Modeling radiocarbon dynamics in soil organic matter

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Radiocarbon is an important tracer of the global carbon cycle that helps to understand carbon dynamics in soils. It is useful to estimate different system metrics such as the mean age and the mean transit time of organic matter in the soil system. We introduce here a set of functions to model the fate of radiocarbon in soil organic matter. Here we present the main system equations and functions to calculate the distribution of ages and transit times for different pools and the entire soil system. We introduce a novel algorithm to calculate age and transit time distributions as a function of time for any soil organic matter decomposition model. Also, we present examples on how to obtain parameters of pool-based models from radiocarbon data using inverse parameter estimation.