

Title: On the New Concept of the Available Water Climatology and Its Application

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Publication: American Geophysical Union, Fall Meeting 2014, abstract #ED11B-3402

Publication Date: 12/2014

Origin: [AGU](#)

Keywords: 0805 Elementary and secondary education

Bibliographic Code: [2014AGUFMED11B3402B](#)

Abstract

We propose a new concept of climatology called the Available Water Climate (AWC). Available water is 'the remained water usable in every moment' that is calculated regardless of any time intervals or the amounts of precipitation. With this concept, the Available Water Resources Index (AWRI) has been digitized following the earlier work of Byun and Lee (2002). The applicability of AWRI not only to the assessment and prediction of water related disasters but also to the academic researches has been tested. Resulted merits are as follows. Firstly, the threshold value of AWRI for the occurrence of all water related disasters like flood, drought, inundation landslide, and drought each region became clear, therefore the assessment and the prediction of them became much more precise than before. It became clear that the more extreme the AWRI value is, the severer the related disasters become. As example, all disasters caused by heavy rains, even though a small inundation, became predictable at the time step of heavy rain warning with the help of the Long-term remained water index(LWI). As another example, the drought intensity and its dates on start and end are defined with more reasonably and precisely than any other drought indexes with help of the Effective drought index (EDI) using sliding time scale. Secondly, the spatiotemporal distribution of water environment were digitized clearly and objectively using AWRI and new concepts of the Water Abundant Season (WAS) and the Little Water Season (LIWAS), their dates on start and end, and their strength were defined, which is very beneficial for agriculture, forestry, and all other water controls. Also, the differences of water environments

among regions were clearly digitized and the improvement of the climate classification by Köppen etc. became possible. Thirdly, other merits will be found continuously afterwards.