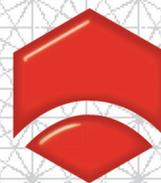# Water Engineering Panel

Technical Presentation

Student Honours Thesis Presentations

ENGINEERS AUSTRALIA

VENUE

Aerial Function Centre UTS

DATE & TIME

Wed 30 April 2014 | 5:30pm
Refreshments for 6pm start

CPD

Eligible for 1.5 hours CPD

COST

Free

RSVP

REGISTER ONLINE

Dan Morgan and Zhe Liu will be presenting their Honours Thesis in the field of water engineering.

Dan Morgan – Application of Soil Water Balance Model (SWMOD) to Gauged Catchments in NSW

SWMOD is a distributed storage capacity loss model and was developed in 1989 by the Water Authority of Western Australia. It is an established method of rainfall loss estimation in south western WA. It is also theoretically possible to characterise this type of model anywhere in Australia using national soil maps. Today this type of model has extremely limited use in NSW and its suitability remains unknown.

This project will test SWMOD on several NSW gauged catchments where the conventional Initial Loss Continuing Loss (ILCL) model has been applied. The selected catchments will include some where the traditional ILCL model performed well and some where it has proved problematic. The project will be testing:

- The ability to set up SWMOD
- The performance of SWMOD against historical events
- If depth of runoff is maintained when using SMWOD
- The ability to reproduce a recorded event using SWMOD
- The ability to predict a design flow using SWMOD

The flood hydrographs from each catchment that result from the use of the SWMOD will be compared with the existing flood hydrographs for each catchment and the hydrographs that have resulted from the use of the ILCL model. The models will be compared and conclusions will be drawn based on peak flow and four hydrograph characteristics:

- Shape
- Timing
- Peak
- Volume

Dan graduated from the University of Technology, Sydney in 2013 with a BE (Hons) Civil/Environmental Major and Diploma in Engineering Practice. Dan has been employed at WMAwater since June 2012 where he has assisted in a number of Flood Studies and Floodplain Risk Management Studies across NSW..

Zhe Liu – A New Method for Verification of Delineated Channel Networks

Several methods are used to delineate channel networks. The most widely used are the contributing area method, area–slope method, and grid network ordering method. The number of delineated channels depends on the threshold adopted when using each method. However, the appropriate threshold value required to delineate channel networks, and their corresponding accuracies, are still uncertain.

The consistency between the delineated channels and actual channels can be evaluated by carrying out extensive field surveys, but these require significant time and cost. Accurate knowledge of delineated channel networks is vital, and is achievable more efficiently and simply. A new method of calculating the accuracy of delineated channel networks is introduced in this study. Channel cross-section profiles throughout the channel network were examined and three new incision indices were derived: an incised channel index, a partially incised channel index, and a non-incised channel index. The indices were found useful for setting appropriate threshold values for actual channel networks. Three small catchments in Wellington, New South Wales (NSW), Australia, were investigated in this study.

For further information contact Monique Retallick

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