Italy

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Introduction
The *updating* and renewing of the critical load database by considering the need to adapt it to the change of the EMEP grid from 5x5km cells into the new 0.1° x 0.05° longitude-latitude grid have been the work of this year.
All parameters requested were estimated in the new sampling size by selecting them from the raster layers by using the new grid and average values for each of the EUNIS categories.

Data sources
Table IT.1 show detailed information about data included in the re-analysis, for all parameters included in the critical loads estimation.

Table IT.1 Parameters for the Critical Loads, the calculation, their sources and algorithms

Variable	Explanation	Units	Source	Algorithm
SiteID	Identifier of the site (see ecords Table)			
CLminN	Minimum critical load of nitrogen	eq/ha/a		CLmin(N) = Ni + Nu
CLmaxS	Maximum critical load of sulphur	eq/ha/a		CLmax(S)=BCdep-Cldep+BCw-BCu-Alkle
CLmaxN	Maximum critical load of nitrogen	eq/ha/a		CLmax(N)=CLmin(N)+CLmax(S)/(1-f_{de})
ClnutN	Critical load of nutrient nitrogen	eq/ha/a		CLnut(N)=Ni+Nu+Nde+Nfire+Neros+ Nvol+Nle-Nfix
cNacc	Acceptable (critical) N concentration for CLnutN calculation	meq/m^3		Nle(acc) = Q×[N]acc

Variable	Explanation	Units	Source	Algorithm
thick	Thickness (root zone!) of the soil	meq/m^3	ESDB	
bulkdens	Average bulk density of the soil	g/cm^3	ESDB	
nANCcrit	The quantity-ANCle (crit)	eq/ha/a		
Cadep	Total deposition of calcium	eq/ha/a		
Mgdep	Total deposition of magnesium	eq/ha/a		
Kdep	Total deposition of potassium	eq/ha/a		
Nadep	Total deposition of sodium	eq/ha/a		
Cldep	Total deposition of chloride	eq/ha/a		
Cawe	Weathering of calcium	eq/ha/a		Naw×2.3
Mgwe	Weathering of magnesium	eq/ha/a		Naw×0.9
Kwe	Weathering of potassium	eq/ha/a		Naw×0.6
Nawe	Weathering of sodium	eq/ha/a		BCw×0.3
Caupt	Net growth uptake of calcium	eq/ha/a		Bcu %
Mgupt	Net growth uptake of magnesium	eq/ha/a		
Kupt	Net growth uptake of potassium	eq/ha/a		
Qle	Amount of water percolating through the roof zone	mm/a		
lgKAlox	Equilibrium constant for the Al-H relationship (log10) (var. formaly known as Kgibb			
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/a			
Nupt	Net growth uptake of nitrogen	eq/ha/a		
fde	Denitrification fraction (0≤fde<1)(-)			
Nde	Amount of nitrogen denitrified	eq/ha/a		
Slope		°	GIS	

Variable	Explanation	Units	Source	Algorithm
Aspect	Angle between North and the perpendicular line of slope (degrees up to 360°, measuring clockwise) (°)		GIS	
Altitude	Above sea level	M		
Prec	Precipitation	mm/a		
TempC	Temperature	T°		
Theta	Water/moisture content	m^3/m^3	ESDB	
Corg	Organic carbon content (%)		ESDB	
sand	% sand in soil		ESDB	
clay	% clay in soil		ESDB	
bsat	Base saturation (-)		ESDB	
Cpool	Amount of carbon in topsoil	g/m^2	ESDB	
CNrat	C/N ratio in topsoil	g/g	ESDB	

Many local to regional studies have shown that chronic N deposition leads to a shift in the plant species composition of the forest floor and eventually to diversity loss. Actually, biodiversity indices are to be estimated for some Italian test-sites in order to verify a direct or an indirect relationship between nitrogen critical loads and plant diversity at the herbaceous level. Preliminary results highlighted very different correlations among different biodiversity indices and N critical loads and absence of relationships in some test-sites in central Italy.

References

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