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Moving towards a Global Flood Model Validation Framework

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In recent years, a range of global flood models (GFMs) was developed, each utilizing different process descriptions (for instance for routing) as well as validation data sets and methods. To quantify the magnitude of these differences, previous studies have assessed the performance of GFMs on the continental and catchment level. Since the default model set-ups resulted in locally marked deviations, there is a clear need for further and especially more standardized research to not only maintain credibility, but also support the application of GFM products by end-users.

Consequently, we here outline the basic requirements and challenges of a Global Flood Model Validation Framework for more standardized model validation and benchmarking in the hope of encouraging the much needed debate, research developments in this direction, and involvement of science with end-users. By means of the framework, it is possible to streamline the data sets used for input and validation as well as the validation approach itself. By subjecting GFMs to more thorough and standardized methods, we think their quality as well as acceptance will increase as a result, especially amongst end-users of their outputs. Otherwise GFMs may only serve a purely scientific purpose of continued model improvement but without being actionable.

Furthermore, GFMs should become more integratable which would allow for representation of more physical processes and even more detailed comparison on a model component basis. We think this is pivotal to not only improve the accuracy of model input data sets, but to focus on the core of each model, the process descriptions. Only if we know more about why GFMs deviate, are we able to improve them accordingly and develop a next generation of models, not only providing first-order estimates of flood extent but supporting the global disaster risk reduction community with more physically-robust, accurate, and actionable information.