Editorial: The XXIX Nordic Water conference

The XXIX Nordic Water conference was held at Vytautas Magnus University in Kaunas, Lithuania, on 8–10 August 2016. The university is one of the most liberal and modern academic institutions in Lithuania, boasting an exciting history, nurturing and continuing deep-rooted traditions, playing a leading role not just in Lithuania, but also the entire Baltic and European intellectual and cultural sphere.

In total, over 80 abstracts were submitted from 16 countries, including Nordic and Baltic countries, where most contributions came from, as well as China, Czech Republic, France, Ireland, Japan, Poland, Portugal and Russia.

The main topic was the 'role of hydrology towards water resources sustainability', with scientists from different countries exchanging their views on assessment and prediction of key variables of water cycle, as well as sharing their scientific knowledge on advanced methods and modelling technology. The conference themes revolved around hydrological implications of climate and environmental change; the role of hydrology on terrestrial ecosystems and greenhouse gas emissions; advanced methods and technology in hydrological modelling; agricultural, forest and urban green water management; interactions between surface and groundwater; hydrology and EU water policy with a special focus on water quality and flood risk management; water ecology and restoration of disturbed water ecosystems; and hydropower and the use of water resources (renewable energy sources).

Changes in water quantity and quality in the Baltic Sea region occur as consequences of global, regional and local environmental factors, climate change and human-induced impacts. Therefore, science-based knowledge on the assessment and prediction of hydrological processes due to these changes is essential to achieve sustainable water resource systems. The dynamic assessment of water resources provides more reliable predictions of temporal and spatial water availability and water quality. In this context, the conference addressed the role hydrology plays in the assessment of the changes in hydrological cycle, along with the ability to predict the variations in hydrological processes striving for water resources sustainability. The conference outcomes are expected to contribute to more effective integrated water resources management at regional and national scales.

After the conference, authors were given the opportunity to submit their original contributions for publication in a special issue of *Hydrology Research*. All submitted abstracts were evaluated and discussed by a scientific committee. After a rigorous peer-review process, 15 papers were accepted for publication in this special issue covering a range of the conference themes outlined above.

Kundzewicz *et al.* (2018) provide an overview of changes in river flood hazards in Europe, and it is found difficult to disentangle the climatic change component from strong natural variability and direct human impacts. However, an increasing tendency in the number of floods with large magnitude and severity is clear. Piniewski *et al.* (2018) assess climate change impacts on spatiotemporal changes in annual and seasonal runoff and its components in the basins of two large European rivers, the Vistula and the Odra, for future horizons using the SWAT model, set up at high resolution, and driven by a multi-model ensemble (MME) of nine bias-corrected EURO-CORDEX simulations under two representative concentration pathways (RCPs), 4.5 and 8.5.

Osuch *et al.* (2018) estimate changes of low flow indices under future climates for eight catchments in Poland. A comparison of indices from the two future periods (2021–2050 and 2071–2100) with the reference period 1971–2000 confirmed decrease of low flow events and their intensity. Šarauskienė *et al.* (2018) and Jurgelėnaitė *et al.* (2018) study spatial and temporal variation of river water temperature in the Baltic States and projected the effects of changing climate on Lithuanian river runoff and water temperature, respectively. Bardule *et al.* (2018) evaluate macronutrient leaching in a juvenile hybrid aspen (*Populus tremula* L. × *P. tremuloides* Michx.) plantation cultivated in an agroforestry system and fertilized with biogas production residues, wastewater sludge and wood ash in hemi-boreal climate conditions in Latvia. Analysis of macronutrient concentrations in the soil solution show that annual

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macronutrient leaching decreased over time after the establishment of the plantation and application of fertilizers.

Huang & Hattermann (2018) assess coupling of a global hydrodynamic algorithm and a regional hydrological model for large-scale flood inundation simulations. The results show the potential of coupled models for flood risk assessments along large rivers. Zhuan *et al.* (2018) propose a method to estimate the timing of human-induced climate change (HICC) emergence from internal climate variability (ICV) for hydrological impact studies based on climate model ensembles. It is shown that adapting to ICV may well turn out to be the most efficient approach in estimating HICC in the near future.

Kobierska *et al.* (2018) and Engeland *et al.* (2018) present an evaluation of design flood estimation methods in Norway, and carried out a study using historical data in flood frequency analysis for four catchments in Norway and demonstrate that reliability and stability improves, especially for short record lengths and long returns periods. Yang *et al.* (2018) estimate runoff prediction in ungauged catchments in Norway. Comprehensive assessment of the strengths and limitations of existing regionalization methods in predicting ungauged stream flows in the high latitudes, large climate and geographically diverse, seasonally snow-covered mountainous catchments was made in this research.

Ye *et al.* (2018) evaluate multiple methods for assessing water resources variability of a lake–river system under the changing environment. Zhang *et al.* (2018) analyse characteristics of rainfall and runoff in different extreme precipitation events in the Beijing mountain area (based on a rainstorm of 20 July 2016). Meanwhile, Li *et al.* (2018) use laboratory stimulation testing to evaluate rock fragment cover efficacy for nutrient conservation under varied rainfall intensities in Northwest China. Research results indicated that rock fragment cover is an effective method for reducing land degradation and improving local environmental conditions.

Sun *et al.* (2018) explore how forest litter exerts runoff hydrological characteristics and sediment yield processes during the experiments on forest covered (*Vitexnegundo* var. *heterophylla*) slopes under various combinations of rainfall intensities and slope gradients. Zhuan *et al.* (2018) propose a method to estimate the timing of human-induced climate change (HICC) emergence from internal climate variability (ICV) for hydrological impact studies based on climate model ensembles. It is shown that adapting to ICV may well turn out to be the most efficient approach in estimating HICC in the near future.

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