

## **The VNK2-project: a fully probabilistic risk analysis for all major levee systems in the Netherlands**

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**Abstract** Quantitative risk analysis is a powerful tool for assessing flood risks. The VNK2-project is a large-scale, fully probabilistic risk analysis for the low-lying parts of the Netherlands. It started in 2006 and draws upon decades of research and development. Flood probabilities are quantified in a Bayesian framework, taking into account the uncertainties related to loading conditions, the strength of flood defences, the outcomes of physical models, and the human factor. Economic and fatality risks are considered. These are expressed in various forms, ranging from population-averaged values to individual exposures. The project's results can be used to evaluate alternatives for reducing risks, inform the political debate about new safety standards, prioritize interventions, and (re)direct research efforts to reduce important sources of uncertainty.

**Key words** flood risk; VNK2; quantitative risk analysis