Interactive comment on "A Spatiotemporal Weighted Regression Model (STWRv1.0) for Analyzing Local Non-stationarity in Space and Time" *by* Xiang Que et al.

Anonymous Referee #2

This paper proposes a new method named spatiotemporal weighted regression (STWR) to handle local non-stationarity in space and time. The underlying idea is interesting and meaningful and the model validation is also sufficient. Nonetheless, the method needs some more detailed explanation and discussion. My main concerns are as follows:

1. The main innovation of STWR is using the rate of value variation of the nearby observed point during the time interval to represent the time distance. However, the value variation between the estimated point and the observed points is not only influenced by the time variation but also the difference of geographical locations. How to distinguish

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whether this effect is caused by time or space? Further, the value variation not only occurs during the time but also occurs across space. Why not also consider the value variation across space?

2. The authors indicate that the current GTWR model directly calculates the integrated spatiotemporal weights by using a multiplication of the spatial and temporal weights, which may cause underestimation of weights. This is easily misunderstood. The GTWR model also uses a scale parameter to handle the difference between time and space, which is the same as the proposed STWR model. Please correct or give more explanation.

3. As new platforms and instruments have brought increasingly massive spatiotemporal data, deep learning and neural networks have also been integrated with geostatistical models to handle spatial and temporal non-stationary relationships, such as geographically neural network regression (GNNWR), geographically and temporally neural network regression (GTNNWR). These neural network-based models can even capture the complex non-linearity in the non-stationary relationship. Some discussion or comparison between STWR with these models should be added.