d | 49.6 | 63.8 | 73.6 | 79.3 | 83.3 | 86.5 | 89.1 | 93.2 | 96.4 | 102.4 | 106.7 | 117.2 |
| | 2.6 | 3.4 | 4.1 | 4.6 | 5.0 | 5.3 | 5.6 | 6.1 | 6.5 | 7.4 | 8.0 | 9.8 |
| 4 d | 53.7 | 68.8 | 79.1 | 85.1 | 89.3 | 92.6 | 95.3 | 99.5 | 102.9 | 109.0 | 113.3 | 124.1 |
| | 3.0 | 3.7 | 4.3 | 4.7 | 5.1 | 5.4 | 5.6 | 6.0 | 6.4 | 7.0 | 7.6 | 9.0 |
| 5 d | 60.9 | 77.1 | 88.1 | 94.4 | 98.9 | 102.3 | 105.2 | 109.7 | 113.2 | 119.6 | 124.1 | 135.3 |
| | 3.5 | 4.2 | 4.9 | 5.3 | 5.6 | 5.9 | 6.1 | 6.5 | 6.8 | 7.4 | 7.9 | 9.2 |
| 7 d | 69.9 | 87.5 | 99.2 | 106.0 | 110.7 | 114.3 | 117.3 | 122.0 | 125.7 | 132.3 | 137.1 | 148.6 |
| | 4.2 | 5.0 | 5.6 | 6.0 | 6.3 | 6.6 | 6.8 | 7.1 | 7.4 | 8.0 | 8.4 | 9.5 |
| 10 d | 83.0 | 102.4 | 115.2 | 122.5 | 127.6 | 131.6 | 134.8 | 139.8 | 143.7 | 150.8 | 155.8 | 167.9 |
| | 5.2 | 6.4 | 7.3 | 7.8 | 8.2 | 8.5 | 8.8 | 9.2 | 9.5 | 10.2 | 10.7 | 12.0 |
| 15 d | 100.4 | 123.1 | 137.9 | 146.3 | 152.1 | 156.5 | 160.1 | 165.8 | 170.2 | 178.0 | 183.6 | 196.9 |
| | 6.4 | 7.8 | 8.7 | 9.2 | 9.5 | 9.8 | 10.0 | 10.4 | 10.7 | 11.2 | 11.6 | 12.5 |
| 20 d | 116.9 | 143.3 | 160.4 | 169.9 | 176.5 | 181.6 | 185.6 | 192.1 | 197.0 | 205.8 | 212.0 | 226.8 |
| | 7.6 | 9.2 | 10.3 | 11.0 | 11.4 | 11.8 | 12.0 | 12.5 | 12.9 | 13.5 | 14.0 | 15.2 |
| 25 d | 124.2 | 152.3 | 170.3 | 180.3 | 187.3 | 192.6 | 196.8 | 203.5 | 208.6 | 217.8 | 224.2 | 239.5 |
| | 8.4 | 10.3 | 11.6 | 12.4 | 13.0 | 13.4 | 13.8 | 14.4 | 14.9 | 15.9 | 16.6 | 18.4 |
| 30 d | 145.7 | 176.0 | 195.4 | 206.1 | 213.5 | 219.1 | 223.7 | 230.7 | 236.2 | 245.9 | 252.6 | 268.6 |
| | 9.4 | 11.3 | 12.7 | 13.7 | 14.4 | 14.9 | 15.4 | 16.2 | 16.8 | 18.0 | 18.9 | 21.3 |

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 | 7.2 | 10.2 | 12.3 | 13.6 | 14.4 | 15.1 | 15.6 | 16.5 | 17.1 | 18.3 | 19.2 | 21.2 |
| | 8.0 | 11.5 | 14.4 | 16.2 | 17.5 | 18.6 | 19.6 | 21.1 | 22.4 | 24.9 | 26.7 | 31.6 |
| 20 min | 10.3 | 14.7 | 17.8 | 19.6 | 20.8 | 21.8 | 22.6 | 23.8 | 24.8 | 26.6 | 27.9 | 30.9 |
| | 11.5 | 16.6 | 20.6 | 23.1 | 25.1 | 26.6 | 27.9 | 30.1 | 31.9 | 35.3 | 37.9 | 44.7 |
| 30 min | 12.1 | 17.6 | 21.5 | 23.8 | 25.4 | 26.7 | 27.8 | 29.5 | 30.8 | 33.3 | 35.1 | 39.5 |
| | 13.6 | 19.8 | 24.7 | 27.7 | 29.9 | 31.8 | 33.3 | 35.8 | 37.8 | 41.7 | 44.6 | 52.2 |
| 1 u | 15.2 | 21.0 | 25.2 | 27.6 | 29.2 | 30.6 | 31.6 | 33.3 | 34.7 | 37.1 | 38.8 | 42.9 |
| | 16.8 | 23.7 | 29.0 | 32.4 | 35.0 | 37.0 | 38.8 | 41.6 | 43.9 | 48.4 | 51.7 | 60.5 |
| 2 u | 18.2 | 24.8 | 29.4 | 32.1 | 34.0 | 35.5 | 36.7 | 38.6 | 40.1 | 42.8 | 44.7 | 49.3 |
| | 20.1 | 27.9 | 33.9 | 37.7 | 40.5 | 42.8 | 44.8 | 48.0 | 50.5 | 55.5 | 59.3 | 69.1 |
| 3 u | 20.0 | 27.5 | 32.7 | 35.8 | 38.0 | 39.7 | 41.1 | 43.3 | 45.0 | 48.2 | 50.5 | 56.1 |
| | 22.4 | 30.9 | 37.4 | 41.5 | 44.6 | 47.1 | 49.1 | 52.5 | 55.3 | 60.5 | 64.5 | 74.7 |
| 6 u | 24.3 | 32.0 | 37.4 | 40.4 | 42.5 | 44.2 | 45.5 | 47.6 | 49.2 | 52.0 | 54.0 | 58.8 |
| | 27.0 | 35.7 | 42.6 | 47.0 | 50.2 | 52.9 | 55.1 | 58.8 | 61.8 | 67.6 | 72.0 | 83.5 |
| 12 u | 29.3 | 38.5 | 44.8 | 48.4 | 50.9 | 52.7 | 54.3 | 56.7 | 58.5 | 61.7 | 64.0 | 69.3 |
| | 33.0 | 43.6 | 52.0 | 57.2 | 61.2 | 64.4 | 67.1 | 71.6 | 75.3 | 82.3 | 87.6 | 101.5 |
| 1 d | 34.6 | 45.4 | 53.0 | 57.4 | 60.5 | 62.9 | 64.9 | 68.0 | 70.4 | 74.9 | 78.1 | 85.8 |
| | 40.1 | 52.0 | 60.7 | 66.1 | 70.0 | 73.1 | 75.8 | 80.0 | 83.4 | 89.8 | 94.5 | 106.6 |
| 2 d | 42.7 | 55.0 | 63.1 | 67.7 | 70.8 | 73.2 | 75.2 | 78.3 | 80.6 | 84.8 | 87.8 | 94.8 |
| | 51.1 | 65.7 | 76.4 | 82.9 | 87.6 | 91.4 | 94.5 | 99.6 | 103.6 | 111.2 | 116.8 | 131.0 |
| 3 d | 44.4 | 57.2 | 65.6 | 70.3 | 73.5 | 76.0 | 78.0 | 81.2 | 83.6 | 87.9 | 90.9 | 98.1 |
| | 54.8 | 70.3 | 81.5 | 88.2 | 93.1 | 96.9 | 100.1 | 105.2 | 109.3 | 116.8 | 122.4 | 136.3 |
| 4 d | 47.8 | 61.5 | 70.6 | 75.8 | 79.3 | 82.1 | 84.3 | 87.7 | 90.4 | 95.2 | 98.5 | 106.5 |
| | 59.7 | 76.1 | 87.6 | 94.4 | 99.2 | 103.1 | 106.2 | 111.3 | 115.3 | 122.7 | 128.1 | 141.7 |
| 5 d | 54.1 | 68.8 | 78.5 | 84.0 | 87.9 | 90.8 | 93.2 | 97.0 | 99.8 | 105.0 | 108.6 | 117.2 |
| | 67.7 | 85.4 | 97.7 | 104.8 | 109.9 | 113.9 | 117.1 | 122.4 | 126.5 | 134.1 | 139.7 | 153.4 |
| 7 d | 61.7 | 77.7 | 88.2 | 94.2 | 98.3 | 101.5 | 104.1 | 108.1 | 111.2 | 116.7 | 120.6 | 129.9 |
| | 78.1 | 97.2 | 110.2 | 117.7 | 123.0 | 127.2 | 130.6 | 136.0 | 140.2 | 148.0 | 153.5 | 167.3 |
| 10 d | 72.7 | 89.8 | 101.0 | 107.2 | 111.6 | 114.9 | 117.6 | 121.8 | 125.0 | 130.8 | 134.9 | 144.4 |
| | 93.2 | 115.0 | 129.5 | 137.8 | 143.7 | 148.2 | 152.0 | 157.8 | 162.4 | 170.7 | 176.7 | 191.3 |
| 15 d | 87.8 | 107.9 | 121.0 | 128.3 | 133.4 | 137.3 | 140.5 | 145.5 | 149.3 | 156.1 | 160.9 | 172.4 |
| | 113.0 | 138.3 | 154.9 | 164.2 | 170.7 | 175.7 | 179.8 | 186.1 | 191.0 | 199.9 | 206.2 | 221.4 |
| 20 d | 102.1 | 125.2 | 140.1 | 148.4 | 154.1 | 158.5 | 162.0 | 167.6 | 171.8 | 179.3 | 184.6 | 196.9 |
| | 131.7 | 161.4 | 180.6 | 191.4 | 198.9 | 204.6 | 209.2 | 216.5 | 222.2 | 232.3 | 239.5 | 256.7 |
| 25 d | 107.6 | 132.1 | 147.6 | 156.0 | 161.8 | 166.2 | 169.7 | 175.2 | 179.3 | 186.6 | 191.7 | 203.3 |
| | 140.8 | 172.5 | 193.1 | 204.6 | 212.7 | 218.9 | 223.9 | 231.8 | 237.9 | 249.0 | 256.8 | 275.6 |
| 30 d | 127.4 | 153.9 | 170.4 | 179.3 | 185.3 | 189.9 | 193.5 | 199.0 | 203.2 | 210.5 | 215.5 | 226.8 |
| | 164.1 | 198.2 | 220.4 | 232.9 | 241.6 | 248.4 | 253.8 | 262.5 | 269.1 | 281.2 | 289.8 | 310.4 |

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 | 130.8 | 0.4596 | 310.0 | 0.7277 | 53.9 | 0.5267 |
| 5 | 188.1 | 0.4607 | 477.9 | 0.7504 | 82.7 | 0.5487 |
| 10 | 229.8 | 0.4587 | 612.4 | 0.7632 | 108.5 | 0.5643 |
| 15 | 254.6 | 0.4569 | 697.7 | 0.7700 | 126.1 | 0.5734 |
| 20 | 272.6 | 0.4554 | 761.8 | 0.7746 | 139.9 | 0.5799 |
| 25 | 286.9 | 0.4541 | 813.9 | 0.7781 | 151.5 | 0.5848 |
| 30 | 298.7 | 0.4530 | 858.0 | 0.7809 | 161.5 | 0.5889 |
| 40 | 317.7 | 0.4512 | 930.8 | 0.7852 | 178.5 | 0.5954 |
| 50 | 332.7 | 0.4497 | 990.0 | 0.7885 | 192.8 | 0.6004 |
| 75 | 360.8 | 0.4469 | 1104.2 | 0.7944 | 221.2 | 0.6096 |
| 100 | 381.4 | 0.4448 | 1190.8 | 0.7985 | 243.6 | 0.6161 |
| 200 | 433.2 | 0.4393 | 1420.4 | 0.8082 | 306.4 | 0.6319 |

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

De rechten van intellectuele eigendom met betrekking tot de gegevens in tabellen, teksten en grafieken komen uitsluitend toe aan het KMI. De publicatie van deze gegevens op de website van het KMI strekt niet tot gehele of gedeeltelijke overdracht van deze rechten.

De Gebruiker van de gegevens verbindt er zich toe om, in elke publicatie waarin gebruik gemaakt wordt van de gegevens, het KMI als bron van deze gegevens te vermelden.

Het is in geen geval toegestaan om op basis van de gegevens in tabellen, teksten en grafieken meteorologische of klimatologische diensten te verstrekken.

Het KMI zal in geen geval aansprakelijk gesteld kunnen worden voor de eventuele schade die uit het gebruik van de gegevens zou kunnen voortvloeien.

In geval van een geschil betreffende de interpretatie of de uitvoering van deze algemene voorwaarden, zullen het KMI en de Gebruiker trachten het geschil zo spoedig mogelijk in der minne te regelen.

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