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**Frazão, J., Pulleman, M.M., Crittenden, S., Faber, J.H., Groot, J.C.J. and Brussaard, L. Spatial distribution and dispersal of earthworms in a complex landscape – implications for ecosystem services. Poster presentation**

Intensive agriculture differently affects earthworm functional groups, thereby affecting associated soil ecosystem services, e.g. organic matter decomposition, soil structure formation and water retention. Within agricultural landscapes, biodiversity at the local scale can be strongly influenced by the landscape context and by interactions between the management of agricultural land and (semi-)natural landscape elements. Such spatial interactions depend on the dispersal behaviour and other ecological characteristics of organisms, in this case earthworms. So, the potential for restoration of earthworm communities and associated ecosystem services will vary with spatial and temporal scales, and depends on the behaviour and life-history traits of species and the dynamics of soil and landscape management. Our ongoing project is aimed at understanding how these interactions affect the dispersal and spatial distributions of earthworm species, as well as earthworm-mediated soil ecosystem services, in complex landscapes.

As a first step, we present a methodological framework for connecting soil biodiversity with landscape configuration and management. The study area, the Hoeksche Waard in the Netherlands, consists of a network of polders of different landscape complexity. The soils are marine loam soils, dominantly used for arable crop production. The area is also characterized by an active community of stakeholders interested in the stimulation of biodiversity, soil quality and ecosystem services in the landscape. The methodological framework builds on (i) the collection of data on the spatio-temporal distribution of earthworm communities across the landscape, (ii) data on the configuration and management of cropland and semi-natural habitats, (iii) the use of earthworm ecological trait databases, (iv) spatially-explicit modelling and (vi) participatory workshops. We will test the hypothesis that a trait-based approach will give us a better predictive understanding of earthworm species response to the main habitat-selecting factors in cropland and non-crop elements in the landscape, as well as their impacts on ecosystem functions and services. The acquired understanding based on response and effect traits can improve modelling spatial relations between land-use (changes) and earthworm-mediated ecosystem services. Such knowledge will provide the basis for decision-support tools for enhancing earthworm-mediated ecosystem services in complex landscapes.