Natural Hazards and Earth System Sciences Discussions

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Comment on nhess-2021-214

Anonymous Referee #2

Referee comment on "Predicting drought and subsidence risks in France" by Arthur Charpentier et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2021-214-RC2, 2021

The article relates subsidence to shrinkage of clay happening from drought and long term precipitation deficit. While that is true, the clay shrinkage process relates back to groundwater withdrawal for fulfilling agricultural and urban demands during drought period. Even areas with high precipitation can subside if amount of precipitation is not sufficient to meet water need in an area. The article should clearly discuss how drought conditions increase groundwater demand and how groundwater withdrawal is affects clay layer causing subsidence.

The article should mention how water balance is represented in this research using combination of variable representative precipitation and soil moisture indices. The mechanism of land subsidence is related to the imbalance in hydrologic cycle. The predictor datasets used in the models are indices based mostly on precipitation and soil moisture. Evapotranspiration (ET) is an important component of the hydrologic cycle which has not been incorporated in these variables. ET strongly represents the water demand of an area. Therefore, an explanation on why ET was not added to the variables or how the used indices might fill the gap of ET should be mentioned in the article.

In tree-based method for number of claims prediction, no error metrices have been presented to represent each model performance compared to original observations. Same goes for cost predictions where no error metrices have been mentioned. In addition, a discussion can be added about among regression or tree-based models which one is better suited for such prediction. Future directions on how to make mnodel outputs more homogeneous to each other can be discussed. In colclusion, the methodology, result analaysis and uncertainty discussion are coherent. The paper shows some promising outcome and employs some useful techniques for subsidence risk modeling based on open source datasets.