

EGU23-4589, updated on 25 Apr 2024

<https://doi.org/10.5194/egusphere-egu23-4589>

EGU General Assembly 2023

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Digital Twin Water Management Platform - Innovative approach for optimal water management

Jingon Kim, Kichul Kim, Junghwan Lee, Mookhyunk Kwon, Hyunjin Kim, and Youngsik Jo

Korea Water Resources Corporation, Water Resources Operation, Korea, Republic of (jgkim@kwater.or.kr)

Recently, digitalization has impacted drought and flood forecasting systems, and makes the application of technologies and advanced data processing techniques in the water management field possible. Especially, digital twin in the field of water management aims to effectively diminish unprecedented water-related issues such as floods and droughts using 3D objects and high-resolution spatial data. Climate change effects are expected to increase flood and drought risk through more frequent heavy precipitation and global temperature rise, and the water disaster sector is so complex, dynamic, and unpredictable that requires sophisticated management systems. The digital approaches showed effective prediction and decision-making support. This paper presents the state-of-the-art of digital twin concepts along with different digital technologies and techniques in water management contexts. The digital twin platform developed by K-water is a virtual representation of water management for dam operation and urban flood warning with water-related data. It presents a general framework of the digital twin in risk management, optimal operation, and decision-making in the water management and disaster forecasting field. This review also described the water data management, modeling including artificial intelligence, Radar, CCTV, rainfall-runoff module, analysis, prediction, and communication aspects of a digital twin. Digital twin platforms can support decision-makers as the next generation of digitalization paradigm by continuous and real-time water management of the cyber world and simulating the various events in the cyber world.

Keywords: Digital Twin, Dam Operation, River, Spatial Data, AI, Urban Flood