Water Engineering Panel

Technical Presentation

Student 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, Jayden Liu and Lisa Pomeroy will be presenting their 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, recommended in ARR Project 6, 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, and The ability to predict a design flow using SWMOD.

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.

Jayden 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.

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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.

Jayden recently graduated from the University of New South Wales (2013) with a BE (hons) in Civil Engineering.

Lisa Pomeroy - Estimation of Impervious Area for a Victorian Urban Catchment

There is great concern in Australia surrounding the effects of increased impervious areas resulting from urban development. With urban planning placing increased pressure on water sensitive urban design and increased runoff water volumes, the need to estimate imperviousness has become vital. Effective Impervious Area (EIA) is considered to provide a more realistic and representative estimation of the impervious area generating runoff. It is commonly estimated by means of the statistical technique of regression analysis using the rainfall and runoff data for the study area. Impervious area which connects directly to the drainage network is commonly termed Directly Connected Impervious Area (DCIA). It is commonly estimated through the use of aerial photographs and visual analysis. This study estimated the Effective Impervious Area (EIA) for the Kinkora Road Retarding Basin Catchment in Blackburn, Australia, and sought to determine if the estimation of Directly Connected Impervious Area (DCIA) is consistent with the estimate of EIA.

Lisa graduated from the University of Melbourne with a Bachelor of Environments (Civil Systems) and has since completed her Master of Engineering (Civil). Lisa has been employed at Cardno since 2011, where she has been involved in coastal, rural and urban flood mapping and mitigation projects. Lisa has been directly involved with the update of the Australian Rainfall and Runoff guidelines, where she has contributed to Project 6 which focuses on reviewing the currents loss model guidelines for design flood estimation and providing recommendations for updates.

For further information contact Monique Retallick

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