**Modeling household water use behavior**

Significant reduction in household water consumption can be achieved by understanding their influencing factors and subsequent modeling. A good model can be used to run simulations to predict future water demand and behavioral and technological intervention effects such as end user nudges and city sponsored water efficient devices giveaways respectively. Numerous factors such as property characteristics (citation), housing characteristics (citation), personal characteristics (citation), pricing (citation) and socio-economic factors (Jorgensen, Graymore, and O’Toole 2009) influence household water consumption. Numerous studies are now able to present more accurate models made which have been possible by detailed, disaggregated consumption data. Blokker et al. (Blokker, Vreeburg, and Dijk 2010) built a stochastic model based off user statistics such as census data and end use data such as frequency, occurrence and duration of water usage. The simulation results showed good correspondence to water demand. Bennet et al. (Bennett, Stewart, and Beal 2013) used Artificial Neural Networks (ANNs) to forecast future water use demand based from appliance, socio-economic, demographic and disaggregated water end use data. Froelich and Magiera (Froelich and Magiera 2016) proposed a Bayesian model for forecasting household water time series consumption data. This method has the advantage of not relying on detailed surveys and questionnaires but just the water consumption time series.

Bibliography

Bennett, Christopher, Rodney A. Stewart, and Cara D. Beal. 2013. “ANN-Based Residential Water End-Use Demand Forecasting Model.” *Expert Systems with Applications* 40 (4): 1014–23. doi:10.1016/j.eswa.2012.08.012.

Blokker, E. J. M., J. H. G. Vreeburg, and J. C. van Dijk. 2010. “Simulating Residential Water Demand with a Stochastic End-Use Model.” *Journal of Water Resources Planning and Management* 136 (1): 19–26. doi:10.1061/(ASCE)WR.1943-5452.0000002.

Froelich, Wojciech, and Ewa Magiera. 2016. “Forecasting Domestic Water Consumption Using Bayesian Model.” In *Intelligent Decision Technologies 2016*, edited by Ireneusz Czarnowski, Alfonso Mateos Caballero, Robert J. Howlett, and Lakhmi C. Jain, 337–46. Smart Innovation, Systems and Technologies 57. Springer International Publishing. http://link.springer.com/chapter/10.1007/978-3-319-39627-9\_29.

Jorgensen, Bradley, Michelle Graymore, and Kevin O’Toole. 2009. “Household Water Use Behavior: An Integrated Model.” *Journal of Environmental Management* 91 (1): 227–36. doi:10.1016/j.jenvman.2009.08.009.

Open links

<https://scholar.google.com/scholar?start=10&q=decision+tree+model+water+household+use+behaviour&hl=en&as_sdt=0,45>

<http://www.sciencedirect.com/science/article/pii/S0301479709002850>

<https://scholar.google.com/scholar?start=3&hl=en&as_sdt=5,45&sciodt=0,45&cites=12471560834107398157&scipsc>=

<http://www.sciencedirect.com/science/article/pii/S0957417412009736>

<http://link.springer.com/chapter/10.1007/978-3-319-39627-9_29>

<http://ascelibrary.org/doi/abs/10.1061/(ASCE)WR.1943-5452.0000002>

<https://scholar.google.com/scholar?start=132&hl=en&as_sdt=5,45&sciodt=0,45&cites=17078889500261591021&scipsc>=

<http://www.sciencedirect.com/science/article/pii/S1877705814026381>

<http://jh.iwaponline.com/content/18/1/4.abstract>

<http://www.mdpi.com/2073-4441/5/3/1082/htm>

<http://www.hydrol-earth-syst-sci.net/17/3957/2013/hess-17-3957-2013.pdf>

<http://www.koreascience.or.kr/article/ArticleFullRecord.jsp?cn=SJOHCI_2012_v45n11_1187>

To read

ANN article