

# European Nitrogen Assessment

## Chapter 6: Nitrogen processes in terrestrial ecosystems

Supplementary Material: Nitrogen stocks and fluxes for different ecosystem types at selected sites across Europe.

Authors: Gundersen, P.G. & Butterbach-Bahl, K.

|                              | Site characteristics  |                   |                    | Plant biomass |               | MB                           | Soil                       |                       | Inputs                    |              |                | Internal N turnover |               |                |                     | Outputs                  |                        |                  |                        |       |                  | References/Remarks |  |   |
|------------------------------|-----------------------|-------------------|--------------------|---------------|---------------|------------------------------|----------------------------|-----------------------|---------------------------|--------------|----------------|---------------------|---------------|----------------|---------------------|--------------------------|------------------------|------------------|------------------------|-------|------------------|--------------------|--|---|
|                              | Coordi-nates          | Mean Annual Temp. | Mean Annual Rainf. | Aboveground-N | Belowground-N | Microb. Bio-mass-N (0-10 cm) | Organic matter-N (0-1.0 m) | Inorganic N (0-1.0 m) | Atm. N depos. (dry + wet) | Fertiliser N | Plant N uptake | Plant litter prod.  | Plant increm. | Mineralisation | Gross-Nitrification | Harvest (N)              | NO <sub>3</sub> leach. | DON leach        | NH <sub>3</sub> volat. | NO    | N <sub>2</sub> O |                    | N <sub>2</sub>   |   |
|                              | [°C]                  | [mm]              |                    |               |               |                              |                            |                       |                           |              |                |                     |               |                |                     | [kg N ha <sup>-1</sup> ] |                        |                  |                        |       |                  |                    |  |   |
| <i>Forests</i>               |                       |                   |                    |               |               |                              |                            |                       |                           |              |                |                     |               |                |                     |                          |                        |                  |                        |       |                  |                    |  |   |
| Hyytiälä                     | 61°51'N<br>24°17'E    | 2.9               | 709                | 208           | 1600          | 46                           | 1350                       | 1.1                   | -                         | 5            | 0              | 23                  | 26*           | 6.8            |                     | 0                        | 0.04                   | 0.5              |                        | 0.00  | 0.3              | -                  | 18<br>*above ground tree litter<br>0-0.1 m = humus + 0-0.1 m in mineral soil |   |
| Soroe Beech                  | 55°29'N<br>11°38'E    | 8.3               | 730                |               |               |                              | 8864*                      |                       |                           | 27           | 0              | 114                 | 100           | 14             | 657                 | 292                      | 0                      | 0.13             | 0.6                    | -     | 0.23             | 1.2                | -  | *0-0.6 m without litter layer<br>13, 14   |
| Höglwald spruce              | 11°11'E<br>48°30'N    | 7.6               | 850                | 1141          | 208           | 40                           | 9000                       | 20-60                 | 2-5                       | 25+15        | 0              | 85-95               | 75-85         | 10             | 900                 | 550                      | 0                      | 21               | 0                      | 0     | 7                | 1.5                | 7  | 1,2,3,4,5,6,  |
| Achenkirch mixed             | 11°38'E<br>47°34'N    | 6.5               | 1733               | 572           | -             | NA                           | NA                         | 11                    | -                         | 12           | 0              | -                   | -             | -              | NA                  | NA                       | -                      | -                | -                      | -     | 0.03             | 0.6                | 2.2  |   |
| Klausenleopoldsdorf beech    | 16°02'54"E<br>48°07'N | 8                 | 728                | -             | -             | ?                            | ?                          | ?                     | -                         | 13           | 0              | -                   | -             | -              | ?                   | ?                        | -                      | ?                | ?                      | -     | 0.02             | 0.2                | ?  |   |
| <i>Shrubland / heathland</i> |                       |                   |                    |               |               |                              |                            |                       |                           |              |                |                     |               |                |                     |                          |                        |                  |                        |       |                  |                    |  |   |
| Heathland (Brandbjerg - DK)  | 11°58'E<br>55°53'N    | 8                 | 613                | 130           | 50            | 50*                          | 4450                       | 7*                    | nd                        | 14**         | 0              | 49                  | 39            | 10             | 80<br>+65***        | NA                       | 0                      | 2.2 +<br>0.3**** | 1.1                    | NA    | NA               | 0.4                | NA   | 15, 16, 17<br><br>*top 30 cm, **bulk deposition,<br>***mineralisation + immobilisation,<br>****NO <sub>3</sub> +NH <sub>4</sub> |
| <i>Grassland</i>             |                       |                   |                    |               |               |                              |                            |                       |                           |              |                |                     |               |                |                     |                          |                        |                  |                        |       |                  |                    |  |   |
| Crichton                     | 3°33'E<br>55°02'N     | 8.5               | 1023               | 4000          | 4000          | -                            | 1200                       | 20-200                | 0                         | 10           | 10             | -                   | -             | 0              | -                   | -                        | 180**                  | 100**            | -                      | 4.5** |                  | 19.3               | 39**   | **estimated; 7,8,9  |

|  |                         |      |     |       |      |       |        |        |    |       |     |              |             |              |       |      |            |    |    |      |    |     |      |   |
|--|-------------------------|------|-----|-------|------|-------|--------|--------|----|-------|-----|--------------|-------------|--------------|-------|------|------------|----|----|------|----|-----|------|---|
| Paulinen-<br>aue (fen<br>peat)                       | 12°43' E<br>52°41'<br>N | 8.6  | 550 | NA    | NA   | 280   | 66300  | 26-120 | NA | 5     | 160 | 177.5        | NA          | NA           | 8295  | 2457 | 177.5      | 5  | NA | NA   | NA | 7.8 | 42.9 |   |
| <i>Arable</i>  |                         |      |     |       |      |       |        |        |    |       |     |              |             |              |       |      |            |    |    |      |    |     |      |   |
| Winter<br>wheat                                      | 0°22'E<br>51°48'N       | 9.1  | 686 | 13980 | 6990 | 1300  | 8000   | 18.9   | 0  | 17    | 224 | 204          | 0           | 0            | -     | -    |            |    |    |      |    |     | 2.2  | 10,11   |
| Oilseed<br>rape                                      | 0°22'E<br>51°48'N       | 9.1  | 686 | 11820 | 5910 | 1300  | 8000   | 10.0*  | 0  | 17    | 237 | 199          | 0           | 0            | -     | -    |            |    |    |      |    |     | 2.4  | *Prior to fertiliser<br>application; 10, 11                     |
| Oats   | 2°16'E<br>57°10'N       | 8.1  | 933 | 8700  | 4350 |       | 180000 | 15     | 25 | 15    | 30  | 88           | 0           | 0            | -     | -    | 88         | 30 |    |      |    |     | 2.9  | 12  |
| Rafidin<br>Oilseed<br>rape,<br>control               | 02°15'E<br>48°50'N      | 10.0 | 618 | 84*   | 5*   | 368** | 5000** | 5-50** | 0  | NA+12 | 0   | 121          | 37          | 84           | 39*** | NA   | 63***      | 28 | NA | NA   | NA | <1  | <1   | *at harvest, **top 30 cm<br>of soil, ***net N<br>mineralisation |
| Rafidin<br>Oilseed<br>rape, N1                       | 02°15'E<br>48°50'N      | 10.0 | 618 | 135*  | 5*   | 368** | 5000** | 5-60** | 0  | NA+12 | 135 | 138          | 63          | 75           | 20*** | NA   | 101***     | 32 | NA | NA   | NA | <1  | <1   | *at harvest, **top 30 cm<br>of soil, ***net N<br>mineralisation |
| Rafidin<br>Oilseed<br>rape, N2                       | 02°15'E<br>48°50'N      | 10.0 | 618 | 240*  | 8*   | 368** | 5000** | 5-80** | 0  | NA+12 | 273 | 354          | 119         | 235          | 73*** | NA   | 156***     | 40 | NA | 21   | 1  | <1  | 1    | *at harvest, **top 30 cm<br>of soil, ***net N<br>mineralisation |
| Maulde<br>Reduced<br>till<br>Wheat<br>Year<br>(2007) | 50°37'N<br>3°34'E       | 11.4 | 744 | 175   | 6    | NA    | 1600   | 1-100  | 0  | 40    | 170 | 123<br>Grain | 52<br>Straw | 17<br>Resid. | 110*  | NA   | 123+5<br>2 | NA | NA | 25** | NA | 3.8 | NA   | *net mineralisation,<br>**IPCC default                          |

NA: not available; ND: not detected

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