

Geosci. Model Dev. Discuss., referee comment RC1  
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## **Comment on gmd-2021-81**

Anonymous Referee #1

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Referee comment on "Locating trees to mitigate outdoor radiant load of humans in urban areas using a metaheuristic hill-climbing algorithm – introducing TreePlanter v1.0" by Nils Wallenberg et al., Geosci. Model Dev. Discuss.,  
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The authors present a thorough description of their model – TreePlanter v1.0. Though the concept of modeling reduction in mean radiant temperature based on tree location is not entirely novel, their use of a metaheuristic approach speeds up computational time by avoiding a brute force approach, making their open source tool novel. Assumptions are clearly outlined and model limitations discussed.

The paper would benefit from expanded quantitative evidence/discussion of how each of the various model output surfaces compares spatially. Though they offer discussion/values of the temperature reduction potential of various runs, there is no evidence offered for the spatial comparison of model output beyond qualitative discussion of visual qualities of the surfaces (throughout) and the mention that tree/shadow size affects placement (Section 5). Discussion/comparisons of model output would be further substantiated with the inclusion of quantitative comparisons of the spatial qualities of the reduction in mean radiant temperature. How much area is reduced by how much? Is total overall reduction what is meant by line 11 in Figure 2 (Pseudocode) or is it something else? It should be elucidated in the body of the text and in figures. Include summary statistics and discussion of global/zonal/focal operations to highlight how these comparisons are made in the model and by the modeler. Inclusion of these comparisons throughout would clarify the description of this tool and substantiate the conclusions in the paper.

One additional minor point that may be worth expanding on is the discussion of model performance in real world settings v the study area (beginning on line 554) and throughout when “theoretically” is used to discuss alternative data and model parameters. Have any larger tests been run on real world scenarios? Have alternative

data sources been tested? How does the model perform? Adding some discussion of tests might clear up ambiguities around the real-world application of this tool.