

Technical Note: A hydrological routing scheme for the Ecosystem Demography model (ED2+R)

This revised version of the paper is a great improvement on the original and I am happy for it to be published subject to minor corrections.

The paper submitted by the Authors demonstrates the application of the Ecosystem Demography (ED2) Model which has been improved by including a river routing routine to form the ED2+R model. The paper presents a scientifically rigorous procedure of calibration and validation of the ED2+R model. The calibration period used is almost 16 years of data excluding 5 years that was excluded for “model initiation”. The validation period is also of a reasonable duration of 15 years. The analysis of the model performance is very thorough and includes 5 different well recognised methods. The limitations are well discussed by the authors, including the coarse spatial resolution of the data and the limitation of the soil depth to 6m, where the soils may be much deeper in reality. The limitation of assuming homogenous soil properties for the entire soil column is also considered. Having a model that is able to simulate the effects of CO₂ on vegetation is valuable, especially in the context of climate change studies.

Specific minor technical corrections are listed below:

Pg3 Line 18: remove the word “after”.

Pg3 Line 31 and 32: Write Muskingham Cunge as Muskingham-Cunge (i.e. hyphenate) as has been done on page 7 line 24.

Pg4 Line 10: insert the word “a” before the word “result”

Pg4 Line 30: Delete the word “from” and replace with the word “of”.

Pg5 Line 4: change the sentence...”reproducing in this way daily river flows”... to “in order to simulate daily river flows...”

Pg 5 Line 9: insert the word “a” before the word “computational”

Pg7 Line 10: change the word “hydrology models” to “hydrological models”

Pg8 Line 3: insert the abbreviation for Shuttle Radar Topography Mission. i.e. (SRTM)

Pg10 Line 8: change the sentence “...FDCs are a cumulative frequency...” to “...FDC’s are cumulative frequency plots...”.

Pg10 Line 14: change the sentence “We parameterized and evaluated the ED2+R formulation...” to “The ED2+R formulation was parameterized and evaluated for the...”

Pg10 Line 19: change the word “with” to “by”

Pg10 Line 21: change sentence “...a few meters above sea level in its confluence” to “...a few meters above sea level at its confluence”

Pg10 Line 31: change “range” to “ranges”

Pg10 Line 32: change “our model” to “the ED2+R model”

Pg12 Line 19: end the sentence after “sequentially” and start a new sentence. “...The calibration process...”

Pg14 Line 23: remove the word “up”

Pg15 Line 3 change the word “increases” to “improves”

Pg15 Line 28: change the word “largely” to “greatly”

Figure 6: it is difficult to distinguish the three “blue graphs” (i.e. I don’t know which graph belongs to which catchment). I suggest that you change the markers or line texture on the three “blue graphs” so that they are easily differentiated.