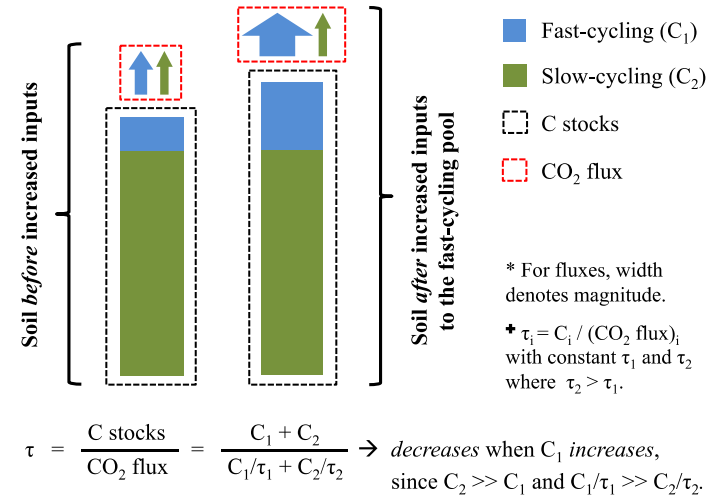
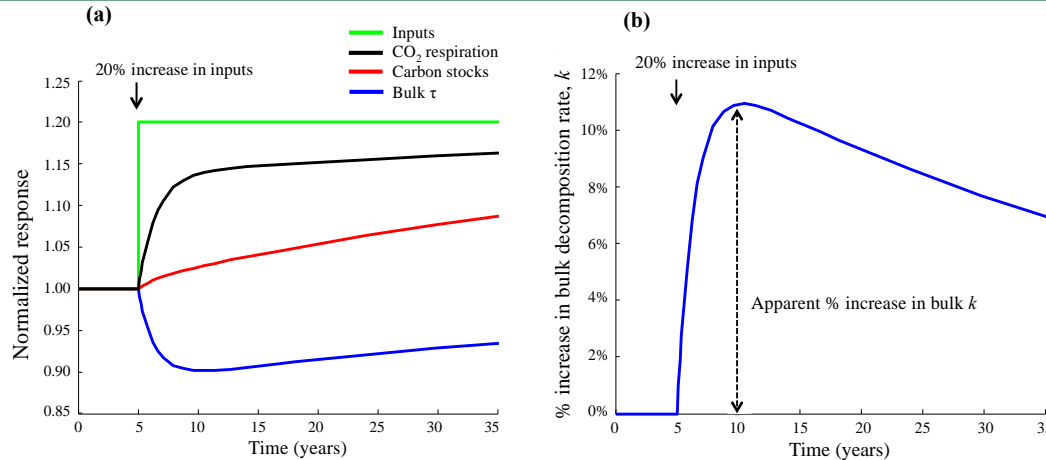


Toward improved model structures for analyzing priming: Potential pitfalls of using bulk turnover time



Objectives:

- Determine whether the typical one-pool soil carbon model is appropriate for inferring changes in decomposition rate constants in response to elevated CO₂ and plant inputs (i.e., priming).
- Suggest model structures and observational constraints necessary for projections of the priming effect.

Approach:

Using a multi-pool soil carbon model, we show that changes in carbon flows that would be attributed to priming in a one-pool model can be explained without a change in decomposition rate constants of individual pools. Therefore, the typically applied one-pool approach is not adequate to infer priming.

Results/Impacts:

- Our study challenges the analytical framework used to quantify stimulated decomposition of soil carbon in response to increased plant inputs (i.e., priming).
- We explain the limitations of using simple soil carbon models and suggest solutions for incorporating priming in earth system models for projections of global change.

Georgiou, Katerina, **Charles D. Koven**, **William J. Riley**, and Margaret S. Torn (2015), Toward improved model structures for analyzing priming: Potential pitfalls of using bulk turnover time, *Glob. Change Biol.*, 21(12):4298–4302, doi:[10.1111/gcb.13039](https://doi.org/10.1111/gcb.13039).