

Are rainfall intensities changing, could climate change be blamed and what could be the impact for hydrologists?

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Abstract

The climate of the world varies from one decade to another, and a changing climate is natural and expected. The rapid human industrial development experienced since the early 1800s, may well have caused variations that exceed natural cyclic changes. Climate change can be defined as the natural cycle through which the earth and its atmosphere are going to accommodate the change in the amount of energy received from the sun.

Amongst other duties, engineering hydrologists are responsible for the determination of peak stormwater discharges to be able to size conduits to safely convey this water for given recurrence interval events. All hydrological predictions are indirectly or directly based on historical data. Empirical formulas and deterministic methods were developed and calibrated from known historical data. Statistical predictions are directly based on actual data. The question that arises is whether the historical data would still provide an accurate basis from which possible future events can be predicted?

Detailed analyses of 42 years of useable rainfall data at the Molteno rainfall station in the Western Cape at the foot of Table Mountain were carried out to address this question. The finding indicates that tendencies beyond the variation expected from natural climatic cycles have already been recorded at the Molteno rainfall station. This phenomenon could be as a result of the enhanced greenhouse effect. Notwithstanding the localised nature of this study, the study points to changing rainfall trends that have already been experienced, and the trend of these changes underlines the prediction that less, but more intense rainfall could be expected in the Western Cape.

Keywords: Climate change, rainfall, intensity, trend, design principles, greenhouse effect