**Simulating the response of mixed broadleaved forests to changes in climate conditions: disentangling the relative importance of various abiotic factors**

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Forests will face in the future unprecedented climatic conditions that are expected to impact them in various and sometimes opposite ways. The fertilizing effect of rising atmospheric CO2 concentrations and nitrogen deposits added to the lengthening of the vegetation period due to warmer temperatures are likely to increase forest productivity. These effects could be offset or even reversed by the increase of drought frequency and severity that trigger stomatal closure and can even lead to tree death. Due to the complex interactions between these factors, their spatial variability and the uniqueness of their combinations, the future forest response to climate change cannot be deducted only from observational studies or environmental manipulation experiments. Here, we use HETEROFOR, an individual and mechanistic tree growth model recently developed and evaluated to simulate the gross primary production of diverse mixed broadleaved forest according to different climatic scenarios. Among the model outputs, a drought index accounting for both the length and the magnitude of the stand hydric deficit is calculated. First, these simulations are conducted with atmospheric CO2 concentration values maintained constant, then with those from the IPCC scenarios. The results of these simulations are finally used to assess the impact of the various abiotic stressors and their interactions on forest productivity. In a second step, a second set of simulations is launched to assess the impact of the soil properties and of the stand composition, structure and density on tree growth by interchanging soil and forest structures subjected or not to different thinning intensity.