



Modelling Group  
WATER NEW ZEALAND



## **TITLE**

The National Flood Studies Programme for South Africa: Overview and Developments to Date

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## **ABSTRACT**

Floods have an impact on human survival, economic development and environmental sustainability through loss of life and significant economic loss as a consequence of the failure of structures (e.g. dams and culverts). Estimates of design floods are required for the design of hydraulic structures and to quantify the risk of failure of the structures. Information on flooding is also essential for the development of safe human settlements, particularly in low lying areas.

Historical records of floods are used to both directly estimate design floods from the observed gauged data and to develop methods to estimate the design floods at ungauged sites. The longer the period of available gauged flow data, the more reliable the design floods and methods. Most of the methods currently used for design flood estimation in South Africa were developed in the late 1960s and early 1970s and are in need of updating with more than 40 years of additional data currently available and with new approaches used internationally. In addition, climate change is expected to influence the magnitude and frequency of flooding, and hence this increased variability in flows need to be accounted for when determining flood risk.

Given the above, the South African National Committee on Large Dams identified the urgent need to update the data and methods used for design flood estimation in South Africa and, in conjunction with the Water Research Commission, initiated a National Flood Studies Programme (NFSP) to update these. This paper will briefly summarise the performance of empirical, event-based deterministic and regional approaches currently used in South Africa and will provide an overview of new developments to date. This will include updates to design rainfall and probable maximum precipitation estimation, the identification and recommendation of the best probability distribution to use in flood frequency analyses, the development of regional quantile regression and index flood approaches, the determination of locally derived Curve Numbers for the SCS model using both observed and simulated flows, uncertainty assessment using an ensemble approach for the SCS-SA model, impacts of climate change, and the development of a continuous simulation approach to design flood estimation on a national scale.



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### **Keywords**

Design flood estimation, South Africa, uncertainty estimation, regional approaches, climate change



### Declaration

Topic	Choose an item.
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## Abstract Guidelines

1. Abstract Guidelines
  - Abstracts submitted must be between 300 – 500 words, excluding title and authors.
  - Abstracts must use the template above
  - Font used should be Times New Roman or Arial size 11.
  
2. Call for Abstracts closes 4pm, Tuesday 31<sup>st</sup> January 2023 and submitted to [Katrina Guy](#)
  
3. Abstract Selection
  - Wider applicability
  - Demonstrated results and conclusions
  - Relevance to the current state of the industry
  - Content, including innovation
  - Clarity and quality
  
4. Abstract Acceptance
  - If accepted into the programme, you will only have to submit a presentation. No paper is required.
  - Final presentation will be due by **28<sup>th</sup> February 2023**
  
5. Presentation
  - Powerpoint 16:9
  - Slide Pack will be attached shortly