Reproducibility and Replicability of Flood Models – A Discussion

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Abstract

Flooding is a frequent disaster that has a wide-spread footprint globally with significant financial and societal impacts. With availability of Earth observation data from private and public entities at varying spatial, temporal, and spectral resolution as well as data from crowdsourcing, there is no shortage of models. In fact, models and algorithms are abundant and proliferating. However, the question remains *where is a global flood model when we need one?* Just because models are available does not mean they are usable or accessible and adequate for emergency managers, first responders and other stakeholders who use the model outputs for preparedness, response and resource planning. Often the issue of usability stems from the fact that the models are not always *reproducible or replicable*. The accuracy and uncertainty associated with the models and how they change based on the scale of analysis and the resolution of input and output datasets are often not communicated properly to stakeholders so they can be part of their decision-making process. The proliferation of machine learning and data driven models that rely on historical data also adds to this problem. This paper discusses several important issues associated with global flood models and provides recommendations that could be used to increase the usability of these models.

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