

## XVIII World Water Congress, Special Session

**Title: Hydro - meteorological extremes and urban sustainable development in a changing environment**

**Organization: Wuhan University**

**Date: September 12th Hours: 11:00-12:30 Room: Room 11 Session No.: SS 21**

**Theme: 1 Submission No.: SS-1-20**

### Session Organizers

**Jie Chen**, State Key Laboratory of Water Resources Engineering and Management, Wuhan University, Wuhan 430072, China

**Chong-Yu Xu**, Department of Geosciences, University of Oslo, P.O. Box 1047, Blindern, 0316 Oslo, Norway

|             |                  |   |  |
|-------------|------------------|---|--|
| 11:00-11:05 | Welcome Remarks  | <b>Jun Xia</b> , Academician of Chinese Academy of Sciences, Wuhan University, China  | Chair:<br><b>Chong-Yu Xu</b><br>(University of Oslo) |
| 11:05-11:20 | Keynote Speeches | <b>Asit K. Biswas</b> (University of Glasgow, UK): Managing water under more frequent extreme hydrological conditions: A perspective from Asian monsoon countries             |  |
| 11:20-11:35 |                  | <b>Lu Zhang</b> (Wuhan University, China): Increased risks of hydrometeorological extremes in the Murray-Darling Basin under climate change                                   |  |
| 11:35-11:50 |                  | <b>Kuniyoshi Takeuchi</b> (University of Yamanashi, Japan): Transdisciplinary approach for building societal resilience to water-related disasters                            |  |
| 11:50-12:05 | Discussion       | <b>Nils Roar Sælthun</b> (University of Oslo, Norway): Integrated hydro-economic modelling for urban stormwater fee estimation, an incentive for better stormwater management | Chair:<br><b>Jie Chen</b><br>(Wuhan University)      |
| 12:05-12:20 |                  | <b>Denghua Yan</b> (China Institute of water Resources and Hydropower Research, China): Collaborative flood and drought disaster response based on total element process      |  |
| 12:20-13:30 |                  | <b>Asit K. Biswas, Kuniyoshi Takeuchi, Nils Roar Sælthun, Denghua Yan, Jun Xia, Chong-Yu Xu, Lu Zhang</b>   |  |

## Session Description

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Global warming increases water vapour concentration and water transportation in the atmosphere, and the impacts on intensification process of the hydrological cycle has become an indisputable fact. Together with influences of the intensified human activities, the flood and drought appear as an increasing pattern in both occurrence and magnitude, which consequently bring more disasters to the population, property and infrastructure systems. Between 80-90% of all documented disasters from natural hazards during the past 10 years have resulted from floods, droughts, tropical cyclones, heat waves and severe storms. During 1998-2017, floods affected more than 2 billion people worldwide. This is particularly true for urban areas, since changing frequencies and intensities of hydro-meteorological extremes directly affect settlement vulnerability. For example, the extreme rainfall event occurred over Zhengzhou, the capital city of Henan Province of central China during 19-20 July 2021 caused devastating floods, resulted in 292 dead, 47 lost and a direct economic loss of 114,269 billion Yuan. When combined with rapid urbanization, the hydro-meteorological extremes also influence urban water security and urban resilience.

Water security and urban sustainability in the changing environment has become a major challenge to the sustainable development of human society. Improved understanding the mechanism of changing hydro-meteorological extremes can help us to develop adaptation strategies to ensure future water security and urban sustainable development.

Therefore, we propose to organize a special session at the XVIII World Water Congress by inviting scientists from multidisciplinary research areas to discuss the following topics (but not limited to):

- Mechanism of the changing hydro-meteorological extremes in a changing environment;
- Flood and drought risk assessment and urban water security in a changing environment;
- Adaptation strategies and risk managements toward urban sustainable development.