To date, the world is undergoing the largest wave of urban growth in human history. According to the United Nations, around 50% of the world’s population currently lives in an urban environment, and more than 70% of world population is expected to live in cities by 2050. A positive consequence of urbanization may be stronger economic growth due to the higher concentration of economic activities driven by economies of scale. However, continuous population growth and migration during the urbanization process will contribute to reliance on more water, energy, ecological, and environmental resources. Urban metabolism is intimately tied to the geological, environmental, hydrological, ecological, public health and social dimensions in the food-water-energy-waste nexus. As a consequence, rapid urbanization normally ends up significant discharge of wastewater and stormwater, consumes more food, energy and drinking water, emits more greenhouse gases, as well as generates more solid/hazardous waste harmful to human health and the global environment. These urban communities are all vulnerable to natural hazards, climate variability, and unexpected environmental/industrial incidents given the current sociotechnological complexity.

This special issue focuses on the development of urban geoscience with urban sustainability concerns, a new subject area of importance in sustainability science, to perform thorough investigation of basic physical, chemical, biological, ecological, hydrological, geological, and environmental processes with the state-of-the-art earth observations and cyber-innovated numerical simulation, to explore urban geoscience from unique sustainability characteristics, and to disclose novel research results based on case studies with major sustainability factors.
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Guest Editors

Dr. Kaixu Bai
Key Laboratory of Geographic Information Science
Ministry of Education
East China Normal University
Shanghai 200241, China
E-mail: kxbai@geo.ecnu.edu.cn

Dr. Lutz Weihermüller
Forschungszentrum Jülich GmbH
Institut für Bio- und Geowissenschaften
IBG-3: Agrosphäre, Germany
Email: l.weihermueller@fz-juelich.de

Dr.ir. Marie-claire ten Veldhuis
Department of Civil Engineering & Geosciences
Technical University of Delft
PO Box 5048, 2600 GA Delft, The Netherlands
Email: j.a.e.tenveldhuis@tudelft.nl

Dr. Ni-Bin Chang
Stormwater Management Academy
University of Central Florida
4000 Central Florida Blvd.
Orlando, FL 32816, United States of America
E-mail: nchang@ucf.edu