Call for Data 2024-25: Instructions

Version 18 July 2024

Coordination Centre for Effects (CCE)

1. Introduction

At the 40th ICP Modelling and Mapping Taskforce meeting and 31st CCE Workshop, (Oslo, 23-25 April 2024) the Coordination Centre for Effects (CCE) was requested to issue a Call for Data (CfD) in 2024 with a deadline in early 2025. The results of this CfD will be integrated in the European critical load dataset which will support the CLTRAP in the process of the revision of the Gothenburg protocol. As decided at this meeting as well, the final deadline is set at 31 March 2025. This document provides the basic instructions for responding to this call for data 2024-25, which asks for (updated) critical loads for acidification (Steady-State/Simple Mass Balance model) and eutrophication ($CL_{nut}N$ from Simple Mass Balance and/or $CL_{emp}N$) for terrestrial and/or aquatic ecosystems.

Please note:
Please indicate as early as possible if you are planning to deliver data within this call. You can also choose to confirm the data you sent for the previous call (2019-21) via a written statement and without resubmitting any data. Please be aware that any early indication of your choice will help us to organize our workplan much more efficient.
Please use the latest database template (from the previous call 2019-21) or plain text files (e.g. *.csv) for submitting your critical loads. Also comply with the specifications for the table structure, table naming as well as the naming specifications and specified units for the parameters.

2. Documentation and other general information

The documentation should substantiate and justify sources and methods applied in response to this call, but should be focussed to the data sources and deviations from the Mapping Manual (CLRTAP, 2023).
To facilitate the integration into the European database at the CCE, you should use the Access database template developed by the CCE. This template is described in Section 5 and can be downloaded from the CCE website (https://www.umweltbundesamt.de/en/call-for-data). Comma-delimited text files will also be accepted, if the column headers are identical to the variable names of section 5.
If you are planning to submit data please send an E-Mail to cce@uba.de. We will then contact you in order to establish the data exchange, if this is needed.

3. Types of Critical Loads and how to submit them

For the data submission we now distinguish two types of critical loads (variable names are also used in the Tables in Section 5):
(1) Critical loads of acidity (CL_{acid}): For terrestrial ecosystem CL_{acid} is characterized by a Critical Load Function (CLF) of S and N (see page 176 Figure 5.3 in the Mapping Manual, CLRTAP 2023) and is quantified by $CL_{max}S$, $CL_{min}N$ and $CL_{max}N$, and generally computed by the SMB model. The CL_{acid} for freshwater ecosystems is characterized by a single term (see page 198 in the Mapping Manual).

(2) Critical loads of eutrophication (CL_{eut}): CL_{eut} is usually calculated only for terrestrial ecosystems and in the context of Nitrogen deposition. The CL_{eut} can either be computed by the SMB model (formerly known as $CL_{nut}N$) or by an empirical CL (as summarised in Bobbink et al 2023) (formerly known as $CL_{emp}N$). In line with the definition of a critical load, if both a $CL_{nut}N$ and a $CL_{emp}N$ are determined for same ecosystem, the CL of eutrophication, denoted as CL_{eut}, is the minimum of both. And only CL_{eut} should be reported.

4. The grid system

To enable the CL data, you provide to be linked with the EMEP deposition grid, the spatial extent of a relevant ecosystem must lie entirely within a single EMEP grid cell. To be compatible with the different resolutions of the EMEP datasets, your data must be intersected with a uniform 0.10°×0.05° grid. This grid should start and end at a multiple of 0.1° (longitude) resp. 0.05° (latitude). This should ensure that the ecosystems described in your modelling (and possibly their partitioning) can actually only be located within a single deposition grid cell.

5. Access Database template

The tables in the database have different purposes and are listed below.

ecords General site data, such as coordinates.
CLacid, *CLeut* Critical loads, one table for each type, with its related Critical Limits.
SiteInfo General background data for the site.

Table 1. Attributes of the table '*ecords*'

Variable	Explanation	Note
SiteID	Unique(!) identifier of the site	1)
Lon	Longitude (decimal degrees)	2)
Lat	Latitude (decimal degrees)	2)
EcoArea	Area of the ecosystem within the grid cell (km^2)	3)
Nmethod	Method with which CL_{eut} of the site is derived: 2 – modelled nutrient nitrogen 4 – empirical nitrogen critical load 5 – integration of modelled and empirical method 8 – any other method	
Protection	0: No specific nature protection applies 1: Special Protection Area (SPA), Birds Directive applies 2: Special Area of Conservation (SAC), Habitats Directive applies 3: SPA *and* SAC (1 *and* 2) 4: SPA *or* SAC (1 *or* 2) [don't know which one(s)] 9: A national nature protection program applies (but *not* 1 to 4!) -1: protection status unknown	
EUNIScode	EUNIS code, max. 6 characters	4)

Notes on Table 1 (see last column):

1) Use integer values only (4-bytes)
2) The geographical coordinates of the site or a reference point of the polygon (sub-grid) of the receptor under consideration (in decimal degrees, i.e. 48.533 for 48º31', etc.);
3) Please only submit spurious records with an ecosystem area smaller than 0.5 ha, if it has relevance other than for exceedance calculations (e.g. Natura 2000 sites). Furthermore, make sure that the total ecosystem area does not exceed the size of the land area of your country in the respective grid cell;
4) You can find information on EUNIS at https://eunis.eea.europa.eu

Table 2. Attributes of the database-table '*CLacid*'

Variable	Explanation
SiteID	Identifier of the site (see *ecords* Table)
$CL_{max}S$	Maximum critical load of sulphur (eq ha^{-1} a^{-1})
$CL_{min}N$	Minimum critical load of nitrogen (eq ha^{-1} a^{-1})
$CL_{max}N$	Maximum critical load of nitrogen (eq ha^{-1} a^{-1})
Crittype	Chemical criterion used for acidity CL calculations: =1: molar [Al]:[Bc]; =2: [Al] (eq m^{-3}); =3: base sat.(-); =4: pH; =5: [ANC] (eq m^{-3}); =6: molar[Bc]:[H]; =7: molar [Bc]:[Al]; =8: molar [Ca]:[Al]; =11: molar [Al]:[Bc] AND [Al]>0.1meq/L; = –1: other
Critvalue	Critical value for the chemical criterion given in 'Crittype'

Table 3. Attributes of the database-table '*CLeut*'

Variable	Explanation
SiteID	Identifier of the site (see *ecords* Table)
CL_{eut}	Critical load of eutrophication (eq ha^{-1} a^{-1})
cNacc	Acceptable (critical) N concentration if $CL_{nut}N$ calculation (meq m^{-3}) only if $CL_{eut} = CL_{nut}N$! (otherwise, if $CL_{emp}N$ is used, set to –1)

Table 4. Attributes of the database-table '*SiteInfo*'

Variable	Explanation
SiteID	Identifier of the site (see *ecords* Table)
thick	Thickness (root zone!) of the soil (m)
nANCcrit	The quantity $-ANC_{le(crit)}$ (eq ha^{-1} a^{-1})
Cadep	Total deposition of calcium (eq ha^{-1} a^{-1})
Mgdep	Total deposition of magnesium (eq ha^{-1} a^{-1})
Kdep	Total deposition of potassium (eq ha^{-1} a^{-1})
Nadep	Total deposition of sodium (eq ha^{-1} a^{-1})
Cldep	Total deposition of chloride (eq ha^{-1} a^{-1})
Cawe	Weathering of calcium (eq ha^{-1} a^{-1})
Mgwe	Weathering of magnesium (eq ha^{-1} a^{-1})
Kwe	Weathering of potassium (eq ha^{-1} a^{-1})
Nawe	Weathering of sodium (eq ha^{-1} a^{-1})
Caupt	Net growth uptake of calcium (eq ha^{-1} a^{-1})
Mgupt	Net growth uptake of magnesium (eq ha^{-1} a^{-1})
Kupt	Net growth uptake of potassium (eq ha^{-1} a^{-1})
Qle	Amount of water leaving at the bottom of the root zone (mm a^{-1})
lgKAlox	Equilibrium constant for the Al-H relationship (log10) (formerly known as K_{gibb})
expAl	Exponent for the Al-H relationship (=3 for gibbsite equilibrium)
cOrgacids	Total concentration of organic acids (m*DOC) (eq m^{-3})
Nimacc	Acceptable nitrogen immobilised in the soil (eq ha^{-1} a^{-1})
Nupt	Net growth uptake of nitrogen (eq ha^{-1} a^{-1})
fde	Denitrification fraction (0≤fde<1) (-)
Nde	Amount of nitrogen denitrified (eq ha^{-1} a^{-1})
Prec	Annual precipitation (mm a^{-1})
TempC	Annual average temperature (°C)
CNrat	C/N ratio in the topsoil (g g^{-1})
Measured	On-site measurements included in the data for CL calculations: 0: No measurements, 1: ICP Forest, 2: ICP Waters, 4: ICP Integrated Monitoring, 8: ICP Vegetation, 16: Other measurement programme. (if more than one of the listed possibilities applies, add the numbers!)

References

Bobbink R, Loran Ch, Tomassen H (eds.), 2022. Review and revision of empirical critical loads of nitrogen for Europe. Final Report, CCE, Dessau-Roßlau, Germany. URL: https://www.umweltbundesamt.de/en/publikationen/review-revision-of-empirical-critical-loads-of

CLRTAP, 2023. Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends, Umweltbundesamt, Dessau-Roßlau, Germany. URL: https://www.umweltbundesamt.de/en/publikationen/manual-on-methodologies-criteria-for-modelling-0