Water Management
Volume 165 Issue WM5

Editorial
Dingley

ice | proceedings

Proceedings of the Institution of Civil Engineers
Water Management 165 May 2012 Issue WM5
Pages 245–246 http://dx.doi.org/10.1680/wama.2012.165.5.245

ice
Institution of Civil Engineers
publishing

Editorial

Karen Dingley BEng, CEng, MICE, MIEAus
UK Surface Water Manager and Senior Water Engineer, Golder Associates UK Ltd., Maidenhead

As the UK faces a second consecutive winter of below average rainfall, and many areas of the world are facing drought conditions, the importance of efficiently managing limited available water resources is a growing area of concern. Considerable investment is being placed into increasing community awareness and changing behaviours, and governments worldwide are developing targeted policies to preserve water as a crucial commodity. Nevertheless, the infrastructure used to collect, store and distribute water can often introduce inefficiencies, and it is incumbent on engineers to address these wherever possible.

I am delighted to introduce this issue of *Water Management* which focuses upon the design and performance of infrastructure that is widely used worldwide to improve our management of this precious (and increasingly limited) resource.

Within this issue Vatankhah (2012) opens with a briefing paper that interrogates the hydraulic performance of side (or lateral) weirs. Broadly used to control the distribution of flow, the analysis of the water surface profile across the lateral weir is critical to its design. This briefing focuses specifically on the performance of a side weir within a trapezoidal (and triangular) channel, reflecting more fully the configuration that would typically be utilised in the development of a drainage or irrigation system. The author presents a novel analytical approach to the computation of the water surface profile across a lateral weir, providing a practical tool for designers.

Radial gates are also regularly used in irrigation networks to manage the movement of water. Zahedani *et al.* (2012) present the findings of a comprehensive study into the performance of radial gates under a range of flow conditions. Whilst it is accepted that radial gates are typically constructed with a fixed axis, the authors stipulate that introducing a system that allows vertical adjustment of the trunnion pin will enable water managers to optimise more fully the efficiency of their irrigation network. To this end, this paper provides a practical suite of equations to assess the flow of water beneath a gate with a variable trunnion pin height.

Farhangi *et al.* (2012) present a topical paper that investigates the effectiveness of widely used industry models for assessing reservoir operation. The authors interrogate and compare the practical application of simulation (ModSim and Weap) and optimisation (Lingo 8) modelling packages over a 5-year low flow period within the Karoon Basin, Iran. Assessing both single and multi-reservoir systems, specific recommendations are provided to guide the application of modeling packages to maximise operational reliability under a range of practical scenarios. The paper will be of interest to water providers, practitioners and regulators alike.

Continuing with the important theme of water resource management, Baoxiang *et al.* (2012) focus upon the assessment of groundwater vulnerability within the Huangshuihe catchment, China. Introducing a novel approach that seeks to address the empirical uncertainty inherent in traditional analysis methods, the authors consider the application of fuzzy mathematics and entropy to optimise the Drastic model. The paper presents a very practical use of GIS and fuzzy theorem, providing interesting conclusions as to the physical characteristics that represent the greatest sensitivity when assessing groundwater vulnerability.

Finally, Beecham and Chowdhury (2012*)* consider the effectiveness of bioretention and infiltration water sensitive urban design (WSUD) technologies within Australia, assessing their performance under variable rainfall conditions. Particularly susceptible to scour damage, the velocity of flow through a bioretention system is a critical design consideration, particularly in areas where the intensity of rainfall is characteristically high. Permeable pavements represent an opportunity for both effective site drainage and re-use of captured runoff. The design of these systems however requires a careful balance to be achieved between the effectiveness of the facility during periods of wet weather, and the cost (including land-take) required to provide a reliable supply of water during dry spells. This paper categorises the rainfall characteristics of ten major Australian cities, and interrogates how these have changed since the 1960s. The impact of these climatic changes upon the design and long term effectiveness of bioretention basins and permeable pavements is then assessed. With growing emphasis being placed globally upon the effective management of our urban environments under increasingly extreme dry and wet weather conditions, this paper will be of particular interest to both designers and regulators.

REFERENCES

Baoxiang Z, Cheng Y, Fanhai M and Li W (2012) GW vulnerability assessment based on entropy and fuzzy method. *Proceedings of the Institution of Civil Engineers – Water Management* **165(5)**: 277–283, http://dx.doi.org/10.1680/wama.10.00060.

Beecham S and Chowdhury R (2012) Effects of changing rainfall patterns on WSUD in Australia. *Proceedings of the*

Institution of Civil Engineers – Water Management **165(5)**: 285–298, http://dx.doi.org/10.1680/wama.10.00115.

Farhangi M, Bozorg-Haddad O and Mariño MA (2012) Evaluation of simulation and optimisation models for WRP with PI s. *Proceedings of the Institution of Civil Engineers – Water Management* **165(5)**: 265–276, http://dx.doi.org/10.1680/wama.10.00046.

Vatankhah AR (2012) Briefing: Water surface profile over side weir in a trapezoidal channel. *Proceedings of the Institution of Civil Engineers – Water Management* **165(5)**: 247–252, http://dx.doi.org/10.1680/wama.11.00065.

Zahedani MR, Keshavarzi A, Javan M and Shahrokhnia MA (2012) New equation for estimation of radial gate discharge. *Proceedings of the Institution of Civil Engineers – Water Management* **165(5)**: 253–263, http://dx.doi.org/10.1680/wama.10.00080.