Supplementary material for “Revisiting overflow metabolism and its impact on soil carbon cycling”

EGUSPHERE-2026-3590

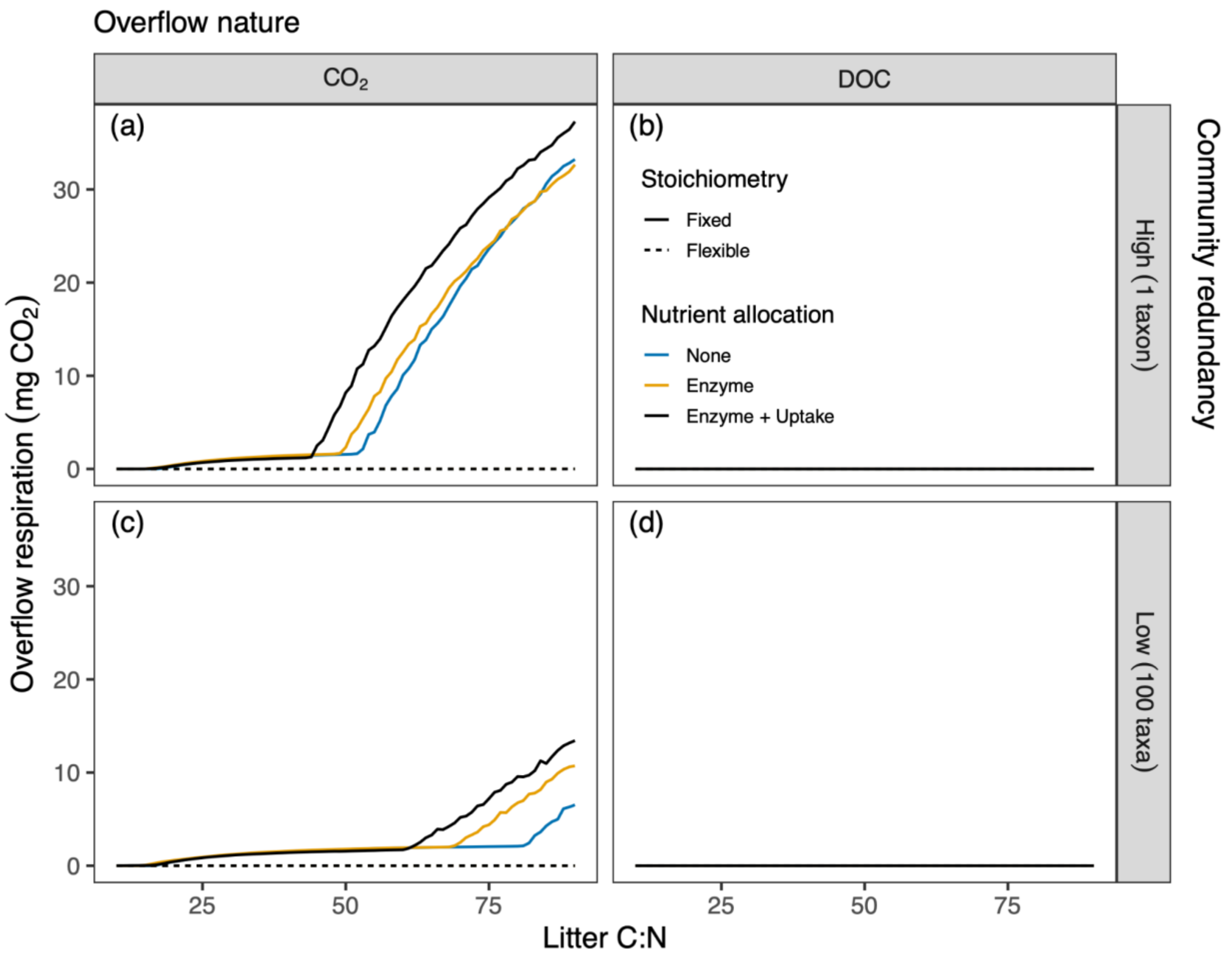

Figure S1. Total overflow respiration across initial litter C:N. Vertical panels separate simulations by the nature of overflow. Horizontal panels separate simulations by community context. Line type distinguishes between fixed and flexible biomass stoichiometry. Colors represent the nutrient allocation strategy.

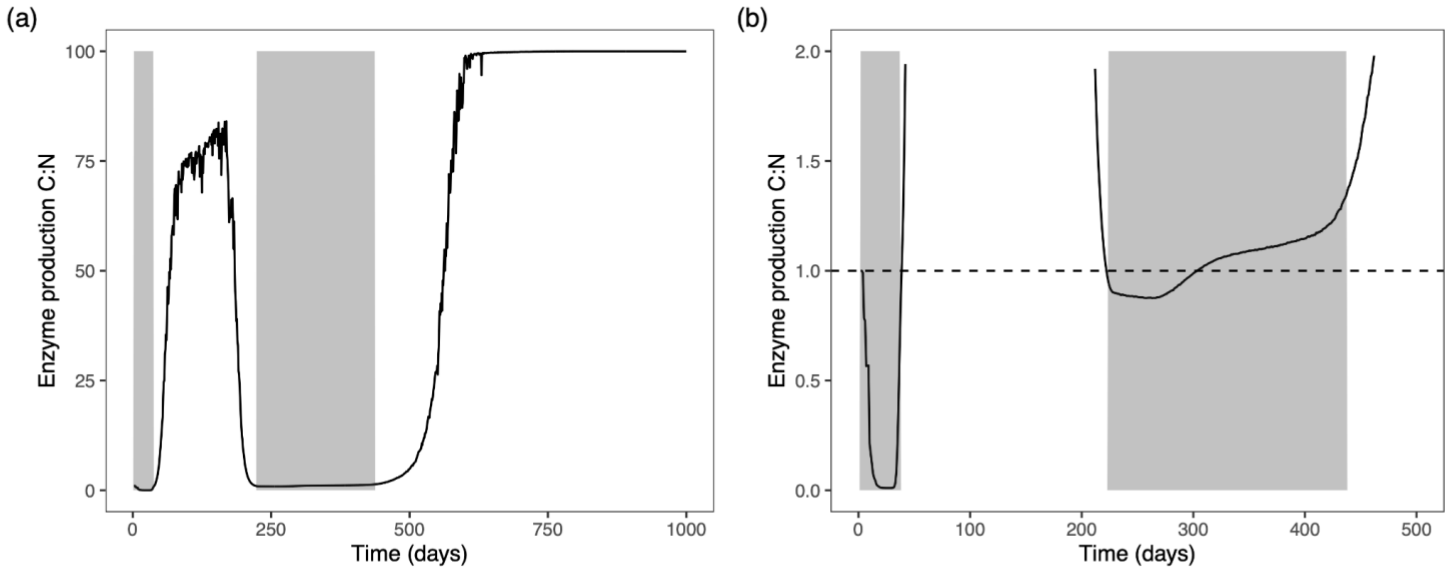

Figure S2. Enzyme C:N allocation across time. This particular simulation corresponds to the high redundancy community (1 taxon) decomposing litter with an initial C:N value of 90. Enzyme C:N allocation corresponds to the abundance of cellulase over the abundance of enzymes that target the pool of inactive enzymes. These two enzymes were chosen since each is regulated by only one element, C and N respectively (Table 1). The gray areas mark the time periods when overflow respiration happened, indicating periods of carbon excess (i.e., N limitation). Panel (b) is a magnification of panel (a), to visualize the detail at low enzyme C:N allocation values.

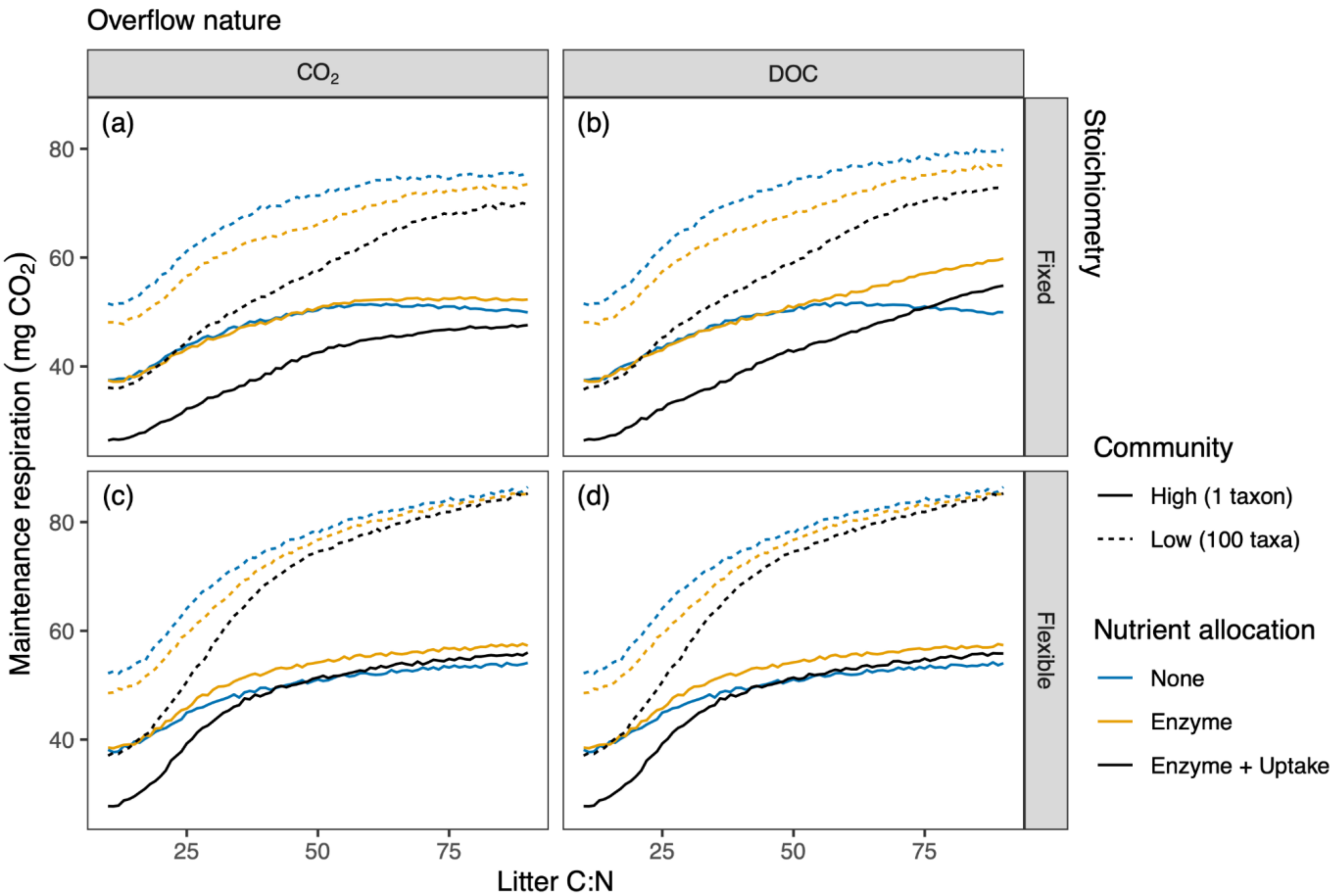

Figure S3. Total maintenance respiration across initial litter C:N. Vertical panels separate simulations by the nature of overflow. Horizontal panels separate simulations by biomass stoichiometry flexibility. Line type represents the community context. Colors represent the nutrient allocation strategy.

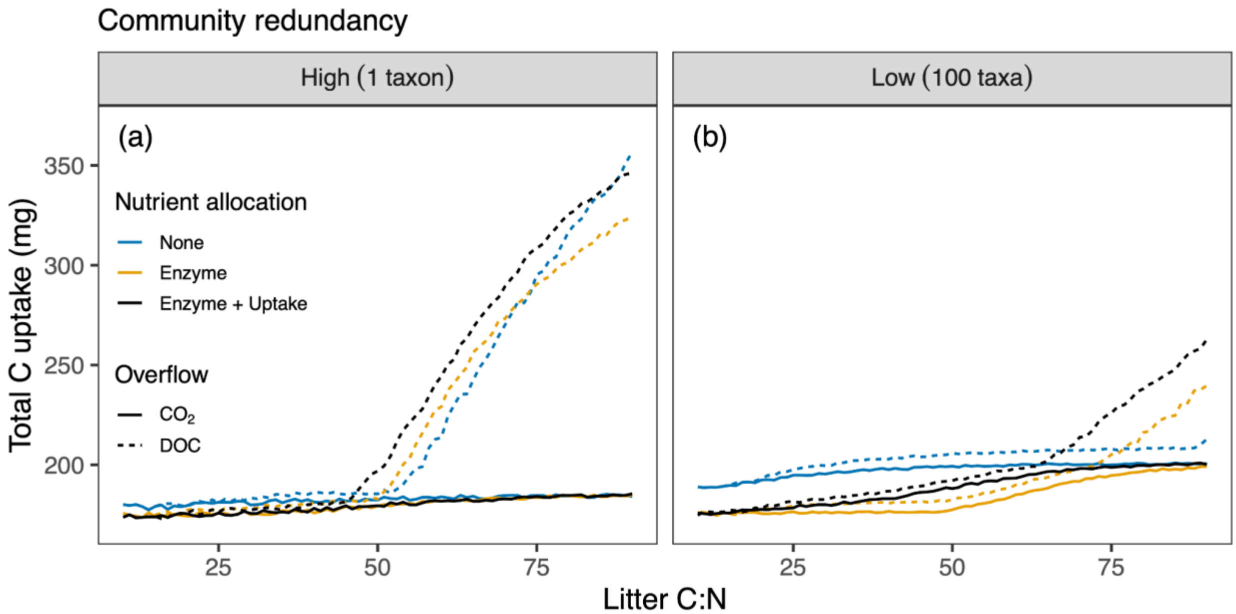

Figure S4 Total carbon uptake across initial litter C:N. Vertical panels represent community context. Line type represents the nature of overflow. Colors represent the nutrient allocation strategy. Simulations with flexible stoichiometry were excluded since no C overflow was observed.

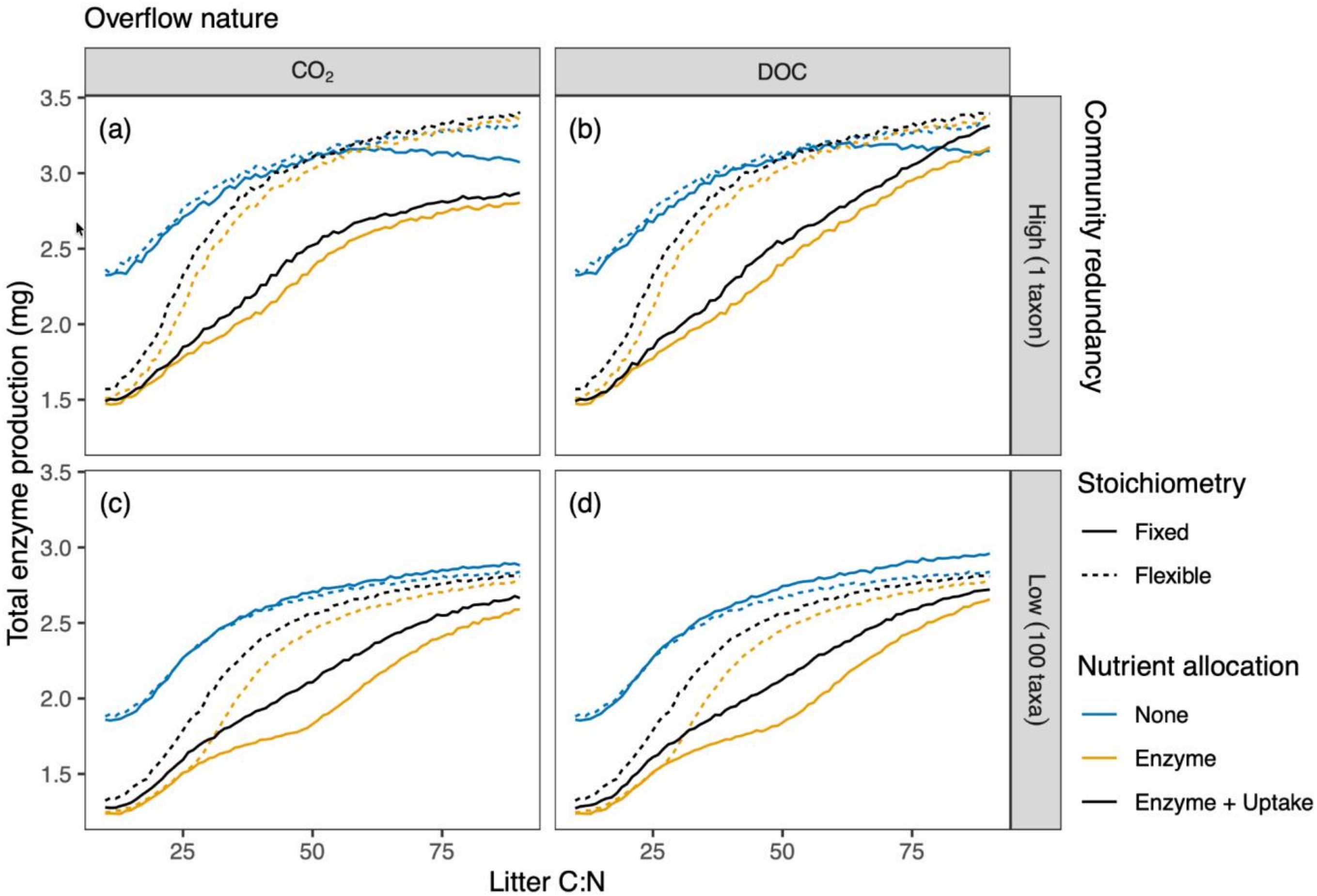

Figure S5. Total enzyme production across initial litter C:N. Vertical panels separate simulations by the nature of overflow. Horizontal panels separate simulations by community context. Colors represent strategies for nutrient allocation. The line type distinguishes between fixed and flexible biomass stoichiometry.

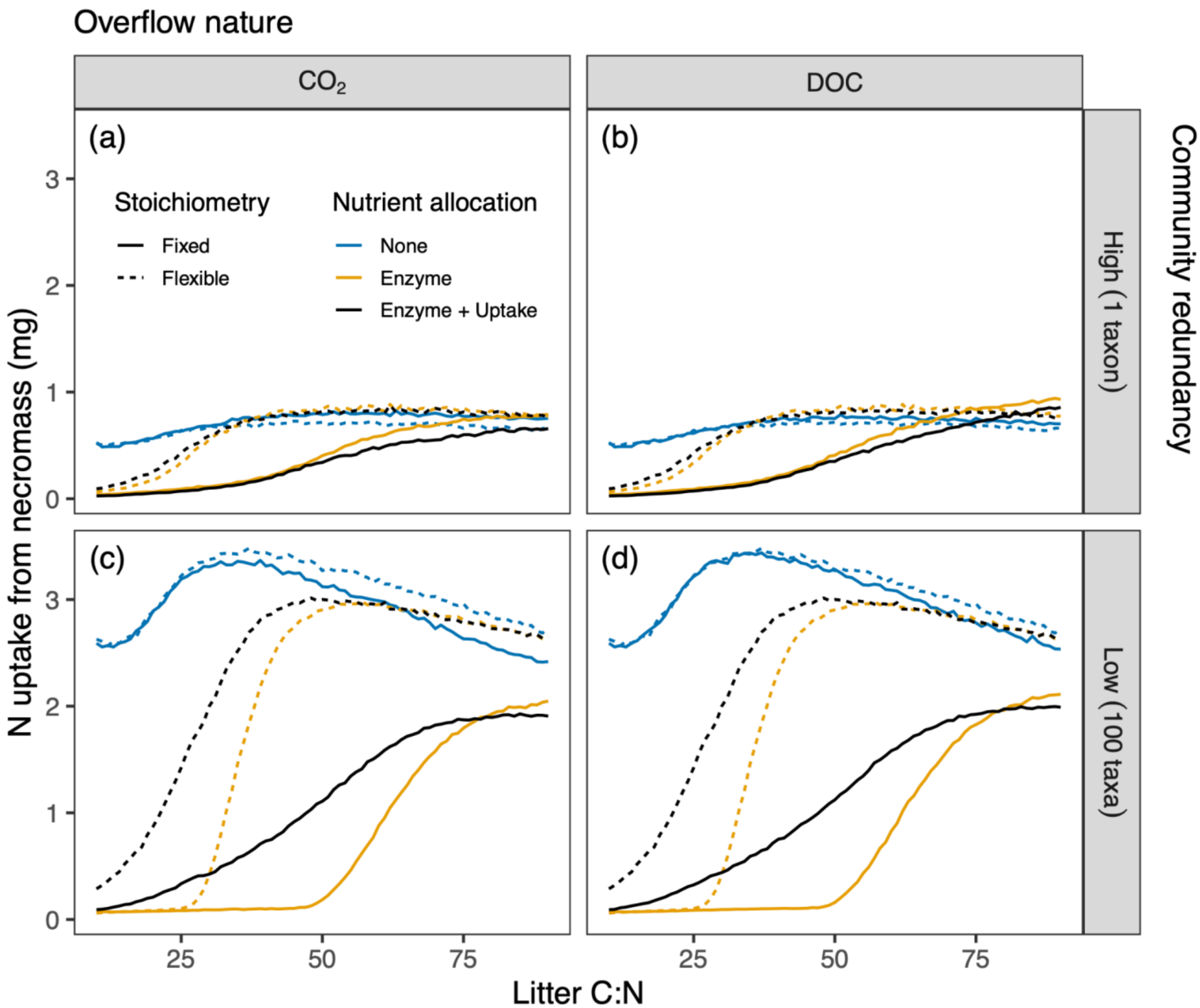

Figure S6. Total nitrogen uptake from microbial necromass across initial litter C:N. Vertical panels separate simulations by the nature of overflow. Horizontal panels separate simulations by community redundancy contexts. Colors represent strategies for nutrient allocation. The line type distinguishes between fixed and flexible biomass stoichiometry.

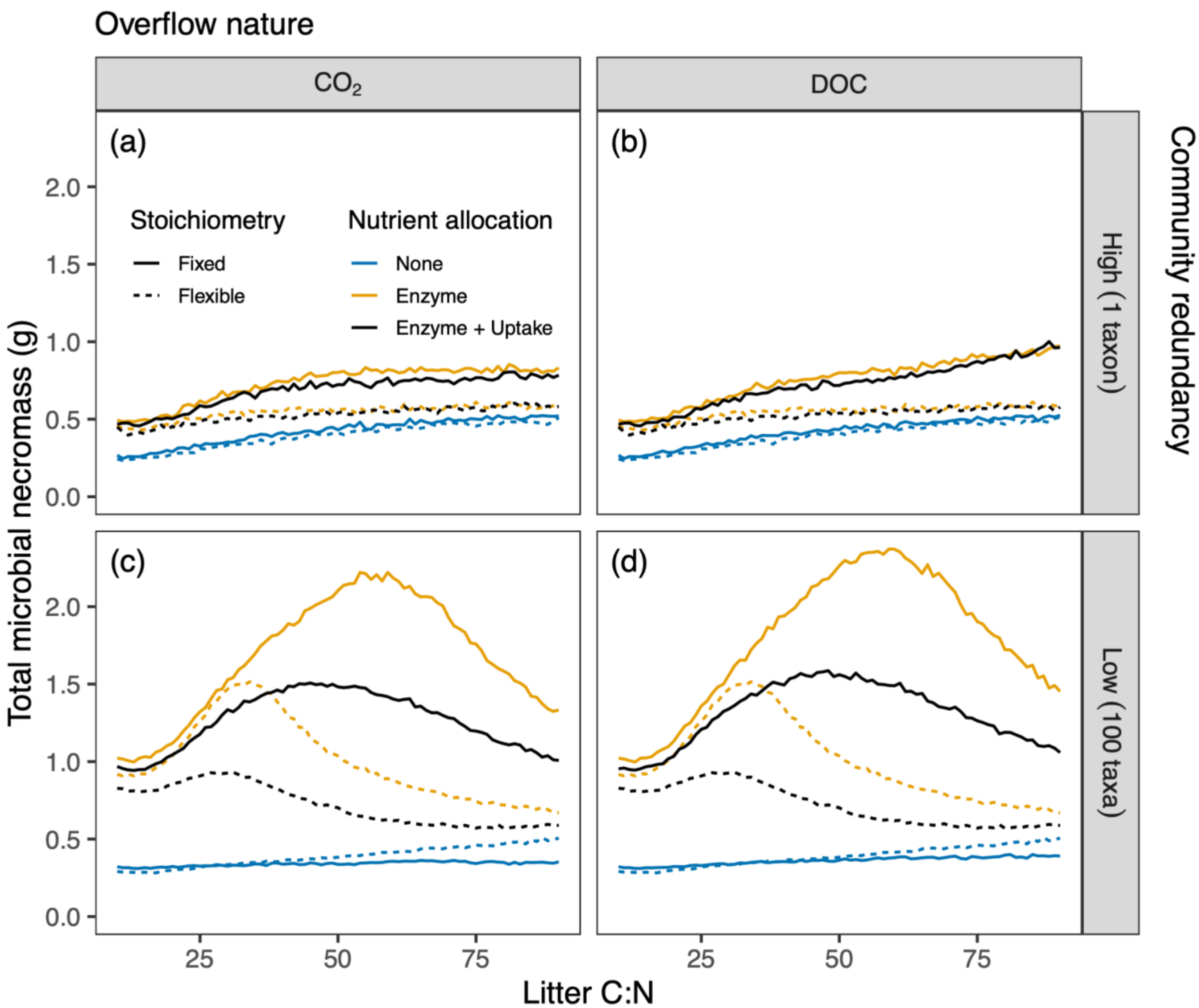

Figure S7. Total microbial necromass produced across initial litter C:N. Vertical panels separate simulations by the nature of overflow. Horizontal panels separate simulations by community redundancy contexts. Colors represent strategies for nutrient allocation. The linetype distinguishes between fixed and flexible biomass stoichiometry.

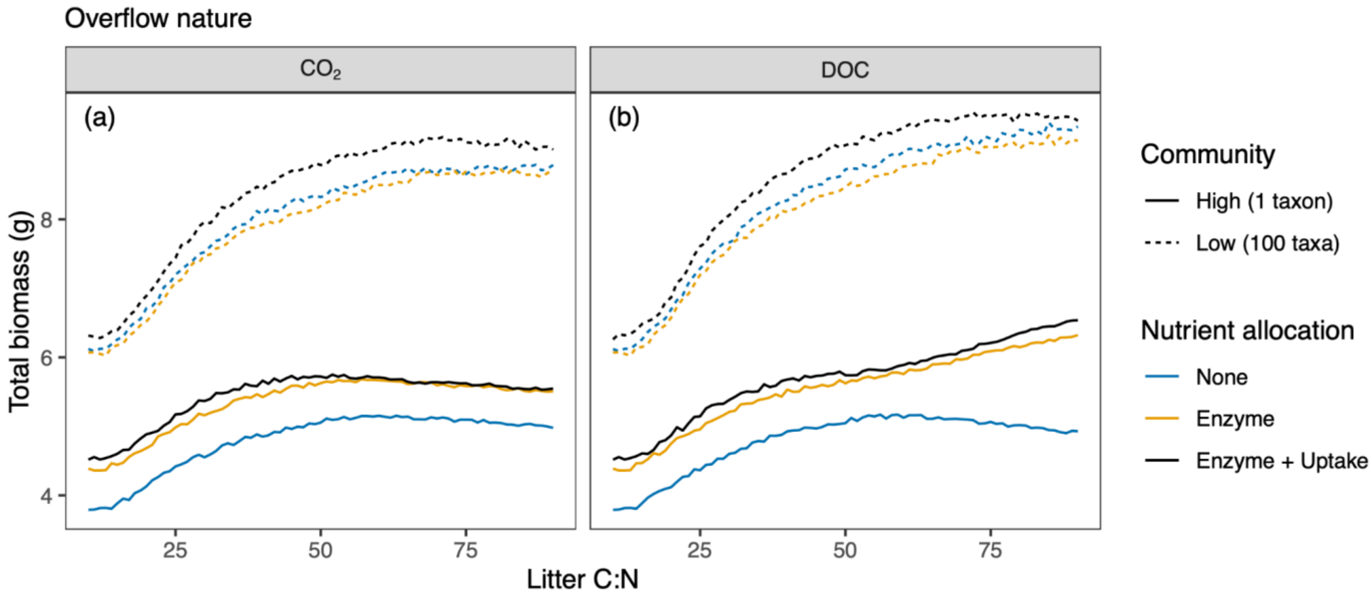

Figure S8. Total biomass across initial litter C:N. Vertical panels separate simulations by the nature of overflow. Colors represent strategies for nutrient allocation. The line-type distinguishes between high and low redundancy community contexts. Simulations with flexible biomass stoichiometry were excluded.