Editorial

This issue contains 11 papers – extensions of those presented at the 12th International Conference on Computing and Control for the Water Industry – CCWI2013 (Perugia, 2–4 September 2013) – that have been fully rewritten and have undergone a rigorous peer review process. Some information about CCWI Conferences may be found in Figure 1 and Table 1.

Most of the selected papers – namely six – concern water quality related problems along with proper procedures to manage them in drinking water distribution systems (DWDS). To predict the daily maximum water temperature in DWDS, Agudelo-Vera *et al.* (2015) use the weather forecast information or the actual records as a short-term prediction. In the paper they show that such a procedure allows serving as an 'early warning system' to monitor drinking water temperature for taking measurements to avoid exceeding the maximum allowed temperature. Based on two-dimensional and three-dimensional computational fluid dynamics simulations as well as laboratory experiments, Braun *et al.* (2015) propose a model of the mixing process at different types of junctions. With regard to realistic junction scenarios, the results show that mixing – often incomplete – depends on the geometry and the load configuration; moreover some shortcuts and preferential flow pathways with no mixing at all may occur. The paper by Di Cristo *et al.* (2015) concerns the modelling of trihalomethanes (THMs) concentrations in water supply systems by means of different – i.e., first and second order and two phase – calibrated kinetic models. The results obtained for a real case study point out the reliability of the simplest first order model that is also less affected by measurement uncertainty. Husband & Boxall (2015) present a predictive discolouration modelling and subsequent field trial validation as a tool for an 'operational flow conditioning' maintenance plan that reduces discolouration risk, improves network resilience and asset condition in trunk mains. Flow trails conducted and modelled highlight the need for appropriate maintenance strategies. Kim *et al.* (2015) propose a generic modelling framework to amalgamate most widely used existing chlorine decay models. Fourteen distinct model structures have been checked by considering tests executed on a pilot-scale water distribution network (WDN). The generic model robustly predicts the chlorine concentration in a quite large range of flow conditions. Oliker & Ostfeld (2015) examine two applied classification models alerting for contamination events in WDNs based on a multivariate analysis of water quality on-line measurements. The models have been trained and tested on real water utility data with randomly simulated events showing high accuracy and detection ability compared to previous studies.

The second group of papers relates to pipe system diagnosis, i.e. the detection of system failures due to the presence, as an example, of leaks or partial blockages. Candelieri *et al.* (2015) combine hydraulic simulation and Network Science based Data Analysis techniques to analytically identify leaks in a WDN. In the first phase of the procedure, several 'leakage scenarios' are considered and a dataset with the corresponding variations of pressure and discharge induced by leakage is obtained. Then a clustering procedure on potential locations of pressure and flow sensors – i.e., all junctions and pipes – is performed to select the combination of probes which guarantees the best trade-off between reliability in localizing leaks and overall cost. With respect to the literature, where a deterministic approach is followed, in the paper by Massari *et al.* (2015) the inverse problem of detecting and sizing partial blockages is cast in the probabilistic framework by means of the stochastic Successive Linear Estimator. Thus, the proposed model estimates the distribution of diameters within a pipe with partial blockages and quantifies the uncertainty associated with these estimates. The paper shows that a first good estimate of the extent and severity of the blockages can be obtained by a single transient test.

The third group of papers refers to other important aspects of pipe system management such as hydraulic model building, the role played by balancing tanks, and water demand time series analysis. To take into account continuous changes in WDNs (e.g., pipe renewals, new

doi: 10.2166/aqua.2015.000

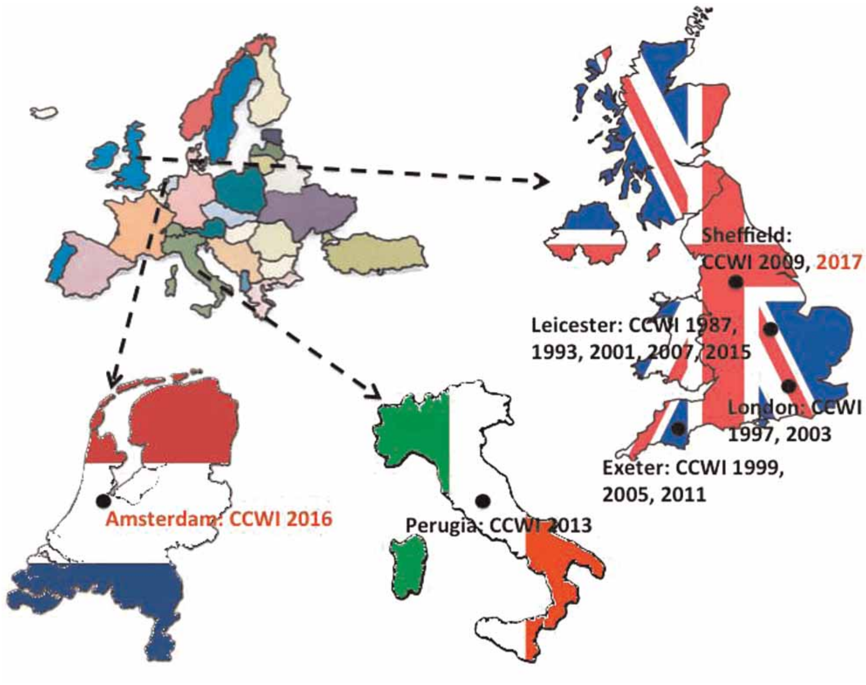

Figure 1 | Location of CCWI Conferences (in red). The full colour version of this figure can be viewed online by subscribers (http://www.iwaponline.com/jws/toc.htm).

Table 1 | CCWI Conferences: organization and publishing (courtesy of B. Ulanicki)

Conference	Organizer	Title of the proceedings	Editors
CCWI1987	Leicester Polytechnic, Leicester, UK	Computer Applications in Water Supply	B. Coulbeck, and C.-H. Orr
CCWI1993	De Montfort University, Leicester, UK	Integrated Computer Applications in Water Supply	B. Coulbeck
CCWI1997	Brunel University, London, UK	Computing and Control for the Water Industry	R. Powell, and K.S. Hindi
CCWI1999	Exeter University, Exeter, UK	Water Industry Systems: modelling and optimization applications	D. A. Savic, and G. A. Walters
CCWI2001	De Montfort University, Leicester, UK	Water Software Systems: theory and applications	B. Ulanicki, B. Coulbeck, and J.P. Rance
CCWI2003	Imperial College, London	Advances in Water Supply management	C. Maksimovic, D. Butler, and F. A. Memon
CCWI2005	Exeter University, Exeter, UK	Computing and Control for the Water Industry, Water management for the 21st Century	D. A. Savic, G. Walters, R. King, and S-T. Khu
CCWI2007	De Montfort University, Leicester, UK	Water management Challenges in Global Change	B. Ulanicki, B. Coulbeck, and J.P. Rance
CCWI2009	Sheffield University, Sheffield, UK	Integrating water Systems	J. Boxall, and C. Maksimovic
CCWI2011	Exeter University, Exeter, UK	Urban Water Management: Challenges and Opportunities	D.A. Savic, Z. Kapelan, and D. Butler
CCWI2013	Perugia University, Perugia, Italy	12th International Conference on Computing and Control for the Water Industry, CCWI2013	B. Brunone, O. Giustolisi, M. Ferrante, D. Laucelli, S. Meniconi, L. Berardi, and A. Campisano

developments, demands, etc.), the hydraulic model has to be operatively updated. In Puust *et al.* (2015) various model building alternatives are analysed so that data reload can be easily managed by water companies for real decision-making. Despite the benefits that the tanks may bring, they are usually omitted in the optimization process or in reliability assessment of WDNs. In fact, indices describing network reliability are evaluated exclusively based on pipe failure analyses, without taking into account the volume of possibly balancing tanks. Trifunovic *et al.* (2015) prove the ability of Networks Optimisation and Reliability Assessment Tool that determines the required balancing volume, optimizes pipe diameters and tank elevations, and finally calculates the total cost of supply. In Alvisi *et al.* (2015), five variants of a procedure for spatial aggregation of a synthetic water demand time series are compared. Such a procedure allows for the spatial aggregation of hourly synthetic water demand time series preserving their statistics. The results of a case study point out the different effectiveness in reproducing the statistics of interest and the computational burden of the considered variants that represent a reliable tool for the bottom-up generation of synthetic water demand time series.

Guest Editors
B. Brunone
M. Ferrante
S. Meniconi
Dipartimento di Ingegneria Civile ed Ambientale (DICA),
The University of Perugia,
via G. Duranti 93,
06125 Perugia,
Italy

L. Berardi
Dipartimento di Ingegneria Civile e Architettura,
The Technical University of Bari,
via Orabona 4,
70125 Bari,
Italy

REFERENCES

Agudelo-Vera, C. M., Blokker, E. J. M. & Pieterse-Quirijns, E. J. 2015 Early warning system to forecast maximum temperature in drinking water distribution systems. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 496–503.
Alvisi, S., Ansaloni, N. & Franchini, M. 2015 Five variants of a procedure for spatial aggregation of synthetic water demand time series. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 629–639.
Braun, M., Thomas, B., Hervé, H., Piller, O. & Gilbert, D. 2015 CFD modeling of contaminant mixing at junctions for an online security management toolkit in water distribution networks. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 504–515.
Candelieri, A., Soldi, D. & Archetti, F. 2015 Cost-effective sensors placement and leak localization – Neptun pilot of the ICeWater project. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 567–582.
Di Cristo, C., Leopardi, A. & de Marinis, G. 2015 Assessing measurements uncertainty on trihalomethanes prediction through kinetic models in water supply systems. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 516–528.
Husband, P. S. & Boxall, J. 2015 Predictive water quality modelling and resilience flow conditioning to manage discolouration risk in operational trunk mains. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 529–542.
Kim, S., Kim, H. & Koo, J. 2015 A general framework of chlorine decay modeling at a pilot scale water distribution system. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 543–557.
Massari, C., Yeh, T.-C. J., Ferrante, M., Brunone, B. & Meniconi, S. 2015 A stochastic approach for extended partial blockage detection in viscoelastic pipelines. Numerical and laboratory experiments. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 583–595.
Oliker, N. & Ostfeld, A. 2015 Comparison of two multivariate classification models for contamination event detection in water quality time series. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 558–566.
Puust, R., Koor, M. & Vassiljev, A. 2015 Water distribution model for decision making with updatable data links. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 596–609.
Trifunovic, N., Abunada, M., Babel, M. & Kennedy, M. 2015 The role of balancing tanks in optimal design of water distribution networks. *Journal of Water Supply: Research and Technology – AQUA* **64** (5), 610–628.