

Interactive comment on “The Yale Interactive terrestrial Biosphere model: description, evaluation and implementation into NASA GISS ModelE2” by X. Yue and N. Unger

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These corrections should be made to citations for vegetation biophysics and soil respiration.

Section 3.1 Vegetation biophysics The ModelE2 vegetation biophysics section needs to be corrected for the following.

p. 3152, line 15: The paragraph should open with the sentence, “The vegetation leaf and canopy biophysics are as described in Schmidt et al (2014), and we provide details and modifications here.”

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p. 3154, lines 1-2: Replace with, “where R_d is the rate of dark respiration, for which we modified the ModelE2 specification of $0.015 V_{cmax}$ (Caemmerer 2000) to $0.11 V_{cmax}$ for C3 plants (Farquhar et al 1980) and $0.025 V_{cmax}$ for C4 plants (Clark et al. 2011).”

p. 3154, lines 12-15: The solution to the coupled photosynthesis-stomatal equations in ModelE2 is not by Baldocchi (1994), but is an entirely different solution by Dr. Igor Aleinov. Also, both schemes solve for A and not for c_i . This citation is also incorrect in Unger et al. (2013). The sentence needs to be replaced with: “The coupled equation system of photosynthesis, stomatal conductance and CO₂ diffusive flux transport equations form a cubic of A that is solved analytically (Igor Aleinov, unpublished, as part of ModelE2). We note that the citation of Baldocchi (1994) for the cubic solution in Unger et al. (2013) is an error.”

Section 3.2.4. Other PFTs

p. 3159, lines 8-10: Re: “We implement a parameterization for the impact of cold temperature (frost hardening) on the maximum carboxylation capacity (V_{cmax}) so as to reduce cold injury for ENF during winter (Hanninen and Kramer, 2007).” Replace the above with one of the following: “We parameterize the frost-hardening scheme of ModelE2 (Schmidt et al 2014) with <please fill in – what parameter was changed?>” “The reduction in winter maximum carboxylation capacity (V_{cmax}) in ENF to reduce cold injury is the frost hardening scheme as described in Schmidt et al (2014).”

Section 3.4 Soil respiration The appropriate citation for the CASA model is Potter et al (1993), not Schaefer et al. (2008), which cites Potter et al. for part of a coupled model. This section only describes the soil carbon pools and their exchanges in the CASA model, but does not give what responses to temperature and soil moisture are used. Since this is a separate submodel, equations 27-31 are unnecessary detail. However, the temperature and soil moisture responses are often implementation-specific, so some description should be provided. Also, the parameterization of litter quality should be documented in Section 3.3 Carbon Allocation, because this is critical to the

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behavior of CASA. The CASA model was implemented in ModelE2 by developers at GISS and not by the authors. The temperature and soil moisture responses of respiration are unpublished derivations from data, to be published in forthcoming manuscripts on the carbon cycle in ModelE2. Therefore, the text should be revised as follows:

“The soil respiration scheme is that implemented in ModelE (Kharecha et al 2007) based on the Carnegie-Ames-Stanford Approach (CASA) model (Potter et al 1993), with modifications to the respiration responses to soil temperature and moisture re-derived from data of Del Grosso et al (2005) (Kiang, personal communication). The CASA model partitions carbon flows among 12 biogeochemical pools. Three live pools. . .”

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