



## **Modeling soil organic matter decomposition, microbial interactions, and radiocarbon dynamics in soils: the SOILR package**

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Soil organic matter is a very important component of the Earth System and plays a significant role in biogeochemical cycling and climate regulation. SOILR is a modeling framework that contains a library of functions and tools for modeling soil organic matter decomposition, microbial interactions, and radiocarbon dynamics under the R environment for computing. It implements a variety of model structures and tools to represent carbon storage and release from soil organic matter. In SOILR, organic matter decomposition is represented as a nonlinear system of ordinary differential equations that generalizes the structure of most compartment-based decomposition models. With this approach, it is simple to implement new or existing models allowing comparisons of different model structures. A variety of functions is also available to represent environmental effects on decomposition rates, calculation of transit times, and radiocarbon incorporation in soil from the atmosphere. In this presentation we will show 1) details about the mathematical framework, 2) the computational implementation, and 3) examples on how it is used.