OVERBERG GEOSCIENTISTS GROUP (OGG)

(OGG – Reg. No. 275-138 NPO)

The Klein River and Stanford Flood of September 2023 - Risk assessment, mitigation and early warning

Malcolm Lee, Chris James & Stuart Dunsmore

Thursday 6 November, 2025, Onrus Manor Breakfast Meeting & Zoom presentation

In the final week of September 2023, a cut-off low-pressure weather system moved inland of the towns of Hermanus and Stanford in the southern Cape, causing exceptionally heavy rainfall and strong winds from late-Sunday 24th into Monday-morning 25th September, 2023. This system caused extreme flooding of the Onrus and Klein Rivers, whose headwaters originate at the base of Babylonstoren Mountain in the upper Hemel & Aarde Valley.

The Bot River to the north-west of Hermanus also experienced severe flooding, causing considerable damage and destruction to part of the N2 Highway, and loss of life as a consequence of a vehicle being swept off the N2.

These systems are not uncommon in the Western Cape during the winter months. They are often noted out to sea where they cause less damage, than is the case when they intensify and stall over land areas, as was the case in the southern Cape in late September 2023.

Early Monday morning, 25 September, the NSRI Hermanus and Kleinmond mobilised resources and joined several other Emergency Groups (e.g. SA Police Services, Community Policing Forum, Disaster Risk Management, Western Cape Government Health EMS and others) to evacuate residents adjacent to the Klein River, in Stanford and parts of Hermanus and the Overberg.

In Stanford, considerable flood damage was done to buildings, property, roads and infrastructure during the extremely heavy downpours through Sunday evening and associated flooding into daybreak of Monday 25 September. At least 46 residents, including adults, the elderly and children, a parrot and domestic animals, were safely evacuated from homes and buildings affected by the Klein River that burst its banks (see images that follow)

The presentation by Malcolm Lee, Chris James and Stuart Dunsmore (see details below) describes the effects of the flood on the residential parts of Stanford and the results of their extensive investigations of the September 2023 flood-related issues. These include statistical analyses of rainfall records to estimate the likelihood of similar events occurring in the future, computer simulations of the movement of floodwater to explore possible flood mitigation measures, and setting up an early warning system to allow rapid disaster management responses.

Malcolm Lee is a graduate of Rhodes University (Grahamstown) with more than 35 years experience in exploration and exploitation of mainly carbonate rock for purposes of cement, lime and aggregate production. His experience within South Africa, SADEC, DRC, Ethiopia and Algeria ranges from mineral target identification, grass-roots exploration, resource modelling

and estimation, mine design and planning, drafting of EMPRs, Codes of Practice, Mine Closure and estimation of mine closure financial provisions.

Chris James is a Professor Emeritus in the School of Civil & Environmental Engineering at Wits University where he taught hydrology and hydraulics and carried out research in river hydraulics, sedimentation, hydraulic structures and environmental flows. At Wits he was also co-director of the interdisciplinary Centre for Water in the Environment, involved in studies of the interaction of hydrology, hydraulics and ecology in natural aquatic systems.

Stuart Dunsmore, educated at the University of Natal, is a Chartered Engineer and hydrologist with over 37 years of international experience in flood risk management, climate adaptation, and sustainable water solutions. He has led major projects across Africa, the UK, and Caribbean, specialising in flood hydrology, hydraulic modelling, and nature-based solutions. Stuart has contributed to national design flood guidelines, advised the World Bank and GFDRR on climate-resilient infrastructure, integrates engineering and environmental planning to reduce disaster risk, support resilient development, particularly in vulnerable urban and riverine systems.

Klein River in flood at Stanford – 23 September 2025

Flooding in the small Town of Stanford – 23 September, 2023

Flooding of a home in Stanford

Bot River destruction of N2 Highway near small town of Bot Rivier (Source: Overstrand Municipality)

Information Sources:

Naidoo, J. (2023). Journalist and his wife in near death experience during Western Cape storm. *IOL (Information on Line), 26 September, 2023*

NSRI. (2023). Flood Assistance in the Western Cape; RESCUES. *National Sea Rescue Institute, 26 SEPTEMBER 2023.*