

Talk on “The Development of a Radar Rainfall Processing Tool for Malaysia”

CONSULTING ENGINEERING SPECIAL INTEREST GROUP



by Ir. Dr Ooi Teik Aun

THE talk on “The Development of a Radar Rainfall Processing Tool (RAIM) for Malaysia” was delivered by Dr James Lau, Principal Engineer at Black and Veatch United Kingdom on 23 September 2010 at the Prof. Chin Fung Kee Auditorium at Wisma IEM, Petaling Jaya, at 5.30 p.m. (see Figure 1). The talk was attended by more than 40 participants (see Figure 2).

Dr Lau is an expert in spatial rainfall technology, having successfully developed radar/rainfall tools for the UK Met Office and the Malaysian Government. He also has expertise in climate change analysis for wastewater networks and has developed methodologies to account for climate change sensitivity testing for Anglian Water. He has

experience in computational modelling of marine waters, urban drainage systems, wastewater treatment plants and receiving water systems. He is also an expert in using Geographical Information Systems. His research work includes flood forecasting, climate change, the modelling of integrated Urban Wastewater Systems, the application of optimisation theory, financial modelling and the use of receiving water quality objectives.

Dr Lau is here on an Irrigation and Drainage Malaysia (DID) assignment under Black and Veatch, in partnership with Dr Nik and Associates Sdn Bhd (DNASB), on the Atmospheric Model-Based Rainfall and Flood Forecasting (AMRFF) system. The system involves the development and use of a regional climate model for rainfall prediction and climate control. The system also uses radar/spatial rainfall estimates to provide rainfall estimates over large areas and to update rainfall predictions.

Black and Veatch is providing the system to process radar rainfall data into rainfall estimates. This system, known as RAIM (Radar Rainfall and Integrator for Malaysia), will provide spatial rainfall estimates. The process of transforming radar readings to rainfall rates is generally known as Quantitative Precipitation Estimation (QPE). The conversion process is complex as it requires a combination of geographic manipulation, empirical relationships and image correction techniques to provide reliable rainfall estimates. DNASB has been testing the use of the data in river modelling.

Figures 3 and 4 show the radar reflectivity energy scan and radar data converted to gridded rainfall estimates respectively. According to Dr Lau, “This is a wonderful opportunity to demonstrate the ability of this state-of-the-art technology for clients. Working in partnership with DNASB has also been mutually beneficial as different expertise is brought to the project.”

“The client has so far been impressed with our progress. This includes processing rainfall archives for five years and deriving empirical relationships between the radar reflectivity and rain rates. The abstraction process alone took a whole month of evenings to complete. All this work is interesting but it is the knowledge that the system will potentially save lives really focus the mind,” he concluded.

It is hoped that the system can be online from this year. After six months of testing the reliability of the system, the



Figure 1: Dr Lau explaining the subject matter



Figure 2: Some of the participants



Figure 3: Radar Reflectivity Energy Scan

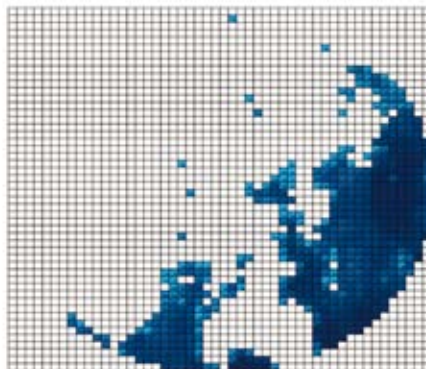


Figure 4: Radar data converted to gridded rainfall estimates



Figure 5: A big thank you to Dr Lau from IEM

AMRFF system will provide real-time flood forecasting and flood warnings for three main rivers in Peninsular Malaysia.

During his lecture, Dr Lau also discussed the potential use of the radar rainfall data for other uses. The data can potentially be used for slope stability hazard mapping, bridge scour and water resource management. The talk ended at 7.30 p.m. with many interesting questions from the floor. Dr Ooi, Chairman of the CESIG presented a certificate and token of appreciation to Dr Lau for his excellent presentation. ■

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