



Low Probability Design Flood Estimation by a "Multi pillar"-Approach

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The occurrence of extreme floods in the past years has stimulated new interest in methods to estimate floods of low recurrence probability. In this paper a design flood estimation methodology is proposed which builds on a multi method or "multi pillar"-approach applying several methods in parallel. The rationale behind this concept is guided by the fact that the various methods applied use different kinds of data, consider different types of information, and are characterised by different sources of uncertainties. Combining estimates derived from these different methods should reduce the uncertainty in the design value.

The proposed methodology is demonstrated by an example where probabilistic and deterministic approaches are combined to derive an estimate for a 5000-year flood in a small drainage basin. The methods included comprise: (i) at site (local) and (ii) regional flood frequency analysis, (iii) rainfall runoff modelling, (iv) Gradex methodology, (v) envelope curve analysis. The uncertainties involved and the means of weighting these uncertainties are discussed.