



Statistiek van de extreme neerslag voor de Belgische gemeenten

Waimes (NIS 63080)

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 | 8.5 | 12.1 | 14.8 | 16.5 | 17.7 | 18.7 | 19.5 | 20.9 | 21.9 | 24.0 | 25.4 | 29.3 |
| 20 min | 12.9 | 18.8 | 23.2 | 25.9 | 27.9 | 29.4 | 30.8 | 32.9 | 34.6 | 37.8 | 40.2 | 46.3 |
| 30 min | 15.0 | 21.8 | 26.9 | 30.0 | 32.3 | 34.1 | 35.6 | 38.0 | 40.0 | 43.7 | 46.4 | 53.4 |
| 1 u | 18.7 | 27.0 | 33.2 | 36.9 | 39.7 | 41.9 | 43.7 | 46.6 | 49.0 | 53.4 | 56.7 | 65.2 |
| 2 u | 22.9 | 32.3 | 39.3 | 43.5 | 46.6 | 49.1 | 51.1 | 54.5 | 57.1 | 62.1 | 65.8 | 75.2 |
| 3 u | 25.5 | 35.1 | 42.2 | 46.6 | 49.7 | 52.2 | 54.3 | 57.7 | 60.4 | 65.5 | 69.2 | 78.8 |
| 6 u | 31.0 | 39.8 | 46.3 | 50.3 | 53.1 | 55.4 | 57.3 | 60.4 | 62.8 | 67.5 | 70.9 | 79.5 |
| 12 u | 38.8 | 49.1 | 56.7 | 61.2 | 64.6 | 67.2 | 69.4 | 73.0 | 75.8 | 81.1 | 85.0 | 95.0 |
| 1 d | 48.5 | 60.5 | 69.1 | 74.2 | 78.0 | 80.9 | 83.3 | 87.2 | 90.3 | 96.0 | 100.2 | 110.7 |
| 2 d | 64.8 | 80.6 | 91.7 | 98.2 | 102.9 | 106.5 | 109.5 | 114.3 | 118.1 | 125.1 | 130.1 | 142.6 |
| 3 d | 71.4 | 89.1 | 101.3 | 108.4 | 113.5 | 117.4 | 120.7 | 125.8 | 129.9 | 137.3 | 142.6 | 155.8 |
| 4 d | 78.9 | 98.1 | 111.2 | 118.8 | 124.2 | 128.4 | 131.9 | 137.3 | 141.6 | 149.4 | 155.0 | 168.7 |
| 5 d | 89.8 | 111.4 | 126.2 | 134.6 | 140.6 | 145.2 | 149.0 | 155.0 | 159.7 | 168.3 | 174.4 | 189.3 |
| 7 d | 105.4 | 128.9 | 144.7 | 153.7 | 160.0 | 164.9 | 168.9 | 175.2 | 180.1 | 189.1 | 195.4 | 210.9 |
| 10 d | 127.5 | 156.7 | 176.0 | 187.0 | 194.6 | 200.6 | 205.4 | 212.9 | 218.8 | 229.4 | 237.0 | 255.1 |
| 15 d | 155.2 | 188.8 | 210.8 | 223.1 | 231.7 | 238.3 | 243.7 | 252.1 | 258.5 | 270.2 | 278.4 | 298.1 |
| 20 d | 181.0 | 220.8 | 246.6 | 261.0 | 271.0 | 278.6 | 284.8 | 294.5 | 301.9 | 315.3 | 324.7 | 347.0 |
| 25 d | 196.2 | 238.4 | 265.4 | 280.4 | 290.8 | 298.8 | 305.2 | 315.2 | 322.9 | 336.7 | 346.3 | 369.1 |
| 30 d | 225.4 | 269.1 | 297.0 | 312.5 | 323.1 | 331.2 | 337.8 | 348.0 | 355.8 | 369.8 | 379.6 | 402.7 |

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 | 8.5 | 12.1 | 14.8 | 16.5 | 17.7 | 18.7 | 19.5 | 20.9 | 21.9 | 24.0 | 25.4 | 29.3 |
| | 0.4 | 0.7 | 0.9 | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 2.0 | 2.4 | 2.7 | 3.5 |
| 20 min | 12.9 | 18.8 | 23.2 | 25.9 | 27.9 | 29.4 | 30.8 | 32.9 | 34.6 | 37.8 | 40.2 | 46.3 |
| | 0.6 | 1.1 | 1.6 | 2.0 | 2.2 | 2.5 | 2.7 | 3.1 | 3.4 | 4.0 | 4.5 | 5.9 |
| 30 min | 15.0 | 21.8 | 26.9 | 30.0 | 32.3 | 34.1 | 35.6 | 38.0 | 40.0 | 43.7 | 46.4 | 53.4 |
| | 0.7 | 1.1 | 1.5 | 1.7 | 1.9 | 2.0 | 2.1 | 2.4 | 2.5 | 2.9 | 3.2 | 4.0 |
| 1 u | 18.7 | 27.0 | 33.2 | 36.9 | 39.7 | 41.9 | 43.7 | 46.6 | 49.0 | 53.4 | 56.7 | 65.2 |
| | 0.9 | 1.3 | 1.8 | 2.2 | 2.5 | 2.7 | 2.9 | 3.3 | 3.6 | 4.3 | 4.8 | 6.2 |
| 2 u | 22.9 | 32.3 | 39.3 | 43.5 | 46.6 | 49.1 | 51.1 | 54.5 | 57.1 | 62.1 | 65.8 | 75.2 |
| | 1.0 | 1.5 | 2.1 | 2.5 | 2.8 | 3.0 | 3.3 | 3.7 | 4.0 | 4.7 | 5.3 | 6.9 |
| 3 u | 25.5 | 35.1 | 42.2 | 46.6 | 49.7 | 52.2 | 54.3 | 57.7 | 60.4 | 65.5 | 69.2 | 78.8 |
| | 1.1 | 1.6 | 2.2 | 2.5 | 2.8 | 3.0 | 3.2 | 3.6 | 3.9 | 4.5 | 4.9 | 6.2 |
| 6 u | 31.0 | 39.8 | 46.3 | 50.3 | 53.1 | 55.4 | 57.3 | 60.4 | 62.8 | 67.5 | 70.9 | 79.5 |
| | 1.2 | 1.7 | 2.2 | 2.5 | 2.8 | 3.1 | 3.4 | 3.8 | 4.1 | 4.9 | 5.5 | 7.3 |
| 12 u | 38.8 | 49.1 | 56.7 | 61.2 | 64.6 | 67.2 | 69.4 | 73.0 | 75.8 | 81.1 | 85.0 | 95.0 |
| | 1.5 | 2.0 | 2.7 | 3.2 | 3.7 | 4.0 | 4.4 | 5.0 | 5.5 | 6.5 | 7.4 | 9.8 |
| 1 d | 48.5 | 60.5 | 69.1 | 74.2 | 78.0 | 80.9 | 83.3 | 87.2 | 90.3 | 96.0 | 100.2 | 110.7 |
| | 1.6 | 1.9 | 2.1 | 2.3 | 2.5 | 2.6 | 2.7 | 3.0 | 3.1 | 3.5 | 3.8 | 4.8 |
| 2 d | 64.8 | 80.6 | 91.7 | 98.2 | 102.9 | 106.5 | 109.5 | 114.3 | 118.1 | 125.1 | 130.1 | 142.6 |
| | 2.4 | 3.1 | 3.7 | 4.1 | 4.4 | 4.7 | 4.9 | 5.3 | 5.7 | 6.4 | 7.0 | 8.6 |
| 3 d | 71.4 | 89.1 | 101.3 | 108.4 | 113.5 | 117.4 | 120.7 | 125.8 | 129.9 | 137.3 | 142.6 | 155.8 |
| | 3.1 | 3.9 | 4.7 | 5.2 | 5.5 | 5.9 | 6.1 | 6.6 | 7.0 | 7.8 | 8.4 | 10.0 |
| 4 d | 78.9 | 98.1 | 111.2 | 118.8 | 124.2 | 128.4 | 131.9 | 137.3 | 141.6 | 149.4 | 155.0 | 168.7 |
| | 3.5 | 4.4 | 5.2 | 5.7 | 6.1 | 6.4 | 6.6 | 7.1 | 7.4 | 8.2 | 8.7 | 10.2 |
| 5 d | 89.8 | 111.4 | 126.2 | 134.6 | 140.6 | 145.2 | 149.0 | 155.0 | 159.7 | 168.3 | 174.4 | 189.3 |
| | 4.0 | 5.2 | 6.2 | 6.8 | 7.2 | 7.6 | 7.9 | 8.4 | 8.8 | 9.6 | 10.2 | 11.8 |
| 7 d | 105.4 | 128.9 | 144.7 | 153.7 | 160.0 | 164.9 | 168.9 | 175.2 | 180.1 | 189.1 | 195.4 | 210.9 |
| | 4.8 | 6.0 | 6.9 | 7.5 | 7.9 | 8.3 | 8.5 | 9.0 | 9.4 | 10.1 | 10.6 | 12.0 |
| 10 d | 127.5 | 156.7 | 176.0 | 187.0 | 194.6 | 200.6 | 205.4 | 212.9 | 218.8 | 229.4 | 237.0 | 255.1 |
| | 6.2 | 7.9 | 9.1 | 9.8 | 10.4 | 10.8 | 11.2 | 11.8 | 12.3 | 13.2 | 13.8 | 15.6 |
| 15 d | 155.2 | 188.8 | 210.8 | 223.1 | 231.7 | 238.3 | 243.7 | 252.1 | 258.5 | 270.2 | 278.4 | 298.1 |
| | 7.5 | 9.2 | 10.5 | 11.3 | 11.8 | 12.2 | 12.6 | 13.2 | 13.6 | 14.4 | 15.0 | 16.5 |
| 20 d | 181.0 | 220.8 | 246.6 | 261.0 | 271.0 | 278.6 | 284.8 | 294.5 | 301.9 | 315.3 | 324.7 | 347.0 |
| | 8.8 | 10.9 | 12.4 | 13.3 | 13.9 | 14.4 | 14.7 | 15.4 | 15.9 | 16.8 | 17.4 | 19.1 |
| 25 d | 196.2 | 238.4 | 265.4 | 280.4 | 290.8 | 298.8 | 305.2 | 315.2 | 322.9 | 336.7 | 346.3 | 369.1 |
| | 9.8 | 12.3 | 14.2 | 15.3 | 16.1 | 16.8 | 17.3 | 18.2 | 18.9 | 20.2 | 21.2 | 23.7 |
| 30 d | 225.4 | 269.1 | 297.0 | 312.5 | 323.1 | 331.2 | 337.8 | 348.0 | 355.8 | 369.8 | 379.6 | 402.7 |
| | 10.5 | 12.9 | 14.7 | 15.9 | 16.7 | 17.4 | 17.9 | 18.8 | 19.6 | 21.0 | 22.1 | 24.8 |

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 | 7.7 | 10.8 | 13.0 | 14.3 | 15.2 | 15.9 | 16.4 | 17.3 | 18.0 | 19.3 | 20.2 | 22.4 |
| | 9.3 | 13.4 | 16.7 | 18.8 | 20.3 | 21.6 | 22.7 | 24.4 | 25.8 | 28.6 | 30.7 | 36.2 |
| 20 min | 11.7 | 16.6 | 20.1 | 22.1 | 23.5 | 24.5 | 25.4 | 26.9 | 27.9 | 29.9 | 31.4 | 34.8 |
| | 14.1 | 20.9 | 26.3 | 29.7 | 32.3 | 34.3 | 36.1 | 38.9 | 41.2 | 45.7 | 49.1 | 57.9 |
| 30 min | 13.6 | 19.7 | 24.1 | 26.7 | 28.6 | 30.1 | 31.4 | 33.4 | 35.0 | 38.0 | 40.2 | 45.7 |
| | 16.5 | 24.0 | 29.8 | 33.3 | 35.9 | 38.0 | 39.8 | 42.7 | 45.0 | 49.4 | 52.6 | 61.2 |
| 1 u | 17.1 | 24.4 | 29.6 | 32.6 | 34.8 | 36.5 | 37.9 | 40.1 | 41.9 | 45.1 | 47.4 | 53.0 |
| | 20.4 | 29.6 | 36.8 | 41.2 | 44.6 | 47.2 | 49.5 | 53.1 | 56.1 | 61.8 | 66.1 | 77.3 |
| 2 u | 21.0 | 29.3 | 35.2 | 38.7 | 41.2 | 43.1 | 44.7 | 47.3 | 49.2 | 52.9 | 55.5 | 61.8 |
| | 24.9 | 35.3 | 43.3 | 48.3 | 52.0 | 55.0 | 57.5 | 61.6 | 65.0 | 71.3 | 76.1 | 88.7 |
| 3 u | 23.4 | 31.9 | 38.0 | 41.6 | 44.2 | 46.3 | 48.0 | 50.7 | 52.8 | 56.7 | 59.6 | 66.6 |
| | 27.6 | 38.3 | 46.5 | 51.5 | 55.2 | 58.2 | 60.7 | 64.7 | 68.0 | 74.2 | 78.9 | 91.0 |
| 6 u | 28.6 | 36.5 | 42.0 | 45.3 | 47.6 | 49.3 | 50.7 | 53.0 | 54.7 | 57.9 | 60.1 | 65.3 |
| | 33.4 | 43.1 | 50.6 | 55.2 | 58.7 | 61.5 | 63.9 | 67.8 | 71.0 | 77.0 | 81.6 | 93.7 |
| 12 u | 35.9 | 45.1 | 51.4 | 54.9 | 57.4 | 59.3 | 60.8 | 63.2 | 65.0 | 68.3 | 70.5 | 75.8 |
| | 41.7 | 53.1 | 62.0 | 67.6 | 71.7 | 75.1 | 78.0 | 82.7 | 86.6 | 93.9 | 99.5 | 114.2 |
| 1 d | 45.4 | 56.8 | 64.9 | 69.7 | 73.1 | 75.7 | 77.9 | 81.4 | 84.1 | 89.1 | 92.6 | 101.4 |
| | 51.6 | 64.2 | 73.3 | 78.8 | 82.8 | 86.0 | 88.7 | 93.0 | 96.4 | 102.9 | 107.7 | 120.0 |
| 2 d | 60.1 | 74.6 | 84.6 | 90.3 | 94.3 | 97.4 | 99.9 | 103.9 | 106.9 | 112.5 | 116.4 | 125.7 |
| | 69.6 | 86.7 | 98.9 | 106.2 | 111.5 | 115.7 | 119.2 | 124.8 | 129.3 | 137.7 | 143.8 | 159.5 |
| 3 d | 65.3 | 81.3 | 92.2 | 98.3 | 102.6 | 105.9 | 108.6 | 112.9 | 116.2 | 122.1 | 126.2 | 136.1 |
| | 77.4 | 96.8 | 110.4 | 118.5 | 124.3 | 128.9 | 132.7 | 138.8 | 143.6 | 152.5 | 159.0 | 175.4 |
| 4 d | 72.0 | 89.4 | 101.0 | 107.7 | 112.3 | 115.9 | 118.8 | 123.4 | 127.0 | 133.4 | 137.9 | 148.7 |
| | 85.7 | 106.8 | 121.4 | 130.0 | 136.1 | 140.9 | 144.9 | 151.2 | 156.2 | 165.4 | 172.0 | 188.6 |
| 5 d | 81.9 | 101.2 | 114.1 | 121.4 | 126.5 | 130.4 | 133.6 | 138.6 | 142.5 | 149.5 | 154.4 | 166.1 |
| | 97.7 | 121.7 | 138.2 | 147.8 | 154.7 | 160.0 | 164.4 | 171.5 | 176.9 | 187.1 | 194.4 | 212.5 |
| 7 d | 95.9 | 117.1 | 131.1 | 138.9 | 144.5 | 148.7 | 152.2 | 157.6 | 161.8 | 169.3 | 174.7 | 187.4 |
| | 114.8 | 140.7 | 158.3 | 168.4 | 175.6 | 181.1 | 185.7 | 192.9 | 198.5 | 208.8 | 216.2 | 234.3 |
| 10 d | 115.3 | 141.3 | 158.2 | 167.7 | 174.3 | 179.3 | 183.4 | 189.9 | 194.8 | 203.7 | 209.9 | 224.6 |
| | 139.7 | 172.1 | 193.9 | 206.3 | 215.0 | 221.8 | 227.3 | 236.0 | 242.8 | 255.2 | 264.1 | 285.6 |
| 15 d | 140.6 | 170.7 | 190.2 | 201.1 | 208.6 | 214.3 | 219.0 | 226.3 | 231.9 | 241.9 | 249.0 | 265.7 |
| | 169.9 | 206.9 | 231.4 | 245.2 | 254.9 | 262.3 | 268.4 | 277.8 | 285.2 | 298.5 | 307.9 | 330.5 |
| 20 d | 163.7 | 199.4 | 222.3 | 235.0 | 243.8 | 250.5 | 255.9 | 264.4 | 270.8 | 282.4 | 290.5 | 309.5 |
| | 198.2 | 242.2 | 270.9 | 287.0 | 298.2 | 306.8 | 313.7 | 324.6 | 333.0 | 348.2 | 358.9 | 384.5 |
| 25 d | 177.0 | 214.2 | 237.7 | 250.5 | 259.3 | 265.9 | 271.3 | 279.6 | 285.9 | 297.1 | 304.8 | 322.7 |
| | 215.4 | 262.5 | 293.2 | 310.4 | 322.4 | 331.6 | 339.1 | 350.8 | 359.9 | 376.2 | 387.8 | 415.6 |
| 30 d | 204.9 | 243.8 | 268.2 | 281.4 | 290.4 | 297.2 | 302.7 | 311.1 | 317.4 | 328.6 | 336.3 | 354.0 |
| | 245.9 | 294.4 | 325.9 | 343.5 | 355.8 | 365.3 | 372.9 | 384.9 | 394.2 | 411.0 | 422.9 | 451.4 |

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 | 149.7 | 0.4651 | 302.2 | 0.6833 | 49.6 | 0.4757 |
| 5 | 205.6 | 0.4470 | 487.7 | 0.7153 | 63.0 | 0.4800 |
| 10 | 246.2 | 0.4367 | 637.9 | 0.7325 | 75.5 | 0.4872 |
| 15 | 270.4 | 0.4312 | 733.7 | 0.7413 | 84.1 | 0.4923 |
| 20 | 287.9 | 0.4274 | 806.0 | 0.7472 | 90.8 | 0.4962 |
| 25 | 301.8 | 0.4245 | 864.7 | 0.7516 | 96.4 | 0.4993 |
| 30 | 313.3 | 0.4222 | 914.5 | 0.7551 | 101.2 | 0.5020 |
| 40 | 331.7 | 0.4186 | 996.8 | 0.7604 | 109.4 | 0.5064 |
| 50 | 346.4 | 0.4159 | 1063.9 | 0.7645 | 116.2 | 0.5099 |
| 75 | 373.7 | 0.4109 | 1193.4 | 0.7716 | 129.8 | 0.5166 |
| 100 | 393.8 | 0.4074 | 1291.7 | 0.7765 | 140.5 | 0.5215 |
| 200 | 444.2 | 0.3991 | 1553.0 | 0.7880 | 170.0 | 0.5337 |

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.