



Implementing NaFSAT: Building a Community of Practice for Improved Design Flood Estimation in South Africa

South Africa faces increasing flood risks, yet many practitioners continue to rely on design flood estimation methods developed decades ago. The National Flood Studies Application Tool (NaFSAT), developed through the National Flood Studies Programme (NFSP), provides a modern, QGIS-based platform that integrates a suite of contemporary rainfall and flood estimation methods, catchment analysis tools, and supporting datasets into a single user-friendly environment. NaFSAT has been developed to promote more consistent, transparent, and scientifically defensible flood assessments across the country. During this IMESA/WRC workshop, participants will be introduced to the tool, its key applications, and the ongoing national rollout programme. The session will include a live demonstration of NaFSAT and provide an opportunity for practitioners to engage with the development team and contribute feedback that will support its broader adoption within the South African water and municipal engineering sectors.

The workshop is free to attend and is intended for municipal engineers, consultants, researchers, students, and other practitioners involved in flood hydrology, stormwater management, and water resources planning.

Proposed Agenda

Time	Topic
00:00 - 00:10	Welcome, introductions and workshop objectives
00:10 - 00:25	The National Flood Studies Programme (NFSP): Why South Africa needs modern DFE approaches
00:25 - 00:40	Introduction to NaFSAT Version 1: Vision, development journey and capabilities
00:40 - 01:00	Demonstration 1: Design Rainfall Estimation, PMP and ARF Tools
01:00 - 01:25	Demonstration 2: Regional Flood Estimation Tools (RMF, Index Flood, PRM and QRT)
01:25 - 01:45	Demonstration 3: Catchment Delineation, Data Extraction and Supporting Workflows
01:45 - 01:50	Future Development, National Roll-out and Community of Practice
01:50 - 02:00	Discussion, Feedback and Closing Remarks



Potential Images



NaFSAT Workshop at IMESA 2026

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Water Research Commission logo

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NFSP Version 1.0 Workshop: 27 October 2026

1-Day Probable Maximum Precipitation Extraction Tool (Polygon Average)

Parameters

Log

Catchment Name - Enter your desired catchment name

PMP Catchment Test

Polygon Boundary

Example Boundary- Polygon Average [EPSG:4326]

Average 1-day Probable Maximum Precipitation Extraction Tool Spreadsheet Summary

Save to temporary file

Average 1-day Probable Maximum Precipitation Extraction Tool Vector Layer Detailed

Create temporary layer

☒ Open output file after running algorithm

0%

Advanced

Run as Batch Process...

Run

Close

1-day Probable Maximum Precipitation Extraction Tool (Polygon Average)

Calculates the average 1-day PMP for a given boundary. A meteorological estimate representing the theoretical physical upper limit of rainfall depth for a given duration and location, used to calculate extreme design floods for high-risk structures.

Outputs

Average 1-day Probable Maximum Precipitation Extraction Tool Spreadsheet Summary
A spreadsheet output containing summarised 1-day PMP values

Average 1-day Probable Maximum Precipitation Extraction Tool Vector Layer Detailed
A shapefile output containing detailed 1-day PMP values

Algorithm author: GroundTruth
Algorithm version: 2.0



Regional Maximum Flood Estimation Tool_23

Parameters Log

Catchment Boundary: Select a previously delineated catchment boundary layer

Example Boundary [EPSG:3857]

RMF Outlet Point (Within Boundary)

3321280.348192,-3449102.358624 [EPSG:3857]

Regional Maximum Flood_detailed output

[Create temporary layer]

☒ Open output file after running algorithm

Regional Maximum Flood_summary output_spreadsheet

[Save to temporary file]

0%

Advanced Run as Batch Process...

Run Cancel Close

Regional Maximum Flood Estimation Tool_23

An empirical method that estimates the upper limit of expected flood peaks by using an envelope of the maximum observed floods within hydrologically similar regions.

Input parameters

RMF Outlet Point (Within Boundary)

Select your catchment outlet point on the map

Outputs

Regional Maximum Flood_detailed output

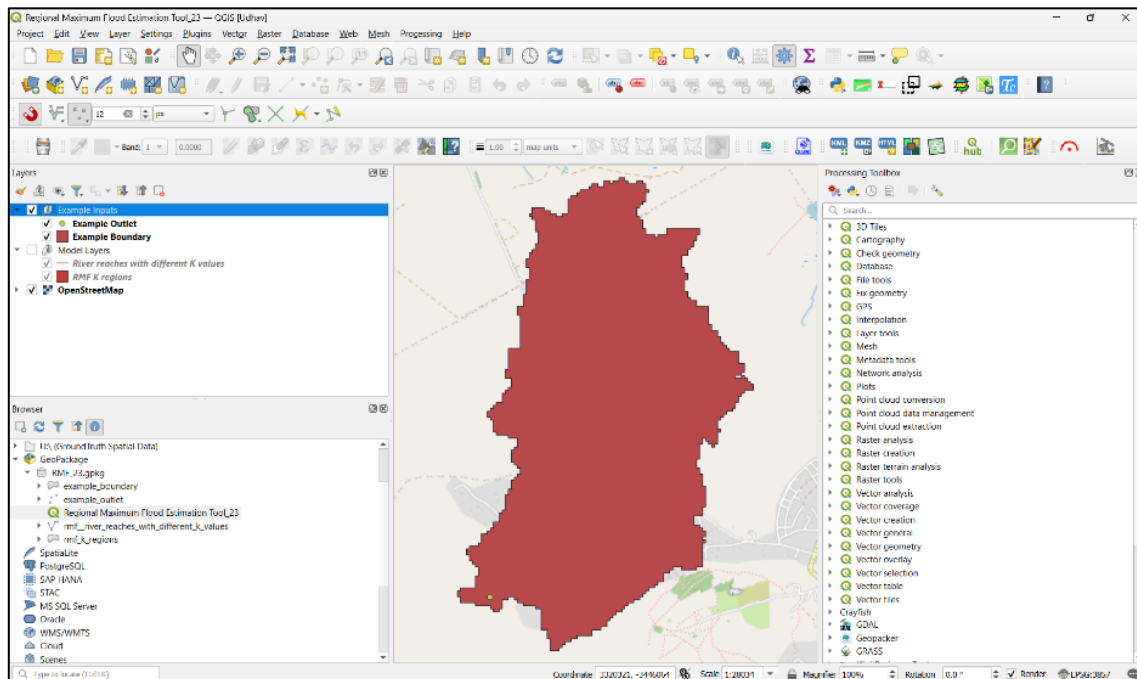
Shapefile output with detailed RMF values

Regional Maximum Flood_summary output_spreadsheet

Spreadsheet output with summarised RMF values

Algorithm author: GroundTruth

Algorithm version: 2.0





NaFSAT Version 1.0 User Guide

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NaFSAT/13072026/02

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