

Ecological Archives A025-015-A1

Gabriel I. Yospin, Scott D. Bridgham, Ronald P. Neilson, John P. Bolte, Dominique M. Bachelet, Peter J. Gould, Constance A. Harrington, Jane A. Kertis, Cody Evers, and Bart R. Johnson. 2015. A new model to simulate climate-change impacts on forest succession for local land management. *Ecological Applications* 25:226–242. <http://dx.doi.org/10.1890/13-0906.1>

APPENDIX A. CO₂ parameterization experiments.

We attempted to explore the CO₂ parameterization in MC1 in two ways. The first way was to alter the atmospheric CO₂ concentrations that are input into the model. We used the actual A2 CO₂ concentrations as the "high" CO₂ fertilization effect, a reduced CO₂ concentration ramp as the "low" CO₂ fertilization effect, and a constant level of CO₂ (the recorded, 2006 level) as the "no" CO₂ fertilization effect. We found no difference in any MC1 output variables, except for the amount of C4 grass leaf area index, which increased by about 10% over the future period under the "high" CO₂ scenario.

The above approach was not ideal, because it changed the atmospheric concentration of CO₂ to achieve a physiological effect. We therefore continued to explore the CO₂ fertilization effect in MC1 by changing the parameters that control the efficiency of plant transpiration and photosynthesis: *co2itr* and *co2ipr*. *co2itr* is the effect of doubling CO₂ concentration on the rate of transpiration, and *co2ipr* is the effect of doubling CO₂ concentration on the rate of photosynthesis. We ran the model under three different parameterizations of *co2itr* and *co2ipr* (Table A1). In 2007 (the first year of the model's future run), the different CO₂ fertilization scenarios had no effect on the amount of live tree carbon (Table A2), tree net primary productivity (Fig. A1), leaf shape index, and C4 grass leaf area index.

TABLE A1. Parameterization of *co2itr* and *co2ipr* to achieve different levels of CO₂ fertilization in MC1.

<i>CO₂ Effect</i>	<i>co2itr</i>	<i>co2ipr</i>
High	0.4	1.6
Moderate	0.75	1.25
None	1	1

TABLE A2. Live tree carbon (kg/m²) from three points in the study area in 2007.

Grid Cell	High CO ₂ Effect	Moderate CO ₂ Effect	No CO ₂ Effect

1	18.5	18.5	18.5
2	22.25	22.25	22.25
3	28	28	28

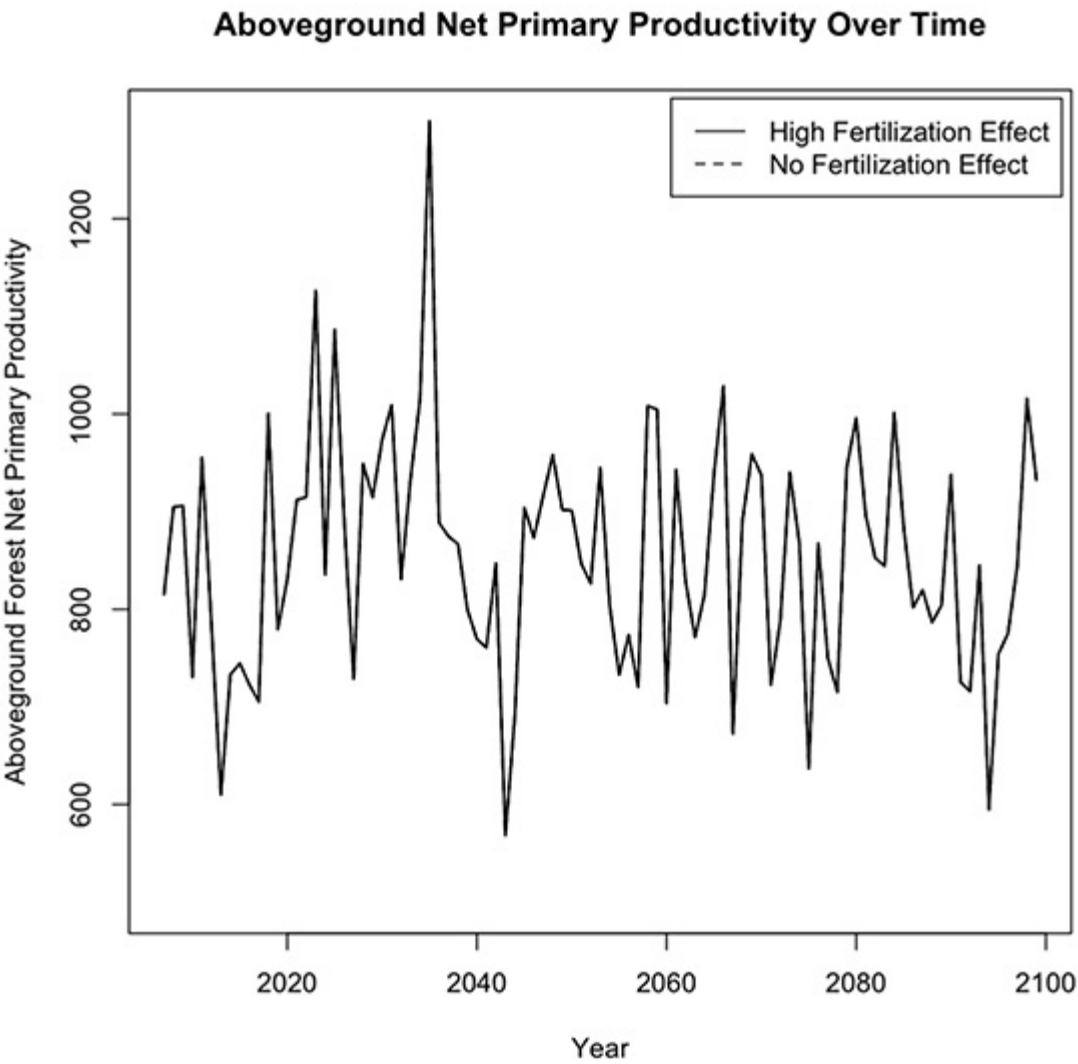


FIG. A1. Aboveground tree NPP (g C/m²) with no CO₂ fertilization effect (dashed line), and with the high CO₂ fertilization effect (solid line), as specified in Table A1, for grid cell 2 from Table A2. Only one line is visible for this grid cell because the values were identical for the two simulations. All other grid cells examined show identical congruence between no- and high-CO₂ fertilization simulations.

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