

CL exceedances for N and S using (almost?) final baseline scenarios: Exceeded area *or* AAE?

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(Baseline-) Emission Scenarios 2020

... as of Friday last week

Total European emissions (incl. shipping):

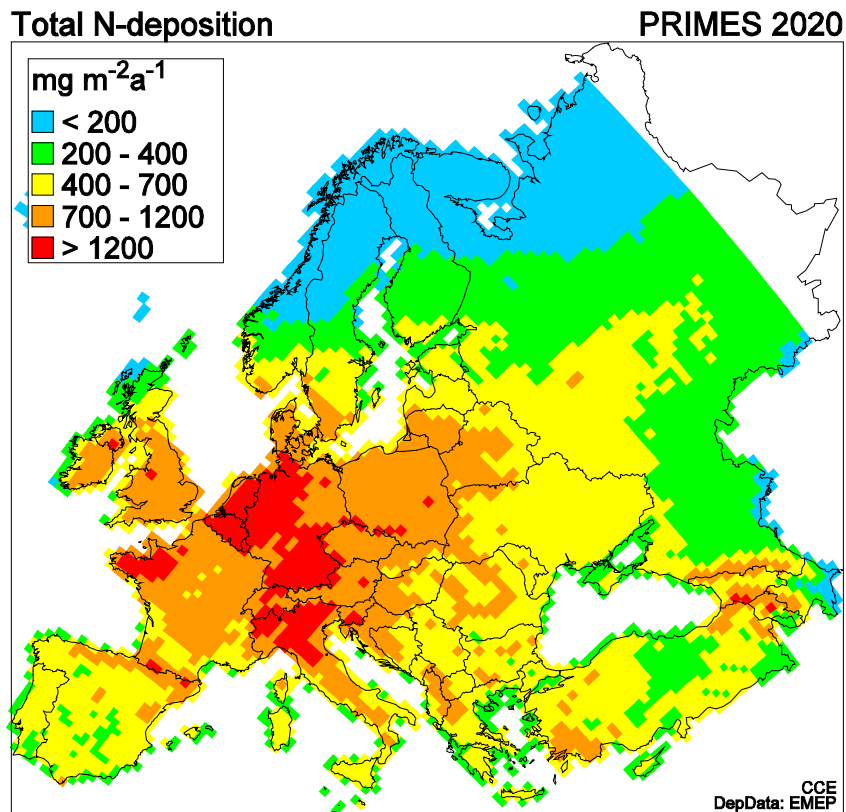
| Scenario | kt SO _x -S | kt NO _x -N | kt NH _y -N |
|------------------|-----------------------|-----------------------|-----------------------|
| PRIMES | 6986 | 4472 | 5014 |
| NATional figures | 7126 | 4581 | 5079 |
| MFR | 3321 | 2391 | 3091 |

(1) NAT > PRIMES

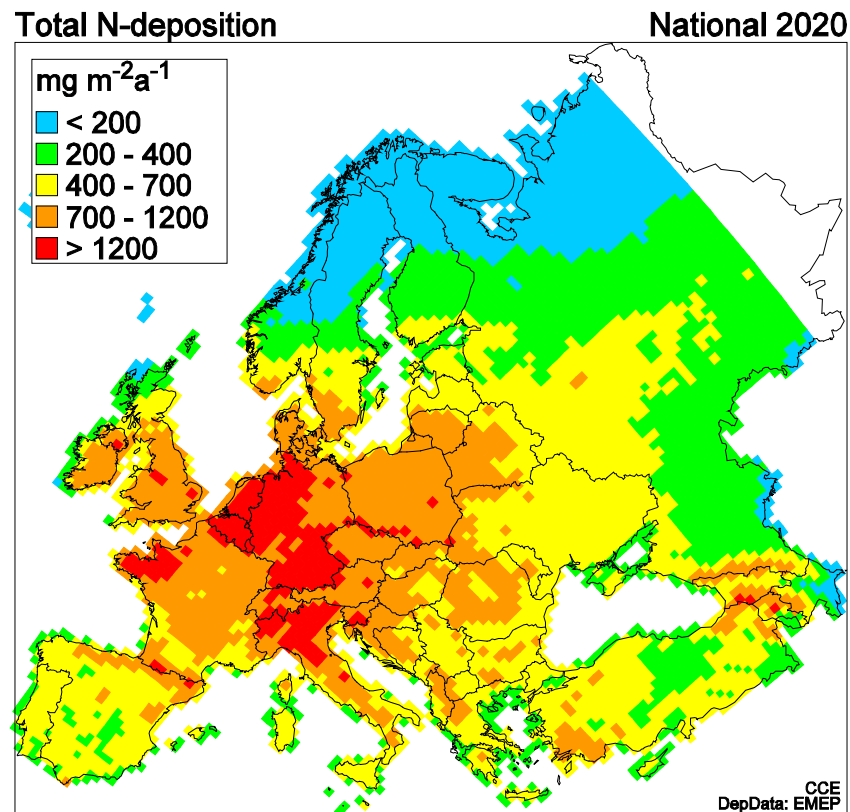
(2) NH_y > NO_x and total N > S

Total N Deposition (1)

PRIMES



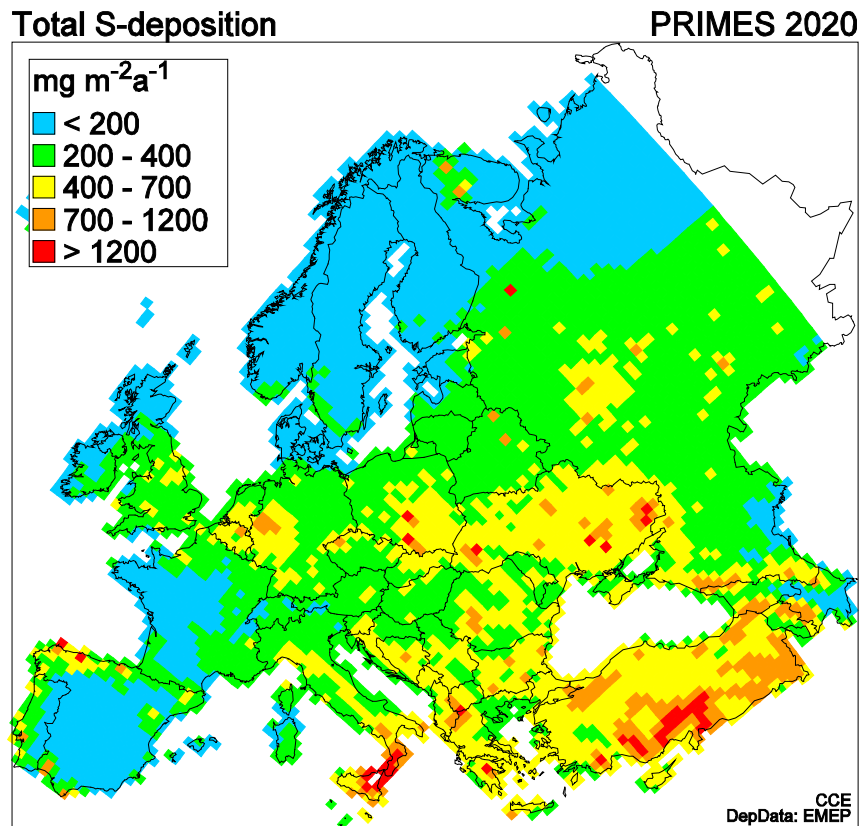
NAT



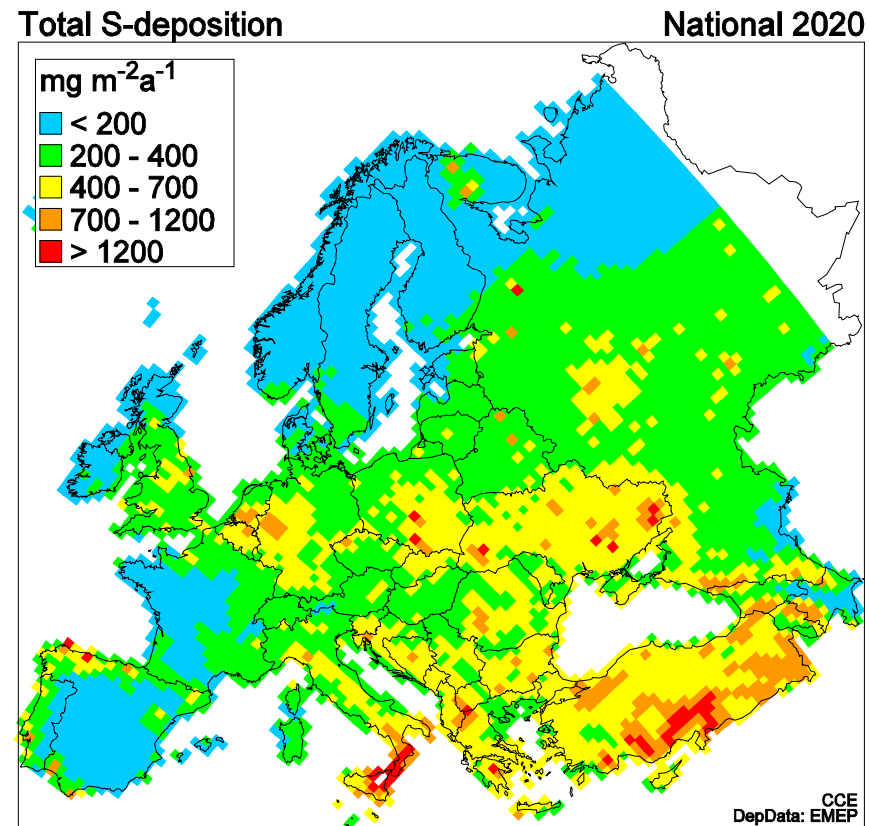
Spot the difference!

Total S Deposition (1)

PRIMES

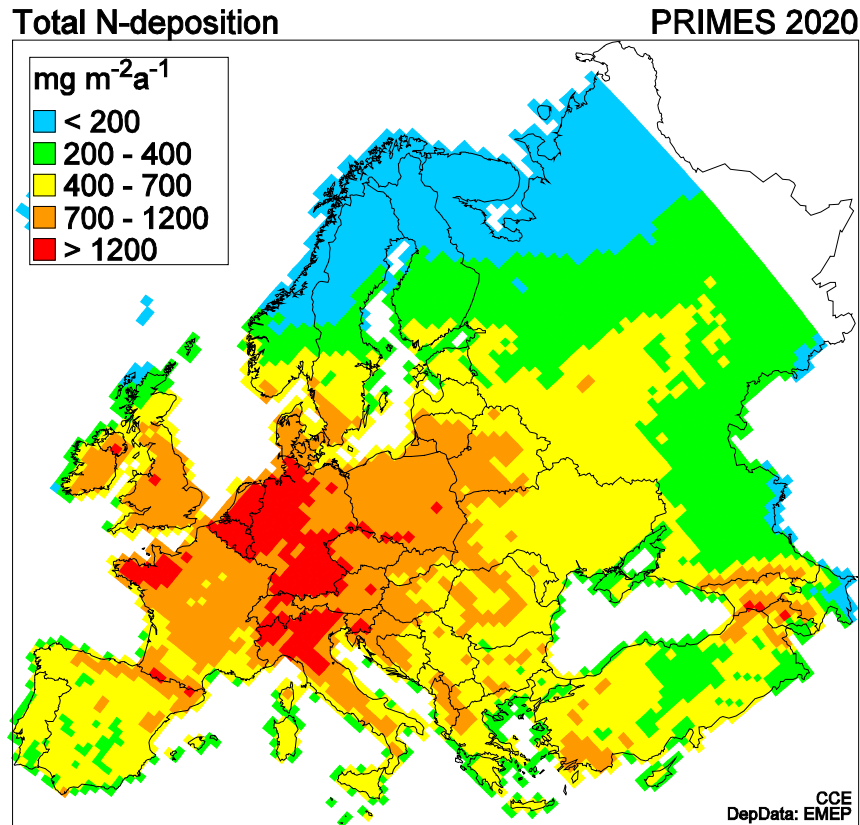


NAT

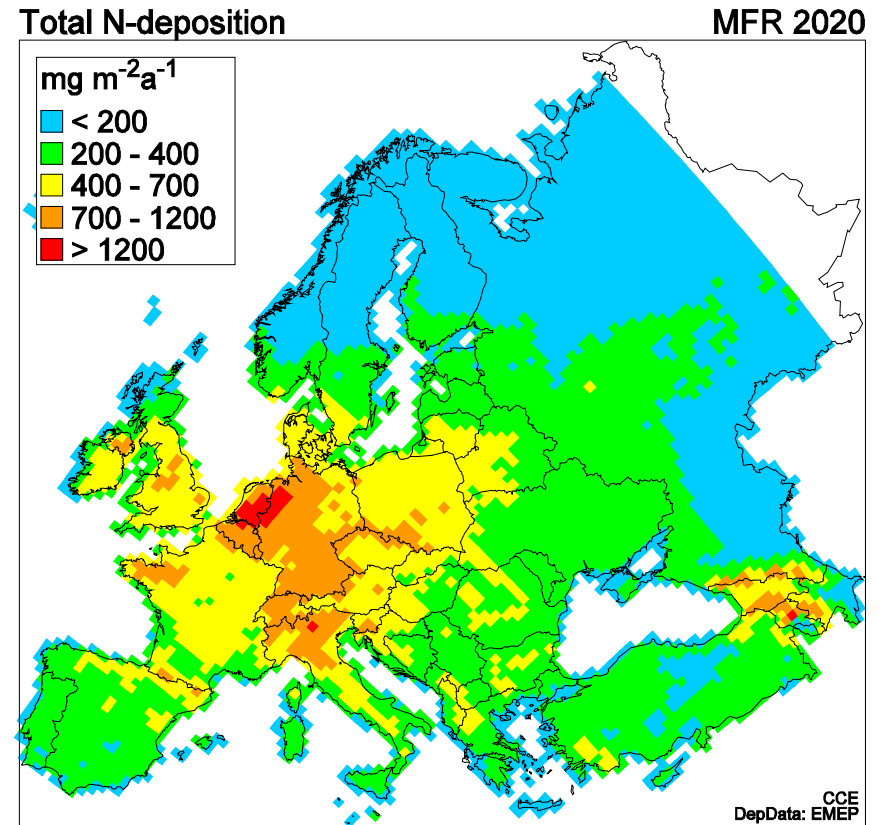


Total N Deposition (2)

PRIMES

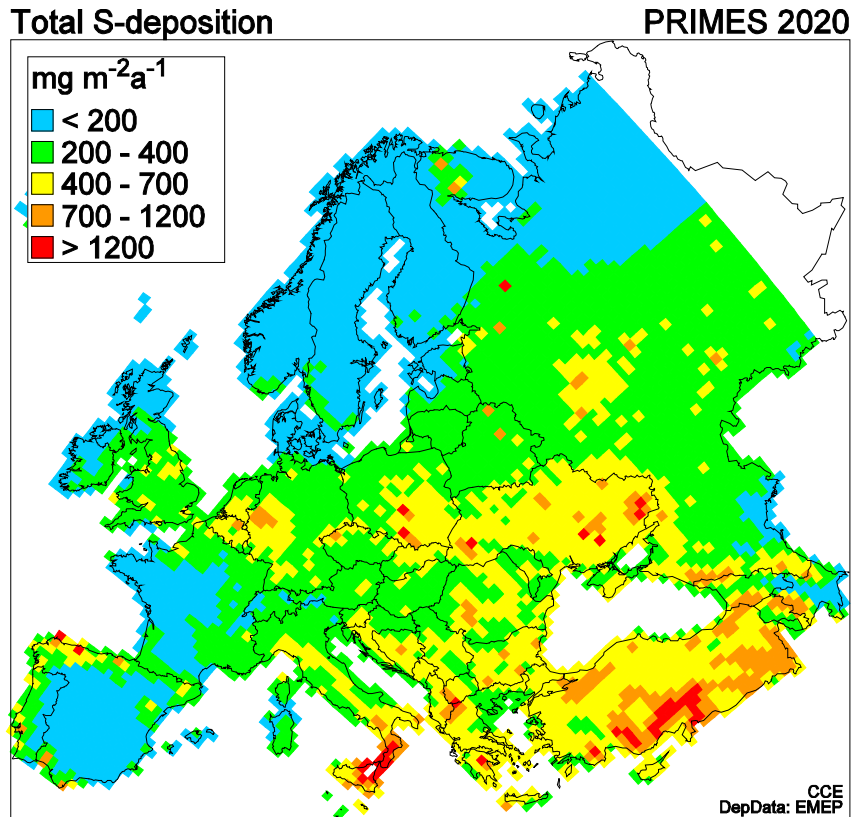


MFR

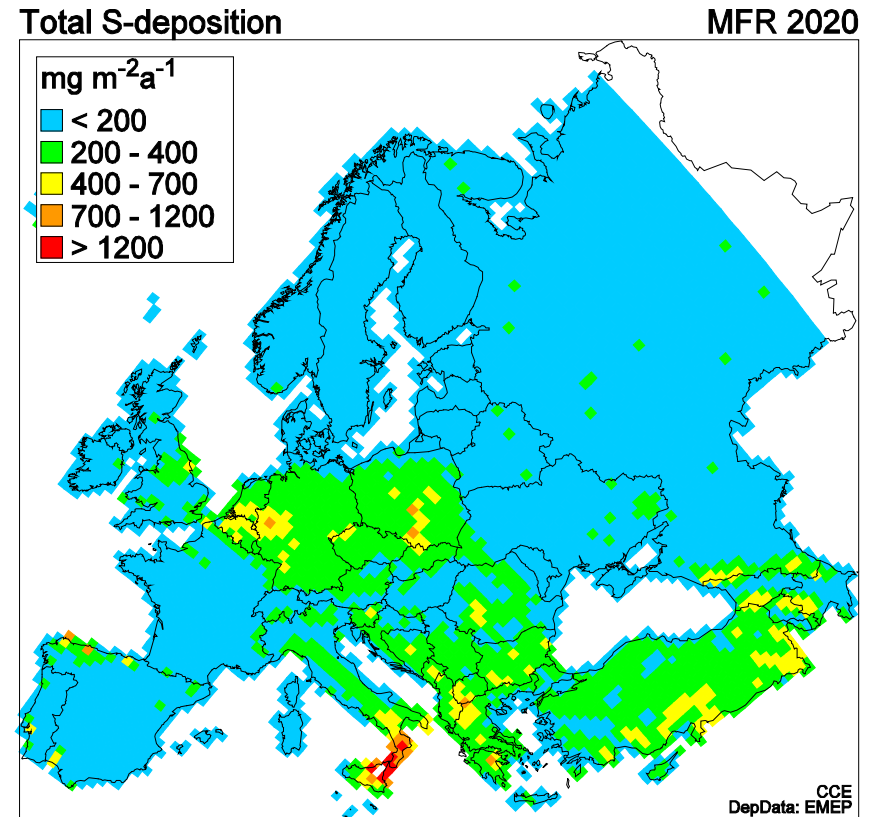


Total S Deposition (2)

PRIMES



MFR



Calculating exceedances

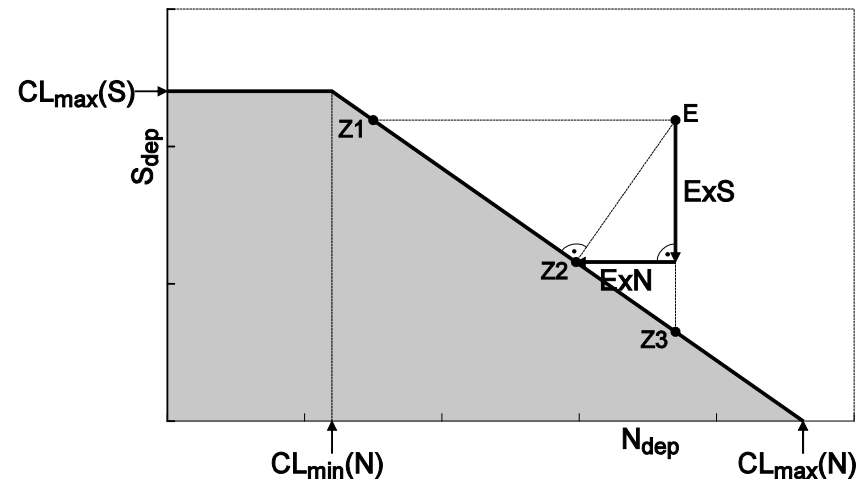
Single ecosystem:

Critical Load of nutrient N:

$$Ex = \max\{N_{dep} - CL_{nut}(N), 0\}$$

Critical Load of acidity:

$$Ex = ExN + ExS$$



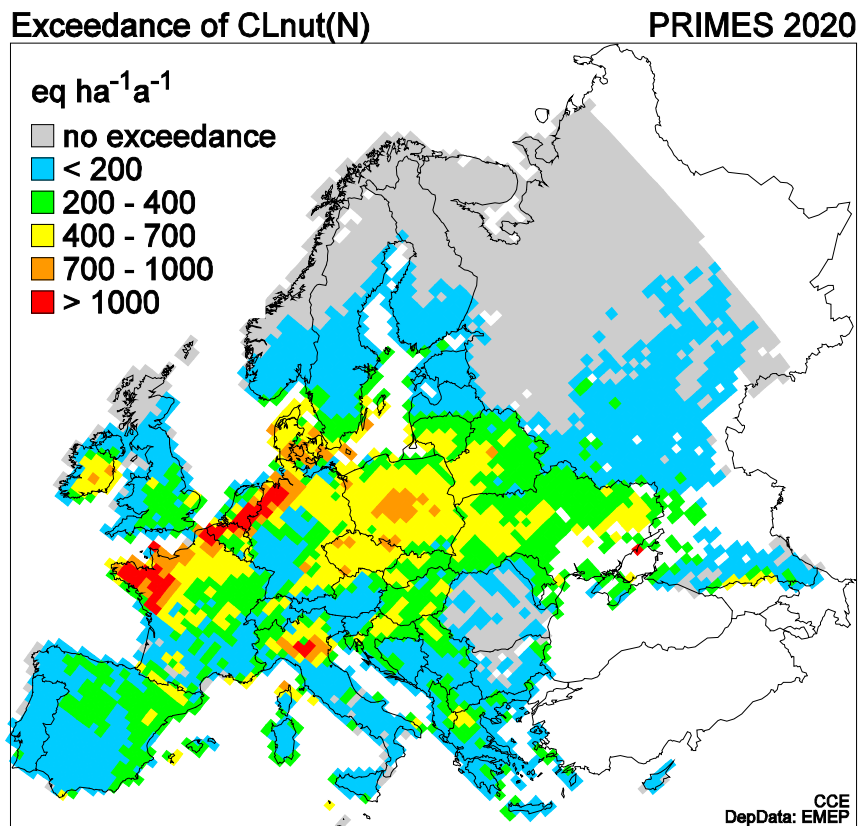
Many ecosystems:

$$AAE = \frac{A_1 \cdot Ex_1 + A_2 \cdot Ex_2 + \dots + A_n \cdot Ex_n}{A_1 + A_2 + \dots + A_n}$$

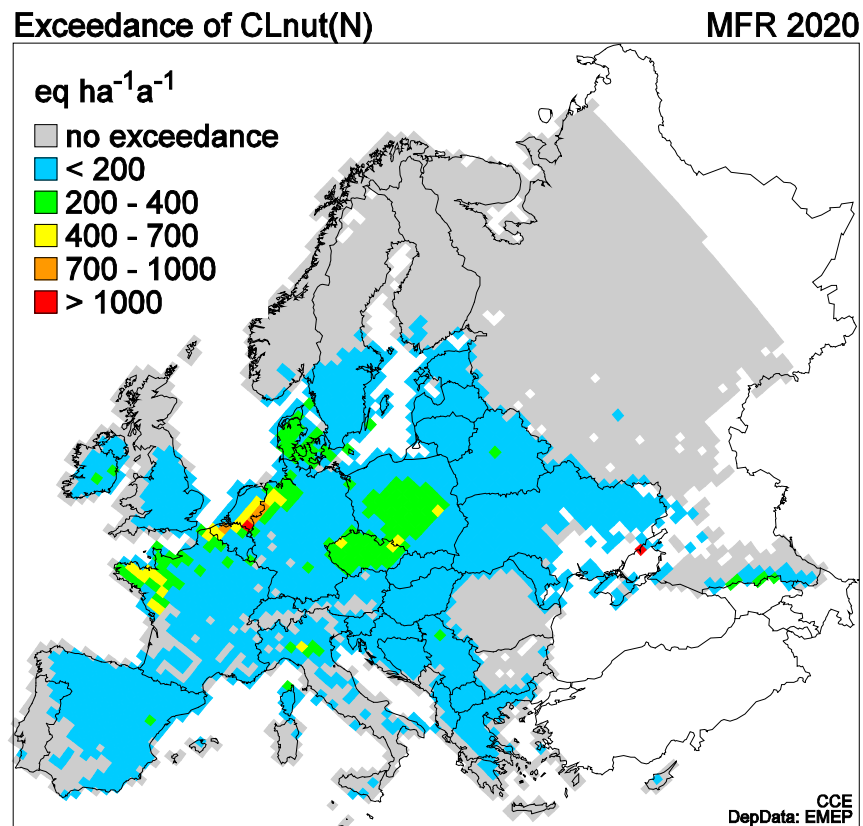
Area exceeded if $Ex > 0$;

Exceedance (AAE) of CLnut(N) [eq/ha/yr]

PRIMES

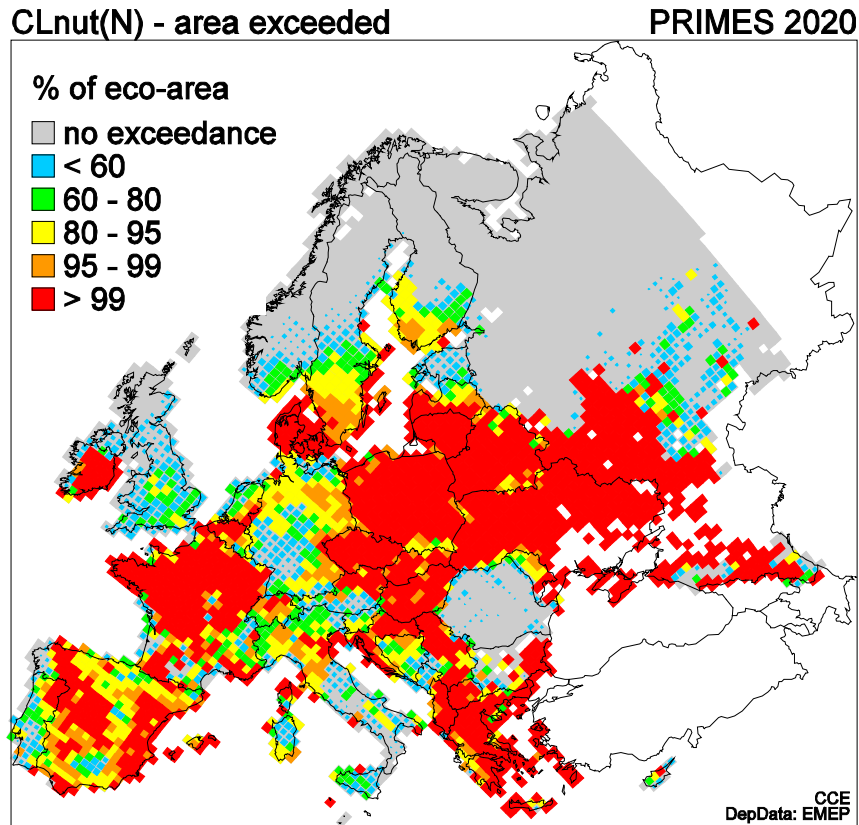


MFR

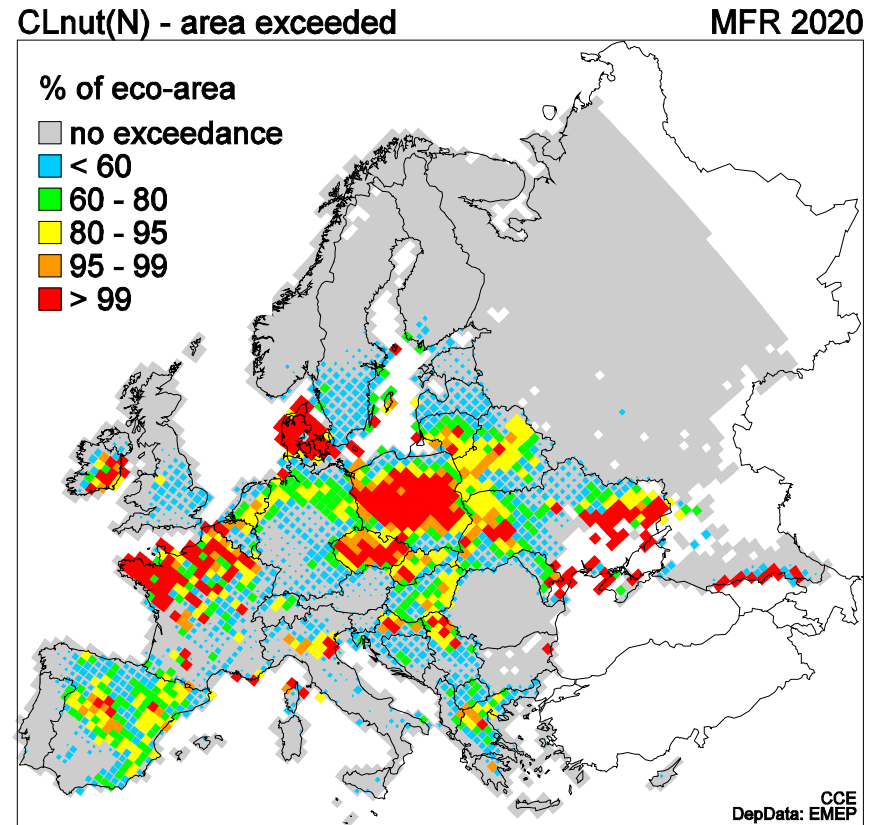


Exceeded ecosystem area of CLnut(N) [%]

PRIMES



MFR



Summary: Exceedance (AAE) and exceeded area in 2020

Exceedance (**AAE**) (eq/ha/yr):

| Scenario | Nutrient N | | Acidity | |
|----------|------------|--------|---------|-------|
| | Europe | EU27 | Europe | EU27 |
| PRIMES | 97.11 | 170.93 | 10.39 | 20.28 |
| NAT | 101.00 | 178.98 | 12.07 | 23.70 |
| MFR | 18.11 | 34.76 | 1.92 | 4.06 |

Ecosystem **Area** exceeded (% of total):

| Scenario | Nutrient N | | Acidity | |
|----------|------------|-------|---------|------|
| | Europe | EU27 | Europe | EU27 |
| PRIMES | 37.02 | 58.90 | 3.62 | 6.15 |
| NAT | 38.21 | 61.08 | 3.93 | 6.74 |
| MFR | 13.85 | 23.95 | 1.04 | 1.99 |

Conclusions

- Both AAE and exceeded area should be used in IA
- For N and acidity CLs “ex-post” analysis can be carried out quickly by CCE; since deposition calcs can be done in-house
- However, this is not the case for other assessments, e.g. Ozone flux calculations, Corrosion etc. ...
- These need model runs by EMEP MSC-W; can only be done sporadically!

Thus plea by effects-community:

TFIAM may freeze (at least) one of the Baseline scenarios!