*Reduced precipitation impacts on carbon storage and partitioning: trait-based vs. PFT approach*

As expected, the 50% reduction of precipitation caused a widespread depletion of carbon stocks along the basin both for the high and low degrees of functional diversity employed in the model, including grid cell that presented a total carbon loss (Fig. 2a and 2b). However, in line with the hypothesis H1 the spatial pattern of carbon loss driven by the imposed moisture deficit differed between the trait-based and PFT approaches: TBA was able to maintain carbon stocks in some areas where in PFTA carbon stocks were completely lost, that is, none PFT survived in that grid cell. This is more evident in naturally drier areas, such as the transition between the Amazon forest and the savannah (*cerrado*) and central Amazon. It is noteworthy also that the loss of carbon in TBA is more gradual, i.e., there is a smoother gradient between a grid cell value and its neighboring cells, and also across different basin regions. On the other hand, in the PFTA the carbon loss is more abrupt both between neighboring cells and along the regions of the basin.

Supporting our hypothesis H2 specific plant compartments have shown different patterns of changes when comparing the two approaches (Figure 2c and 2d for fine roots and Figure SM.2 for leaves and ABGW). None of the compartments has shown, for any area, an increase in carbon stock with precipitation reduction, except for the fine roots compartment in TBA (blue areas in Figure 2d). It was mainly observed in the transitions from humid and evergreen forest to the Brazilian savannahs (*cerrado*) and also in the basin northwest (naturally drier sites). The increase in fine roots investiment also indicated change in carbon partitioning (root:shoot relation) towards higher belowground investment for the latter approach. The change in mean value for root:shoot relation show this change in carbon partitioning: we found a mean increase of 74.74% on this variable for TBA while for PFTA a mean decrease of 7.73% was observed.

An interesting and important result with the experiment scenario is the unexpected higher total carbon storage in PFTA when compared to TBA in grid cells where both approaches were able to maintain at least minimum carbon stock (Fig. 2a and b). It goes against our hypothesis H1 in which we predicted higher carbon stocks maintenance for TBA.