

# Research Directions

Office of Research Services

## *Designing for Stormy Weather*

**Dr Ataur Rahman from the School of Engineering is collaborating with engineering and project delivery firm Sinclair Knight Merz to analyse storm patterns for use in designing infrastructure in the Gold Coast area of Queensland.**

'Due to climate change, the frequency and severity of flooding will increase in the near future and many existing water infrastructures will be unable to cope with these changes' says Dr Rahman. Flood estimation models are used to estimate the capacity of hydraulic and water control structures such as dams, weirs and local government infrastructure such as storm water management and drainage systems but these are currently based on old data.'



In particular, the distribution of rainfall intensity over its duration (called temporal pattern of storms) is an important element in flood estimation models. The current design temporal patterns used in Australia were derived 20 years ago, and may not be appropriate for current trends in climate change. Use of inappropriate temporal patterns can have a significant impact on project costs of building water infrastructure, as well as associated risk of failure due to under-estimation of flooding effects.

In a previous UWS study of rainfall patterns in the Gold Coast region, Dr Rahman and colleagues used data from 22 rainfall measurement stations to analyse rainfall patterns over the past 31 years, allowing them to estimate design temporal patterns up to three days duration and make design flow predictions that were superior to previous methods. This project will extend these modelling principles to storms of four and five day's duration, to further improve the efficiency of large hydraulic structures.

The results of this project will allow engineers to make more accurate design of hydraulic structures that will result in smaller flood damage. Designing and building these structures will therefore be more cost effective, and safety and long-term integrity will be increased, thus providing peace of mind for both designers and the community living around the structures.

**Project Title:** Development of temporal patterns of storms greater than 72 hours for the Hinze Dam stage 3 Project

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