

## ***Interactive comment on “UFlow 1.0: A Computer Model for Projections of Urban Sprawl” by André Koscianski***

**Anonymous Referee #2**

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Report on “UFlow 1.0: A Computer Model for Projections of Urban Sprawl” by Andre Koscianski

The author proposes an urban growth model based on a heat equation spatial-explicitly predicting which raster cells convert to urban. The approach is illustrated by means of an artificial setting as well as the two case-studies Ponta Grossa and Mexico City. The model to some extent correctly predicts historically observed urban growth.

The work seems relevant and might have the potential to be of interest for the specialized community.

However, I cannot recommend publication of the manuscript in the present form. The main reason is incomprehensible presentation. One can hardly understand how the

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model works and only guess. Accordingly, the manuscript is lacking a clear description and presentation of the model. What often helps is a step-by-step receipt. I recommend a complete work-over, in particular of the model description.

As the weakness is rather fundamental, it is hard to point out specific problems. Nevertheless, I hope the following details give a hint.

- please provide page of Jacobs-quote (l.24-26) - do not say "very transparent" (l.61), as it is a subjective - all captions are too brief - Eq.(1) seems wrong, ie the set of parameters is equal to the distance metric. I think I understand what the author tries to say, but mathematically it seems wrong. - l.133: one should also distinguish between endogeneous and exogeneous growth - Eq.(3) is not an equation - sort appendices (first to be mentioned is Appendix C) - Fig.3 not clear, what is the temperature? - l.238: what does the superscript "plus" mean? - l.240-250: not clear - l.256: how do new clusters emerge? - l.260: spraying procedure not explained properly? - l.277: what is the distance transform  $\delta$ ? - l.283: what is  $g$  in the exponential? - Algorithm 2: what kind of rectangle? - Fig.6(b) not discussed, skip? - only 1-2 sentences about Fig.8. Either discuss or skip. - computation time (l.345) is not really comparable, because computational power is unknown - maps: scale-bars are missing! - maps: how about surrounding cities/settlements? - why only 2 panels in Fig.10 instead of 3 in Fig.6? consistency! - axis labels of Fig.8 and 12?

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Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2019-317, 2020.

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