



# Statistiques des précipitations extrêmes des communes belges

Lendelede (INS 34025)

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 | 7.5                        | 10.8  | 13.3  | 14.8  | 15.9  | 16.8  | 17.5  | 18.7  | 19.7  | 21.5  | 22.8  | 26.3  |
| 20 min | 10.8                       | 15.5  | 19.0  | 21.1  | 22.7  | 23.9  | 25.0  | 26.7  | 28.0  | 30.6  | 32.5  | 37.4  |
| 30 min | 12.8                       | 18.6  | 22.9  | 25.5  | 27.5  | 29.0  | 30.3  | 32.4  | 34.1  | 37.2  | 39.5  | 45.5  |
| 1 h    | 15.9                       | 22.1  | 26.8  | 29.7  | 31.7  | 33.4  | 34.8  | 37.0  | 38.8  | 42.2  | 44.7  | 51.1  |
| 2 h    | 18.9                       | 26.0  | 31.3  | 34.5  | 36.8  | 38.7  | 40.2  | 42.7  | 44.7  | 48.5  | 51.3  | 58.4  |
| 3 h    | 21.0                       | 28.9  | 34.7  | 38.3  | 40.9  | 42.9  | 44.6  | 47.4  | 49.6  | 53.8  | 56.9  | 64.7  |
| 6 h    | 25.3                       | 33.6  | 39.7  | 43.4  | 46.0  | 48.2  | 50.0  | 52.8  | 55.1  | 59.4  | 62.6  | 70.7  |
| 12 h   | 30.8                       | 40.7  | 48.0  | 52.4  | 55.6  | 58.2  | 60.3  | 63.7  | 66.4  | 71.6  | 75.3  | 84.9  |
| 1 j    | 37.5                       | 48.9  | 57.1  | 61.9  | 65.4  | 68.2  | 70.5  | 74.2  | 77.1  | 82.6  | 86.5  | 96.5  |
| 2 j    | 47.2                       | 60.6  | 70.1  | 75.6  | 79.6  | 82.7  | 85.3  | 89.3  | 92.5  | 98.5  | 102.8 | 113.4 |
| 3 j    | 50.0                       | 64.2  | 74.0  | 79.7  | 83.8  | 87.0  | 89.6  | 93.7  | 97.0  | 103.0 | 107.2 | 117.8 |
| 4 j    | 54.1                       | 69.3  | 79.6  | 85.6  | 89.8  | 93.1  | 95.9  | 100.1 | 103.5 | 109.6 | 114.0 | 124.8 |
| 5 j    | 61.4                       | 77.7  | 88.7  | 95.1  | 99.6  | 103.0 | 105.9 | 110.4 | 113.9 | 120.4 | 124.9 | 136.2 |
| 7 j    | 70.5                       | 88.1  | 100.0 | 106.7 | 111.5 | 115.2 | 118.2 | 122.9 | 126.6 | 133.3 | 138.0 | 149.6 |
| 10 j   | 83.7                       | 103.2 | 116.2 | 123.6 | 128.7 | 132.7 | 135.9 | 141.0 | 144.9 | 152.1 | 157.1 | 169.3 |
| 15 j   | 101.3                      | 124.2 | 139.1 | 147.5 | 153.4 | 157.8 | 161.5 | 167.2 | 171.6 | 179.5 | 185.1 | 198.5 |
| 20 j   | 118.0                      | 144.5 | 161.8 | 171.4 | 178.0 | 183.1 | 187.3 | 193.7 | 198.7 | 207.6 | 213.9 | 228.8 |
| 25 j   | 125.4                      | 153.7 | 171.9 | 182.0 | 189.0 | 194.3 | 198.6 | 205.3 | 210.5 | 219.7 | 226.2 | 241.6 |
| 30 j   | 147.0                      | 177.6 | 197.1 | 207.8 | 215.3 | 220.9 | 225.5 | 232.7 | 238.1 | 247.9 | 254.7 | 270.8 |

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 | 7.5                        | 10.8  | 13.3  | 14.8  | 15.9  | 16.8  | 17.5  | 18.7  | 19.7  | 21.5  | 22.8  | 26.3  |
|        | 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 | 10.8                       | 15.5  | 19.0  | 21.1  | 22.7  | 23.9  | 25.0  | 26.7  | 28.0  | 30.6  | 32.5  | 37.4  |
|        | 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 | 12.8                       | 18.6  | 22.9  | 25.5  | 27.5  | 29.0  | 30.3  | 32.4  | 34.1  | 37.2  | 39.5  | 45.5  |
|        | 0.4                        | 0.6   | 0.8   | 1.0   | 1.2   | 1.3   | 1.5   | 1.7   | 1.8   | 2.2   | 2.5   | 3.3   |
| 1 h    | 15.9                       | 22.1  | 26.8  | 29.7  | 31.7  | 33.4  | 34.8  | 37.0  | 38.8  | 42.2  | 44.7  | 51.1  |
|        | 0.4                        | 0.7   | 1.0   | 1.3   | 1.5   | 1.7   | 1.9   | 2.2   | 2.4   | 2.9   | 3.4   | 4.5   |
| 2 h    | 18.9                       | 26.0  | 31.3  | 34.5  | 36.8  | 38.7  | 40.2  | 42.7  | 44.7  | 48.5  | 51.3  | 58.4  |
|        | 0.5                        | 0.8   | 1.2   | 1.5   | 1.7   | 1.9   | 2.1   | 2.5   | 2.7   | 3.3   | 3.8   | 5.1   |
| 3 h    | 21.0                       | 28.9  | 34.7  | 38.3  | 40.9  | 42.9  | 44.6  | 47.4  | 49.6  | 53.8  | 56.9  | 64.7  |
|        | 0.6                        | 0.9   | 1.3   | 1.5   | 1.8   | 2.0   | 2.1   | 2.4   | 2.7   | 3.2   | 3.7   | 4.8   |
| 6 h    | 25.3                       | 33.6  | 39.7  | 43.4  | 46.0  | 48.2  | 50.0  | 52.8  | 55.1  | 59.4  | 62.6  | 70.7  |
|        | 0.7                        | 1.0   | 1.4   | 1.7   | 2.0   | 2.3   | 2.5   | 2.9   | 3.3   | 4.0   | 4.6   | 6.3   |
| 12 h   | 30.8                       | 40.7  | 48.0  | 52.4  | 55.6  | 58.2  | 60.3  | 63.7  | 66.4  | 71.6  | 75.3  | 84.9  |
|        | 1.0                        | 1.4   | 1.9   | 2.3   | 2.7   | 3.0   | 3.3   | 3.9   | 4.3   | 5.3   | 6.0   | 8.2   |
| 1 j    | 37.5                       | 48.9  | 57.1  | 61.9  | 65.4  | 68.2  | 70.5  | 74.2  | 77.1  | 82.6  | 86.5  | 96.5  |
|        | 1.1                        | 1.4   | 1.7   | 2.0   | 2.2   | 2.4   | 2.6   | 2.9   | 3.1   | 3.6   | 4.0   | 5.2   |
| 2 j    | 47.2                       | 60.6  | 70.1  | 75.6  | 79.6  | 82.7  | 85.3  | 89.3  | 92.5  | 98.5  | 102.8 | 113.4 |
|        | 1.6                        | 2.2   | 2.9   | 3.4   | 3.8   | 4.2   | 4.5   | 5.0   | 5.5   | 6.4   | 7.0   | 8.9   |
| 3 j    | 50.0                       | 64.2  | 74.0  | 79.7  | 83.8  | 87.0  | 89.6  | 93.7  | 97.0  | 103.0 | 107.2 | 117.8 |
|        | 2.0                        | 2.7   | 3.4   | 3.9   | 4.3   | 4.7   | 5.0   | 5.5   | 5.9   | 6.8   | 7.4   | 9.2   |
| 4 j    | 54.1                       | 69.3  | 79.6  | 85.6  | 89.8  | 93.1  | 95.9  | 100.1 | 103.5 | 109.6 | 114.0 | 124.8 |
|        | 2.2                        | 2.9   | 3.4   | 3.9   | 4.2   | 4.5   | 4.7   | 5.2   | 5.5   | 6.2   | 6.7   | 8.2   |
| 5 j    | 61.4                       | 77.7  | 88.7  | 95.1  | 99.6  | 103.0 | 105.9 | 110.4 | 113.9 | 120.4 | 124.9 | 136.2 |
|        | 2.6                        | 3.2   | 3.8   | 4.2   | 4.5   | 4.7   | 5.0   | 5.3   | 5.7   | 6.3   | 6.8   | 8.1   |
| 7 j    | 70.5                       | 88.1  | 100.0 | 106.7 | 111.5 | 115.2 | 118.2 | 122.9 | 126.6 | 133.3 | 138.0 | 149.6 |
|        | 3.1                        | 3.7   | 4.2   | 4.6   | 4.9   | 5.1   | 5.3   | 5.7   | 5.9   | 6.5   | 6.9   | 8.1   |
| 10 j   | 83.7                       | 103.2 | 116.2 | 123.6 | 128.7 | 132.7 | 135.9 | 141.0 | 144.9 | 152.1 | 157.1 | 169.3 |
|        | 3.8                        | 4.7   | 5.4   | 5.8   | 6.2   | 6.4   | 6.7   | 7.0   | 7.4   | 8.0   | 8.4   | 9.7   |
| 15 j   | 101.3                      | 124.2 | 139.1 | 147.5 | 153.4 | 157.8 | 161.5 | 167.2 | 171.6 | 179.5 | 185.1 | 198.5 |
|        | 4.7                        | 5.7   | 6.4   | 6.7   | 7.0   | 7.2   | 7.4   | 7.7   | 7.9   | 8.3   | 8.7   | 9.5   |
| 20 j   | 118.0                      | 144.5 | 161.8 | 171.4 | 178.0 | 183.1 | 187.3 | 193.7 | 198.7 | 207.6 | 213.9 | 228.8 |
|        | 5.5                        | 6.8   | 7.7   | 8.1   | 8.5   | 8.8   | 9.0   | 9.4   | 9.7   | 10.2  | 10.7  | 11.8  |
| 25 j   | 125.4                      | 153.7 | 171.9 | 182.0 | 189.0 | 194.3 | 198.6 | 205.3 | 210.5 | 219.7 | 226.2 | 241.6 |
|        | 6.1                        | 7.6   | 8.7   | 9.4   | 9.9   | 10.4  | 10.7  | 11.3  | 11.8  | 12.7  | 13.4  | 15.2  |
| 30 j   | 147.0                      | 177.6 | 197.1 | 207.8 | 215.3 | 220.9 | 225.5 | 232.7 | 238.1 | 247.9 | 254.7 | 270.8 |
|        | 6.8                        | 8.4   | 9.8   | 10.6  | 11.3  | 11.9  | 12.3  | 13.1  | 13.8  | 15.0  | 15.9  | 18.4  |

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                        | 10.2  | 12.3  | 13.5  | 14.3  | 15.0  | 15.5  | 16.4  | 17.0  | 18.2  | 19.1  | 21.1  |
|        | 7.9                        | 11.5  | 14.3  | 16.1  | 17.5  | 18.6  | 19.5  | 21.0  | 22.3  | 24.7  | 26.6  | 31.5  |
| 20 min | 10.2                       | 14.5  | 17.5  | 19.3  | 20.6  | 21.5  | 22.3  | 23.6  | 24.5  | 26.3  | 27.6  | 30.6  |
|        | 11.4                       | 16.5  | 20.4  | 22.9  | 24.8  | 26.4  | 27.7  | 29.8  | 31.5  | 34.9  | 37.4  | 44.1  |
| 30 min | 12.0                       | 17.4  | 21.2  | 23.5  | 25.1  | 26.4  | 27.4  | 29.1  | 30.4  | 32.9  | 34.6  | 39.0  |
|        | 13.5                       | 19.7  | 24.6  | 27.6  | 29.8  | 31.6  | 33.2  | 35.7  | 37.7  | 41.5  | 44.4  | 52.0  |
| 1 h    | 15.0                       | 20.7  | 24.8  | 27.1  | 28.8  | 30.0  | 31.1  | 32.8  | 34.1  | 36.4  | 38.1  | 42.2  |
|        | 16.7                       | 23.5  | 28.9  | 32.2  | 34.7  | 36.7  | 38.5  | 41.3  | 43.6  | 47.9  | 51.3  | 60.0  |
| 2 h    | 17.9                       | 24.4  | 28.9  | 31.6  | 33.4  | 34.9  | 36.1  | 37.9  | 39.4  | 42.0  | 43.9  | 48.4  |
|        | 20.0                       | 27.7  | 33.7  | 37.4  | 40.2  | 42.5  | 44.4  | 47.6  | 50.1  | 55.0  | 58.7  | 68.4  |
| 3 h    | 19.8                       | 27.1  | 32.2  | 35.2  | 37.4  | 39.1  | 40.4  | 42.6  | 44.3  | 47.5  | 49.7  | 55.2  |
|        | 22.2                       | 30.7  | 37.2  | 41.3  | 44.3  | 46.8  | 48.8  | 52.2  | 54.9  | 60.1  | 64.0  | 74.2  |
| 6 h    | 23.9                       | 31.6  | 36.9  | 39.9  | 42.1  | 43.7  | 45.0  | 47.1  | 48.7  | 51.5  | 53.5  | 58.3  |
|        | 26.8                       | 35.6  | 42.4  | 46.8  | 50.0  | 52.7  | 54.9  | 58.6  | 61.6  | 67.4  | 71.7  | 83.2  |
| 12 h   | 28.8                       | 38.0  | 44.3  | 47.8  | 50.3  | 52.2  | 53.7  | 56.1  | 58.0  | 61.2  | 63.5  | 68.8  |
|        | 32.8                       | 43.4  | 51.7  | 56.9  | 60.9  | 64.1  | 66.8  | 71.3  | 74.9  | 81.9  | 87.2  | 101.1 |
| 1 j    | 35.4                       | 46.2  | 53.7  | 58.1  | 61.1  | 63.5  | 65.5  | 68.6  | 71.0  | 75.5  | 78.6  | 86.4  |
|        | 39.6                       | 51.6  | 60.4  | 65.8  | 69.8  | 72.9  | 75.5  | 79.8  | 83.2  | 89.7  | 94.4  | 106.6 |
| 2 j    | 44.0                       | 56.3  | 64.4  | 68.9  | 72.1  | 74.5  | 76.4  | 79.5  | 81.8  | 86.0  | 89.0  | 95.9  |
|        | 50.3                       | 65.0  | 75.8  | 82.3  | 87.1  | 90.9  | 94.1  | 99.2  | 103.3 | 110.9 | 116.6 | 130.9 |
| 3 j    | 46.1                       | 59.0  | 67.4  | 72.1  | 75.3  | 77.8  | 79.8  | 82.9  | 85.3  | 89.6  | 92.7  | 99.8  |
|        | 53.8                       | 69.4  | 80.6  | 87.4  | 92.3  | 96.2  | 99.4  | 104.5 | 108.6 | 116.3 | 121.8 | 135.9 |
| 4 j    | 49.7                       | 63.7  | 72.9  | 78.0  | 81.6  | 84.3  | 86.6  | 90.0  | 92.7  | 97.5  | 100.8 | 108.7 |
|        | 58.5                       | 74.9  | 86.4  | 93.2  | 98.1  | 101.9 | 105.1 | 110.2 | 114.3 | 121.8 | 127.2 | 140.9 |
| 5 j    | 56.4                       | 71.4  | 81.3  | 86.9  | 90.8  | 93.8  | 96.2  | 99.9  | 102.8 | 108.0 | 111.6 | 120.2 |
|        | 66.5                       | 84.0  | 96.1  | 103.3 | 108.3 | 112.3 | 115.6 | 120.9 | 125.0 | 132.7 | 138.3 | 152.1 |
| 7 j    | 64.5                       | 80.9  | 91.7  | 97.7  | 101.9 | 105.1 | 107.8 | 111.8 | 114.9 | 120.6 | 124.5 | 133.7 |
|        | 76.5                       | 95.4  | 108.3 | 115.7 | 121.0 | 125.2 | 128.6 | 134.0 | 138.2 | 146.0 | 151.6 | 165.4 |
| 10 j   | 76.3                       | 94.0  | 105.7 | 112.1 | 116.7 | 120.1 | 122.9 | 127.2 | 130.5 | 136.5 | 140.6 | 150.3 |
|        | 91.1                       | 112.5 | 126.8 | 135.0 | 140.8 | 145.3 | 149.0 | 154.8 | 159.3 | 167.7 | 173.6 | 188.2 |
| 15 j   | 92.2                       | 113.0 | 126.7 | 134.3 | 139.6 | 143.7 | 147.0 | 152.1 | 156.1 | 163.2 | 168.2 | 180.0 |
|        | 110.4                      | 135.3 | 151.6 | 160.7 | 167.1 | 172.0 | 176.0 | 182.3 | 187.1 | 195.9 | 202.1 | 217.1 |
| 20 j   | 107.1                      | 131.2 | 146.8 | 155.4 | 161.4 | 165.9 | 169.6 | 175.4 | 179.7 | 187.6 | 193.0 | 205.7 |
|        | 128.8                      | 157.9 | 176.8 | 187.3 | 194.7 | 200.3 | 204.9 | 212.1 | 217.6 | 227.7 | 234.8 | 251.8 |
| 25 j   | 113.3                      | 138.7 | 154.8 | 163.5 | 169.5 | 174.0 | 177.6 | 183.2 | 187.4 | 194.9 | 200.0 | 211.8 |
|        | 137.4                      | 168.6 | 189.0 | 200.4 | 208.4 | 214.6 | 219.6 | 227.5 | 233.6 | 244.6 | 252.5 | 271.4 |
| 30 j   | 133.7                      | 161.0 | 177.9 | 187.0 | 193.1 | 197.7 | 201.3 | 206.9 | 211.1 | 218.5 | 223.5 | 234.8 |
|        | 160.4                      | 194.1 | 216.2 | 228.7 | 237.5 | 244.2 | 249.7 | 258.4 | 265.1 | 277.3 | 285.9 | 306.8 |

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                          | 133.1 | 0.4694 | 302.1  | 0.7240 | 53.5  | 0.5250 |
| 5                          | 191.7 | 0.4710 | 465.4  | 0.7466 | 82.0  | 0.5470 |
| 10                         | 234.2 | 0.4691 | 596.2  | 0.7595 | 107.6 | 0.5627 |
| 15                         | 259.5 | 0.4674 | 679.2  | 0.7662 | 125.1 | 0.5717 |
| 20                         | 277.9 | 0.4660 | 741.6  | 0.7708 | 138.8 | 0.5782 |
| 25                         | 292.5 | 0.4647 | 792.3  | 0.7743 | 150.2 | 0.5832 |
| 30                         | 304.5 | 0.4637 | 835.2  | 0.7771 | 160.2 | 0.5873 |
| 40                         | 323.9 | 0.4619 | 906.0  | 0.7814 | 177.0 | 0.5937 |
| 50                         | 339.3 | 0.4604 | 963.6  | 0.7847 | 191.1 | 0.5988 |
| 75                         | 368.0 | 0.4576 | 1074.7 | 0.7906 | 219.3 | 0.6079 |
| 100                        | 389.0 | 0.4555 | 1159.0 | 0.7947 | 241.5 | 0.6145 |
| 200                        | 441.9 | 0.4501 | 1382.4 | 0.8045 | 303.8 | 0.6303 |

## Références

Van de Vyver, H. (2012). Spatial regression models for extreme precipitation in Belgium, *Water Resour. Res.*, 48, W09549, doi :10.1029/2011WR011707.

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