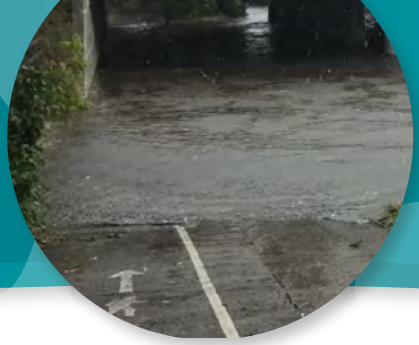
CRC for
Water Sensitive Cities



Program B: Water Sensitive Urbanism | Project B1.3 | Project duration: July 2014 - December 2016

Impact of climate change on extreme rainfall and drainage design

Overview

In the study of climate change, rainfall projections on the time scale of minutes are of particular interest to Singapore's Public Utilities Board (PUB) to support its climate change adaptation plans for drainage infrastructure. However, due to limitations in the global scale general circulation models (GCMs) and regional climate models (RCMs), rainfall projections at such high temporal resolution are not readily available.

This project will use an innovative weather regime-dependent stochastic model to fill this gap. The model will be able to be used by the National Environment Agency-Centre for Climate Research Singapore (NEA-CCRS) for high resolution regional modelling for future climate projection works.

The objectives of the project are to:

- identify the key weather regimes in Singapore
- downscale climate projections from GCM/RCM to produce future rainfall projections of sufficiently high resolution to improve the accuracy of modelling and flood mapping.

Key outcomes

The project will identify the key weather regimes in Singapore, with data being compared to climate projections being developed by the NEA-CCRS to generate rainfall projections on a small scale.

The data produced will also help determine the likely shift in Intensity-Duration- Frequency (IDF) curves for future time periods.

The rainfall projections and changes in short-duration rainfall intensities can be used by PUB to generate flood maps to study the impact of climate change on the adequacy of drainage infrastructure.

Australian Government
Department of Industry, Innovation and Science
Business Cooperative Research Centres Programme

Outlook

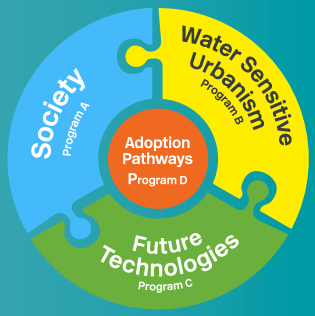
1. A series of weather regimes for Singapore/Identification of weather regimes. This will be carried out by staff from the NEA-CCRS using techniques developed in the Cooperative Research Centre for Water Sensitive Cities (CRCWSC). This task has been completed.

2. A validated stochastic model for rainfall in Singapore:
   (i) Dr Bhupendra Raut (CRCWSC) will oversee the implementation of the current version of the stochastic model in Singapore. This will be done in collaboration with staff from the NEA-CCRS. (ii) Further work will be done to improve the temporal downscaling.
   (iii) The downscaling will be validated against Australian radar data and the code made available to the NEA-CCRS.

   Deliverable: A validated version of the stochastic model (model code) to downscale the rainfall projections for Singapore.

3. Rainfall projections for Singapore/Integration of stochastic model and RCM outputs.

   Deliverable: Rainfall projections for Singapore at 1 km-scale, 10-min resolution, with uncertainty range: approximately 1000 scenarios (data).



About the Cooperative Research Centre for Water Sensitive Cities

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) brings together interdisciplinary research expertise and thought-leadership from Australia and the world to address current urban water management challenges facing our cities and regions. In collaboration with over 80 research, government and industry partners, it develops and synthesises knowledge into powerful tools and influences key players aiming to achieve sustainable, resilient and liveable water sensitive cities.

Further information

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