

Interactive comment on “Radiative forcing bias of surface albedo modifications linked to simulated forest cover changes at northern latitudes” by R. M. Bright et al.

R. L. H. Essery (Referee)

Richard.Essery@ed.ac.uk

Received and published: 12 January 2015

In discussing differences in surface albedo between forests and snow in open areas, Bright et al. present some interesting results on an important source of uncertainty for radiative forcings in climate models. The work will be worth publishing, but some improvements are required in the structure of the paper. This is an extremely compact paper with an enormous amount of supplementary material that is useful but does not compensate for deficiencies in the paper. Most of the problems can already be identified from statements in the abstract: - results “predicted by land surface schemes of six leading climate models” are not presented; the albedo parametrizations from

C8017

these schemes are used in isolation, and more information is required on how these parametrizations are run without including them in full land surface models - the emphasis of the paper is unclear. The statements that “the magnitude and sign of the albedo biases varied considerably for forests” and “RF bias was considerably small across models” are contradictory; the models cannot all have small biases if there is a considerable range in their biases. - no justification is given for the statement that “model improvement efforts of recent years are leading to enhanced LULCC climate predictions”

The meteorological data available (page 17342) do not include all of the variables or temporal resolution that would be required for running the full land surface models. How the albedo parametrizations from these models are run with the available data is not adequately explained in either the paper or the supplement. What is meant by “forest structure” in terms of model parameters needs to be explained in the paper, not just the supplement.

Minor corrections:

page 17340, line 19 “an order of magnitude spread”

17340, 24 Insert Boisier et al. (2012) reference here for LUCID

17341, 18 “intermodal spread”

17345, 21 “ $r = 1$ ” here looks like it refers to a correlation, but the correlation of what is not clear.

17345, 26 “positive biases occurred for the VIS band”

17346, 4 “at Open sites”

17349, 14 Table S4?

17350, 29 If “CC%” is referred to in the paper it needs to be explained in the paper, not just in the supplement.

C8018

17351, 18 “on the underlying datasets”

17352, 25 Replace the hyphen with a comma.

Figure 1 caption The data shown in (a) – (d) are observed and modelled albedos, not correlations between them.

Figure 2 caption (a) shows albedo differences, not albedo changes. The two rank scales and four NME scales on (b) are not explained in the caption.

Interactive comment on Biogeosciences Discuss., 11, 17339, 2014.