The impacts of drought on Amazon carbon sink capacity are permeated by uncertainties. The underexplored impacts on functional diversity (richness, divergence and evennes) and how it modulates carbon sink is a missing piece in this puzzle, since it directly affects ecosystem functioning, although the mechanisms for this connection are still under debate. Here we investigate how a 50% reduction in rainfall can affect carbon stocks and functional diversity in Amazon. For this, we used two modelling approaches in which functional diversity is or is not predefined and hard coded: one model version uses a plant functional type approach (PFTA; fixed trait values in 3 tropical PFTs) and the other version uses a varying trait-based approach (TBA; semi-random combination of trait values creating 3000 plant life strategies). Six functional traits were considered as fixed/variant: carbon allocation and residence time on leaves, aboveground woody tissues and fine roots. The imposed drought caused a widespread and similar magnitude loss of carbon storage in both approaches (~60%). Nevertheless, geographical pattern of loss was different, with TBA showing more subtle changes along the basin, mainly on its southern limits. Also, the TBA presented an increase in fine roots investment (~10%), whereas the PFTA reduced carbon in all plant compartments. The changes on functional diversity were different in magnitude and direction between approaches: TBA(PFTA) showed for fine roots allocation +19.33%(+4.94%) in richness; +276.54%(-74.71%) in evenness and -26.01%(+0.15%) in divergence. It was a result of community functional reorganization, allowing previously rare trait values to increase its density and change functional composition. This modeling exercise demonstrates that the inclusion of higher functional diversity did not show significant difference in total carbon loss, mainly because the photosynthesis and respiration process were not modified. However the *a priori* non-determination on trait values allowed the apprehension and evaluation of important subtle changes on geographical carbon loss pattern. Moreover it opens the opportunity to explore the functional diversity-ecosystem process connection as well as how communities respond to climate change in terms of its functional structure, composition and diversity.