

## Case description - Can we really predict floods?

We (Schalk Jan and Maurizio) are a couple of enthusiast researchers at [IHE Delft](#) which have dealt with flood issues in that last years.

Schalk Jan van Andel is a Senior Lecturer in Hydroinformatics. He has a background in Hydrology, Computational Hydraulics and Water Management. His main research interests include Anticipatory Water Management and Flood Forecasting, Early Warning and Control. He has been involved in national and international research projects for the design of innovative real-time flood forecasting early warning system tools and flood risk reduction measures. Among the projects he has been. Case studies include Upper-Blue Nile and Awash rivers in Ethiopia, and Ganges river in Bangladesh.

Maurizio Mazzoleni he recently joined the chair group of Hydroinformatics. His research activities are related to the implementation of advanced data assimilation tools for improving flood prediction. In his PhD research he studied the use of water level observations from citizen as alternative source of information in case of scarce data. He has been involved in different European projects.

### Case

A warmer climate would increase the probability of flooding and the consequent damage on urbanized area. The increasing flood risk levels will push more people (temporarily) living away from the flood-plain areas or even from flood-prone areas. In this optic of climate change, it is fundamental to proper forecast possible flood events. However, this raises other important issues:

- Were the flood forecasting tools developed in the last years able to proper predict past flood event?
- Which river floods world-wide in the past 5 years were forecasted, and which were not?

Floods and their sometimes life-threatening consequences seem to appear in news about every week. Many water experts, researchers, consultants, and managers alike, work hard on developing and operationalising reliable flood forecasts. These forecasts aim to identify the chance of a flood event to happen, for example three days in advance, to allow sufficient time for counter-measures to become effective or for evacuation.

Publications on the forecast skill of a particular flood forecasting system appear regularly in the scientific journals, but these often focus on comparing 2 or 3 forecasting methods or on a specific river. To allow for comparison, the results are presented in statistical scores with not very intuitive names such as "Brier Skill Score" or "Continuous Ranked Probability Skill Score". And lastly, the performance of the forecasts is usually measured against observations of model results of river discharge, not against whether a flood really happened or not. While these publications help in improving the forecasting methods, they do not provide a clear overview on where we stand today, worldwide, in forecasting floods.

**We, therefore, challenge you to dive into the news of the past 5 years and find 50 river floods (or as close to that many as possible) and find out for each of these floods if it was forecasted and if yes, how many days in advance. In addition, we challenge you to prove and show if flood events are really increasing in the last 5 years.**

This information will be used to understand how reliable are the current forecasting tools in properly predicting flood events and how this situation can be improved within a rapidly changing environment which will experience more sever flood in the coming years.