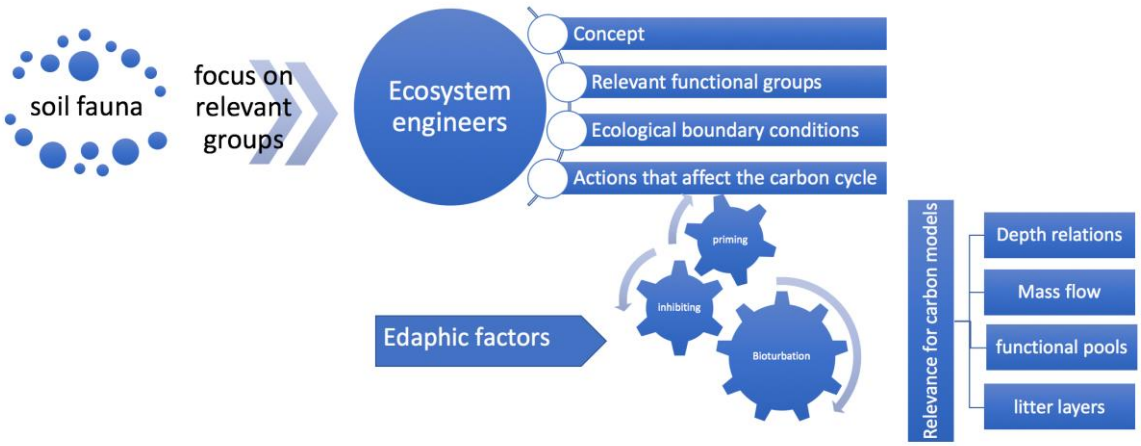
KEYSOM – STSM to UVigo (Maria J.I. Briones) by KU Leuven (Karen Vancampenhout), November 2016

Research abstract and figure

By Dr. Vancampenhout and verified by Dr. MJI Briones

Soils hold the largest terrestrial carbon pool, essential to a multitude of ecosystem services. Global soil carbon models are a vital tool to envise stocks and turnover, as to develop effective management decisions and sustainable policies. There is ample evidence in the literature on the importance of soil fauna for carbon cycles; however, to date the research produced has had very little impact on current models and as a result, they merely focus on abiotic factors and microbial decay. We identified two major hurdles in trying to incorporate the effects of soil fauna into soil carbon predictive models: (i) the enormous complexity in quantifying the huge diversity of soil fauna and identifying the active taxa on every trophic level; (ii) the fact that soil biology and soil biogeochemistry are still separate domains, with an immense array of different concepts and terminology used. We, therefore, propose to join efforts and target a limited number of groups that have shown to have a strong impact on carbon cycles. We believe that the 'ecosystem engineer' concept is a promising avenue, since it also encompasses the effects of these organisms on the surrounding habitat and hence, affecting the performance of other organisms and altering the fluxes of matter and energy. These animals (namely earthworms, termites and ants) are therefore expected to have a significant impact on soil functions that transgresses the local or plot levels. Earthworms, in particular, have been divided into functional groups, namely epigeic, anecic and endogeic with distinct impacts on the carbon cycle. This review work will therefore focus on (i) clarifying and re-defining the concept of 'ecosystem engineer' (ii) compiling the relevant literature on relevant taxa, edaphic boundary conditions and interactions with the carbon cycle, (iii) building a joint reference database for advancing the development of future carbon models.


soil fauna
focus on relevant groups
Ecosystem engineers
Concept
Relevant functional groups
Ecological boundary conditions
Actions that affect the carbon cycle
priming
inhibiting
Bioturbation
Edaphic factors
Relevance for carbon models
Depth relations
Mass flow
functional pools
litter layers