

Interactive comment on “Extended Application of the CNOP-P method in the Inner Mongolia using the Common Land Model” by B. Wang et al.

Anonymous Referee #1

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The paper describes the applications of an optimisation technique to a land surface model. The method is named conditional nonlinear optimal perturbation about parameters. The land surface model is the Community Land Model. While the paper has merits of applying the CNOP/P method to parameter optimisation that is very useful in complex models, there is a fundamental issue in the choice of parameter being the soil properties. These quantities are part of local physiography and they shall be observed or estimated, but not tuned as effective parameters. If sand and clay are chosen among the tuning parameters it could well be that they will end up compensating other errors in the model or in its uncertain parameters or again in the meteorological forcing. The conclusions on the importance of forcing is obvious and does not represent new insight in the field. I recommend more reflections on the choice of parameters to optimise among non/observable model parameters. The soil moisture results are not very

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convincing and I would recommend testing the method first with synthetic data in order to check the result of the optimisation in a case where the truth is known. The use of different forcing in order to argue on the importance of reliable meteorological input is quite essential because the soil could be tuned to compensate the lack of reliable precipitation forcing, and such compensatory tuning may hinder further progress.

Details: P4L44: Global worming...that is interesting and was worth checking wikipedia, which has an entry for "worming" ="moving with difficulty by crawling or wriggling"...I guess is Global warming that was meant here.

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