

Editorial: The multi-faceted nature of Blue-Green Systems coming to light

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Cities are facing more challenges in the way they manage water, especially under rapid urbanisation and climate change. One of the solutions for our cities is to adopt green, vegetated infrastructure into water systems, i.e., so called ‘Blue-Green Systems’. ‘Blue’ here stands for water, while ‘green’ refers to resource and energy efficient, recovery and reuse water systems. They are distributed treatment systems labelled as nature friendly engineered approaches, ranging from, but not limited to, constructed wetlands, ponds, large bioretentions, and swales to porous pavements, infiltration trenches and small raingardens, etc. They are not new and have been increasingly adopted in urban areas under various concepts all over the world, e.g., water sensitive urban design (WSUD) in Australia, nature-based solutions (NBS) in Europe, sustainable urban drainage systems (SuDS) in UK, low impact developments (LIDs) in the USA, and more recently, sponge cities (SCs) in China. Such Blue-Green Systems are ecologically beneficial and already valued for their beautifying presence and are highly utilised design features in the cities. In addition to their water treatment functions, Blue-Green Systems provide multiple benefits, e.g., frequent flood mitigation, waterway health protection, microclimate improvement, and improvement of amenity values in urban landscapes.

The first issues of *Blue-Green Systems*:

- present the latest studies in this area. Firstly, the multiple benefits of Blue-Green Systems are recognised, not only for water pollution management (Ao *et al.* 2019), flood resilience improvement (O’Donnell *et al.* 2020), but more broadly their services to society and contributions to the United Nations Sustainable Development Goals (Sørup *et al.* 2019). Researchers have also started to identify NBS as a viable solution for resource recovery (Kisser *et al.* 2020).
- present studies with regard to the technology enhancement, by looking into the pollution retention capacity of media used (Tedoldi *et al.* 2019), and employment of real time control schemes (Persaud *et al.* 2019) in specific blue-green technologies, for improving system performance.
- deal more broadly with a wider spectrum of BGS topics. Papers cover sustainable and energy efficient distributed systems for wastewater treatment (Ersson & King 2019), and understanding of

pollution in natural water environment (Ma *et al.* 2020), as well as more advanced sustainable technologies and materials for water purification (Lakshmanan & Yung 2019; Han *et al.* 2019).

The Editors hope that by reading these papers, the use of sustainable and energy efficient BGS can be encouraged. Meanwhile, further research can be devoted to understanding the urban water issues and benefit of BGS, and consequently improved technologies can be developed and applied in the real world to solve the water challenges of a rapidly urbanising planet.

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SCOPE

Blue-Green Systems brings together cutting edge research on sustainable, energy efficient and environmentally responsible water use in cities and their regions, including innovative approaches such as Sponge Cities, Low Impact Development, Nature Based Solutions and Water Sensitive Urban Design. It welcomes contributions from water engineers, economists, planners, hydrologists, ecologists, sociologists, architects, landscape designers, health workers, policymakers and anyone else engaged in solving the water challenges of a rapidly urbanising planet. Work at city, watershed, basin and region level is all of interest.

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