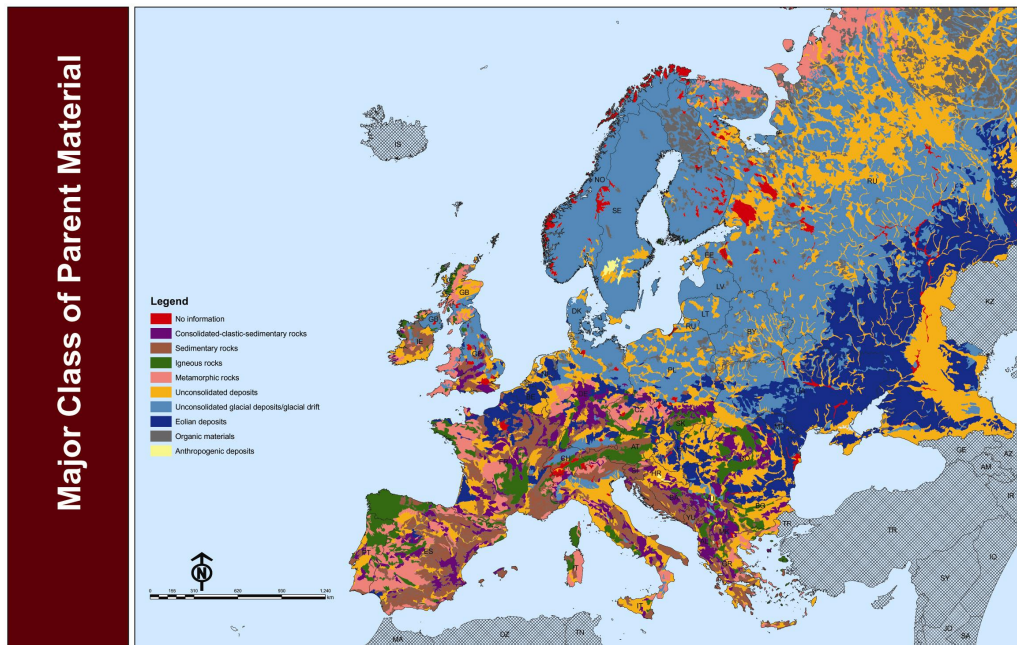


# PARENT MATERIAL AS A SOURCE OF NATURAL BACKGROUND VALUES IN SOILS

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The map 1:1M for Euroasia was build up according to Soil Geographical Database for Eurasia & the Mediterranean instruction guide. Structure of database is formed by Soil Mapping Units (SMU), which comprise from one or more Soil Typological Units (STU). Each SMU has to be represented on the map. STU define soil types with homogenous properties, e.g. soil type, texture, parent material. Each STU has soil profile described in the Soil Profile Database. Parent material is studied at four levels: major class, group, type and subtype.



Mineral	Main Elements / Heavy Metals	Weathering Rates
Olivine	Ni, Co, Cu, Zn	Fast
Hornblende	Ni, Co, Zn, Cu, Mn	Fast
Anorthite	Cu, Mn	Fast
Augite	Ca, Al, Fe, Mg, Si	Fast
Anorthite	Ca, Al, Si	Fast
Olivine	Mg, Fe, Si	Fast
Dolomite	Ca, Mg	Fast
Calcite	Ca, CO <sub>2</sub>	Fast
Gypsum	Ca, SO <sub>4</sub>	Fast
K-Feldspar	K, Cu, Ga	Slow
Muscovite	Cu, V	Slow
Magnetite	Zn, Co, Ni, Cr, V	Slow
Goethite	Fe, OH	Slow
Hematite	Fe	Slow
Gibbsite	Al	Slow

Properties of parent material influence directly processes of soil formation and natural soil properties. pH is one of the most important criterion of parent material specification. Acidic materials (granites, rhyolites, diorites) are basis for acidic soil formation. In these soils predominate minerals as quartz, feldspar and oxides. Al and Fe are in soluble forms. Usually these soils are less fertile because of low content of nutrients elements like Mg, Ca, etc. and more risky for pollutants movement through soil profile.

pH	
Extremely acid	≤ 1.15
Very acid	1.16 - 1.35
Acid	1.36 - 1.45
Slightly acid	5.6 - 6.5
Neutral	6.6 - 7.2
Alkalic	7.3 - 7.7
Very alkalic	> 7.7

Element (mg kg <sup>-1</sup> )	Background Natural Values	Slightly Higher Values	Contamination	High Contamination
Cadmium	< 0.8	0.8 - 5.0	5 - 20	> 20.0
Lead	< 85	85 - 150	150 - 600	> 600
Chromium	< 130	130 - 250	250 - 800	> 800
Mercury	< 0.3	0.3 - 2	2 - 10.0	> 10.0
Arsenic	< 29	29 - 30	30 - 50	> 50
Copper	< 36	36 - 100	100 - 500	> 500
Cobalt	< 20	21 - 50	50 - 300	> 300
Zinc	< 140	140 - 500	500 - 3000	> 3000
Nickel	< 35	35 - 100	100 - 500	> 500
Selenium	< 0.8	0.8 - 5.0	5 - 20	> 20
Beryllium	< 3.0	3 - 20	20 - 30	> 30
Barium	< 500	500 - 1000	1000 - 2000	> 2000
Molybdenum	< 1	1 - 40	40 - 200	> 200
Tin	< 20	20 - 50	50 - 300	> 300
Phosphorus	< 500	500 - 1000	1000 - 2000	> 2000
Sulphur	< 2	2 - 20	20 - 200	> 200
Bromine	< 20	20 - 50	50 - 300	> 300

Basic materials usually have low content of soluble Al and Fe and high representation of Ca and Mg. These soils have more stable soil properties e.g. high buffer capacity. They are less risky for environment because most pollutants in their profile are less soluble.