



Terminology gap in hydrological cycle

Lu Zhuo and Dawei Han

University of Bristol, Civil Engineering, Bristol, United Kingdom (lz7913@bristol.ac.uk)

Water is central to life on Earth. People have been trying to understand how water moves in the hydrosphere throughout the human history. In the 9th century BC, the famous Greek poet Homer described the hydrological cycle in Iliad as “oceanos whose stream bends back in a circle” with a belief that rivers are ocean-fed from subterranean seas. Later, Aristotle (4th century BC) claimed that most of the water came from underground caverns in which air was transformed into water. It was only until 1674, French scientist Perrault developed the correct concept of the water cycle.

In modern times, scientists are interested in understanding the individual processes of the hydrological cycle with a keen focus on runoff which supplies water to rivers, lakes, and oceans. Currently, the prevailing concepts on runoff processes include ‘infiltration excess runoff’ and ‘saturation excess runoff’. However, there is no term to describe another major runoff due to the excess beyond the soil water holding capacity (i.e. the field capacity). We argue that a new term should be introduced to fill this gap, and it could be called ‘holding excess runoff’ which is compatible with the convention.

This new term is significant in correcting a half-century misnomer where ‘holding excess runoff’ has been incorrectly named as ‘saturation excess runoff’, which was introduced by the Xinanjiang model in China in 1960s. Similar concept has been adopted in many well-known hydrological models such as PDM and HBV in which the saturation refers to the field capacity. The term ‘holding excess runoff’ resolves such a common confusion in the hydrological community.