## Soil Biodiversity Atlas: mapping earthworms of Europe

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Soil maps are increasingly used for nature conservation, spatial planning, environmental modelling and soil management issues, and have great potential in awareness raising. However, large area maps of soil biodiversity hardly exist, due to lack of data and harmonized methods, and the great variety of organisms thriving in soils. Still, some soil biodiversity datasets are available, although often not publically. Recently, German and Dutch data on soil biota were made freely accessible via the global diversity portal GBIF (Global Biodiversity Information Facility; www.GBIF.org).

As a spin-off of the FP7-EU EcoFINDERS project, we are producing a first European soil biodiversity map. We selected earthworms as the targeted soil organisms, as they appear to be one of the organism groups for which abundant data are available. Protocols for field sampling and analysis are rather straightforward and relatively common across different countries, and they are one of the more 'charismatic' soil organisms. Some earthworms species are considered as ecosystem engineers; their importance was already described in 1881 by Charles Darwin in his monograph 'The formation of vegetable mould, through the actions of worms, with observations on their habits (J. Murray, London).'
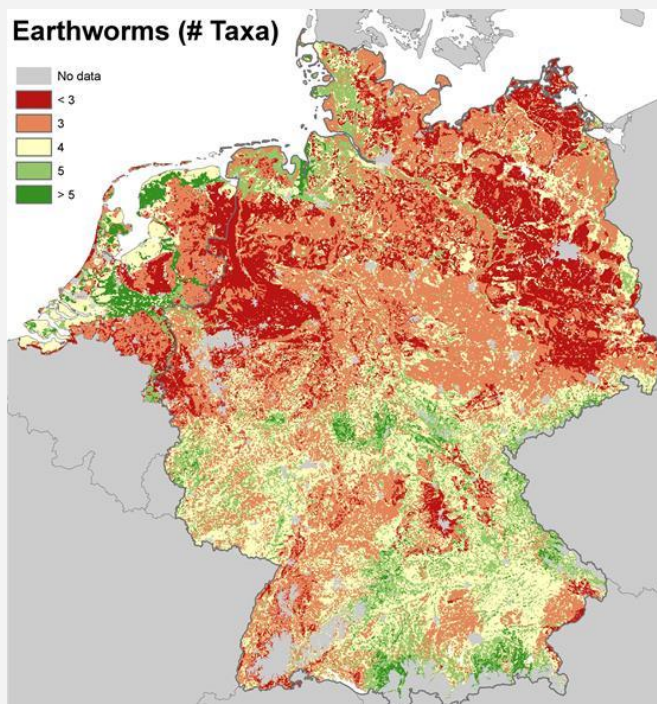
In order to arrive at reasonable surface coverage of countries for which abundant earthworm data are available (such as the Netherlands and Germany; Fig. 1) we applied a 'digital soil mapping' approach. Multiple regressions are used to relate scarce earthworm data to land use and soil characteristics (covariates) with a higher spatial resolution. Statistically significant relationships were used to build habitat response models for constructing earthworm maps with abundance, number of taxa (species) and some common species (e.g. *Aporrectodea caliginosa*). To our knowledge, this will be the first earthworm map of (parts of) Europe. Please join this initiative by providing yet unidentified data on earthworms elsewhere in Europe (michiel.rutgers@rivm.nl). The final map will be submitted for publication in the 1st Global Soil Bodiversity Atlas.

Fig. 1: Preliminary earthworm map of Germany and the Netherlands showing the extrapolated number of identified taxa of 100 individuals per site.