Geophysical Research Abstracts
Vol. 15, EGU2013-7599-1, 2013
EGU General Assembly 2013

Hydrological Catchment Similarity Assessment in Geum River Catchments, Korea

Ara Ko (1), Kisoon Park (2), and Hyosang Lee (3)

(1) Chungbuk National University, Cheongju, Korea, (2) Chungbuk National University, Cheongju, Korea, (3) Chungbuk National University, Cheongju, Korea (hyosanglee@chungbuk.ac.kr)

Similarity measure of catchments is essential for regionalization studies, which provide in depth analysis in hydrological response and flood estimations at ungauged catchments. However, this similarity measure is often biased to the selected catchments and is notclearly explained in hydrological sense. This study applied a type of hydrological similarity distance measure-Flood Estimation Handbook to 25 Geum river catchments, Korea. Three Catchment Characteristics, Area (A)-Annual precipitation (SAAR)-SCS Curve Number (CN), are used in Euclidian distance measures. Furthermore, six index of Flow Duration Curve (I_{Low}:Q_{275}/Q_{185}, $I_{Drought}$:Q_{355}/Q_{185}, I_{Flood}:Q_{max}/Q_{185}, $I_{Abundant}$:Q_{95}/Q_{185}, $I_{FloodDuration}$:Q_{10}/Q_{355} and $I_{RiverRegime}$:Q_{max}/Q_{min}) are applied to clustering analysis of SPSS. The catchments' grouping of hydrological similarity measures suggests three groups: H1 (Cheongseong, Gidae, Bukil, Oksan, Seockhwa, Habgang and Sangyeogyo), H2 (Cheongju, Guryong, Ugon, Boksu, Useong and Seokdong) and H3 (Muju, Yangganggyo and YongdamDam). The four catchments (Cheoncheon, Donghyang, DaecheongDam and Indong) are not grouped in this study. The clustering analysis of FDC provides four Groups; CFDC1 (Muju, YongdamDam, Yangganggyo, DaecheongDam, Cheongseong, Gidae, Seokhwa, Bukil, Habgang, Cheongju, Oksan, Yuseong and Guryong), CFDC2 (Cheoncheon, Donghyang, Boksu, Indong, Nonsan, Seokdong, Ugon, Simcheon, Useong and Sangyeogyo), CFDC3 (Songcheon) and CFDC4 (Tanbu). The six catchments (out of seven) of H1 are grouped in CFDC1, while Sangyeogyo is grouped in CFDC2. The four catchments (out of six) of H2 are also grouped in CFDC2, while Cheongju and Guryong are grouped in CFDC1. The catchments of H3 are categorized in CFDC1. The authors examine the results (H1, H2 and H3) of similarity measure based on catchment physical descriptors with results (CFDC1 and CFDC2) of clustering based on catchment hydrological response. The results of hydrological similarity measures are supported by clustering analysis of FDC. This study shows a potential of hydrological catchment similarity measures in Korea. It will be used as a starting point for flood predictions at ungauged catchment.