Earth Syst. Dynam. Discuss.,
https://doi.org/10.5194/esd-2019-81-RC3, 2020

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Interactive comment on "The Standardized Vertical Velocity Anomaly Index (SVVAI): Using Atmospheric Dynamical Anomalies to Simulate and Predict Meteorological Droughts" *by* Zhenchen Liu et al.

Anonymous Referee #3

Received and published: 5 July 2020

This manuscript discusses the dynamics of droughts over different climate regimes in China. The authors depart from the many typical drought studies that are based on surface indices, offering a new and refreshing approach based on atmospheric dynamical principles. They propose to use vertical velocity and convergence/divergence patterns to define two new drought indices. I find the concept exciting and promising.

The study uses global reanalysis data to assess the general behavior of the proposed index against the traditional approach of using SPI. Then, they employ long-term operational forecasts to evaluate whether the new indices contain a predictive signal, in

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Discussion paper

which case they could be used as a drought forecast tool.

The analysis is carried over several case studies and thus cannot offer a statistical significance. Some regions of China towards the east seem to respond consistently to the dynamical hypothesis, but this is not the case of droughts in other areas towards the west. The authors are honest and cautious about the possible limitations of the approach. In this reviewer's view, the study is a promising approach that has the potential to complement traditional drought studies. In that sense, I would not take the results as a definitive answer but as the starting point for other studies in this matter.

I would argue that the manuscript meets most of the review criteria for this journal, as defined in https://www.earth-system-dynamics.net/peer_review/review_criteria.html, with one exception. The manuscript is, in the most part, understandable despite limitations with the language and grammar. My suggestion to the authors is to get help from an editorial office or native English speaker that can review and help correct the grammar. They could also use software like Grammarly that helps detect and offer suggestions to many of the weakly formed sentences. Grammarly, and likely other equivalent software, offer subscribers additional support from an expert team at a fee.

My recommendation is that the manuscript should be published after those corrections. It would be a loss if poor grammar were used as the main factor to prevent publishing.

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