

Peer-Review of "SMLFire1.0: a stochastic machine learning (SML) model for wildfire activity in the western United States"

Title: SMLFire1.0: a stochastic machine learning (SML) model for wildfire activity in the western United States

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Reviewed by Ye Liu, ye.liu@pnnl.gov

Summary

I would like to express my sincere gratitude to the authors for their efforts in fully addressing my comments and concerns regarding the manuscript. The revised version of the paper now includes substantial documentation of the novelty, particularly in comparison to the previous machine learning-based fire prediction approach. The authors have provided clear and compelling explanations for their predictor selection process, integrating important physical information into their approach. Furthermore, the consistent and thorough explanation of SHAP values is appreciated, as well as the potential impact of including correlated predictors in the model. Overall, the revisions have significantly improved the quality and impact of the manuscript. I wish to thank the authors for the opportunity to review their interesting work. It is a nice contribution to the field of climate-fire interaction. I just have a few minor technical comments that I hope the author can address before publication. Thus, my recommendation to GMD is to publish the work pending these technical corrections.

Minor Comments

1. **Line 7-8:** Is this relationship based on observation?
2. **Figure 1:** What test method and any threshold are used to define statically significant?
3. **Line 158:** Suggest change "urban" to "urban fraction" if the fraction is used.
4. **Line 159:** Suggest change to "..., Pop10_dist defined as ..."