

Safe rivers – is it possible – or not?

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ABSTRACT

Over the last decades we have experienced severe and disastrous consequences of hydrological extremes. Floods and landslides that have caused loss of many lives, enormous damages of properties and infrastructure and huge personal and societal costs.

“Hans” is the most recent extreme event in Norway, but in the last few years we have experienced several local flash flood events that have not been as well predicted and prepared for “Hans”. Is it at all possible to protect ourselves against these?

Do we have the tool to predict the cause and consequence of extremely local and intense flash floods? If we have a precise meteorological forecast our hydrological models are able to tell us that we will get a flood in the rivers in the region on green, yellow or red level. As most of our rivers do not have gauged timeseries the size of the flood must be related to the closest monitored river which usually is one of the larger rivers in the region. A river that probably not at all will respond to a local rain event. So even if we had precise local meteorological forecasts of extreme rain events would we be able to transform these into a specific warning at yellow or red level for small, ungauged rivers? In that case we have solved the cause issue, but it is not enough to tell that we know something will happen if we do not know where it will cause problems. The majority of Norwegian municipalities neither have the experience nor the tools to know what the consequences might be. Our hydrological models might tell us how many m³/s we can expect, but not if this causes serious flooding somewhere or high water velocities eroding away roads or houses or rivers taking new direction. It does not tell the municipalities where they should focus their efforts before and during the event.

Consequence based warnings are a step in the right direction, and we need to both develop the competency to understand the consequences and the tools to predict were, what and when they are likely to get challenges and finally how to communicate this to those that have to make the right decisions “on the fly”.”

