H32G-04: Using QMRAcatch – a stochastic hydrological water quality and infection risk model – to identify sustainable management options for long term drinking water resource planning

Wednesday, 13 December 2017
11:05 - 11:20
New Orleans Ernest N. Morial Convention Center - 293-294

River water resources in urban environments play a critical role in sustaining human health and ecosystem services, as they are used for drinking water production, bathing and irrigation. In this study the hydrological water quality model QMRAcatch was used combined with measured concentrations of human enterovirus and human-associated genetic fecal markers. The study area is located at a river/floodplain area along the Danube which is used for drinking water production by river bank filtration and further disinfection. QMRAcatch was previously developed to support long term planning of water resources in accordance with a public infection protection target (Schijven et al., 2015). Derx et al. 2016 previously used QMRAcatch for evaluating the microbiological quality and required virus-reduction targets at the study area for the current and robust future “crisis” scenarios, i.e. for the complete failure of wastewater treatment plants and infection outbreaks. In contrast, the aim of this study was to elaborate future scenarios based on projected climate and population changes in collaboration with urban water managers. The identified scenarios until 2050 include increased wastewater discharge rates due to the projected urban population growth and more frequent storm and overflow events of urban sewer systems following forecasted changes in climate and hydrology. Based on the simulation results for the developed scenarios sustainable requirements of the drinking water treatment system for virus reductions were re-evaluated to achieve the health risk target. The model outcomes are used to guide practical and scientifically sound management options for long term water resource planning.

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References

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Plain Language Summary

Authors

Julia Derx *

Interuniversity Cooperation Centre for Water and Health (ICC Water & Health), www.waterandhealth.at

Vienna University of Technology

Katalin Demeter

Vienna University of Technology

Interuniversity Cooperation Centre for Water and Health (ICC Water & Health), www.waterandhealth.at

Jack F Schijven

National Institute for Public Health and the Environment (RIVM)

Utrecht University

Regina Sommer

Medical University of Vienna

Interuniversity Cooperation Centre for Water and Health (ICC Water & Health), www.waterandhealth.at

Christa M. Zoufal-Hruza
IFUM Laboratories of Environmental Medicine

Harald Kromp
Vienna Water

Andreas Farnleitner
Karl Landsteiner Privatuniversität

Vienna University of Technology

Alfred Paul Blaschke
Interuniversity Cooperation Centre for Water and Health (ICC Water & Health), www.waterandhealth.at

Vienna University of Technology

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