

Application and Prospect of Big Data in Water Resources

Danchi Xi and Xinyi Xu

College of Water Sciences, Beijing Normal University, Beijing, China (xidanchi@mail.bnu.edu.cn)

Because of developed information technology and affordable data storage, we have entered the era of data explosion. The term “Big Data” and technology relates to it has been created and commonly applied in many fields. However, academic studies just got attention on Big Data application in water resources recently. As a result, water resource Big Data technology has not been fully developed. This paper introduces the concept of Big Data and its key technologies, including the Hadoop system and MapReduce. In addition, this paper focuses on the significance of applying the big data in water resources and summarizing prior researches by others. Most studies in this field only set up theoretical frame, but we define the “Water Big Data” and explain its tridimensional properties which are time dimension, spatial dimension and intelligent dimension. Based on HBase, the classification system of Water Big Data is introduced: hydrology data, ecology data and socio-economic data. Then after analyzing the challenges in water resources management, a series of solutions using Big Data technologies such as data mining and web crawler, are proposed. Finally, the prospect of applying big data in water resources is discussed, it can be predicted that as Big Data technology keeps developing, “3D” (Data Driven Decision) will be utilized more in water resources management in the future.