



Fews-Risk: A step towards risk-based flood forecasting

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Operational flood prediction and the assessment of flood risk are important components of flood management. Currently, the model-based prediction of discharge and/or water level in a river is common practice for operational flood forecasting. Based on the prediction of these values decisions about specific emergency measures are made within operational flood management. However, the information provided for decision support is restricted to pure hydrological or hydraulic aspects of a flood. Information about weak sections within the flood defences, flood prone areas and assets at risk in the protected areas are rarely used in a model-based flood forecasting system. This information is often available for strategic planning, but is not in an appropriate format for operational purposes.

The idea of FEWS-Risk is the extension of existing flood forecasting systems with elements of strategic flood risk analysis, such as probabilistic failure analysis, two dimensional flood spreading simulation and the analysis of flood impacts and consequences. Thus, additional information is provided to the decision makers, such as:

- Location, timing and probability of failure of defined sections of the flood defence line;
- Flood spreading, extent and hydraulic values in the hinterland caused by an overflow or a breach flow
- Impacts and consequences in case of flooding in the protected areas, such as injuries or casualties and/or damages to critical infrastructure or economy.

In contrast with purely hydraulic-based operational information, these additional data focus upon decision support for answering crucial questions within an operational flood forecasting framework, such as:

- Where should I reinforce my flood defence system?
- What type of action can I take to mend a weak spot in my flood defences?
- What are the consequences of a breach?
- Which areas should I evacuate first?

This presentation outlines the additional required workflows towards risk-based flood forecasting systems. In a cooperation between HR Wallingford and Deltares, the extended workflows are being integrated into the Delft-FEWS software system. Delft-FEWS provides modules for managing the data handling and forecasting process. Results of a pilot study that demonstrates the new tools are presented. The value of the newly generated information for decision support during a flood event is discussed.