

EGU22-10937

<https://doi.org/10.5194/egusphere-egu22-10937>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Statistical Probable Maximum Precipitation using RCP 4.5 and RCP 8.5 scenarios

Miruo Seo¹, Sunghun Kim², jihye Kwon³, and Junhaeng Heo³

¹YONSEI, Seoul, Korea, Republic of (miru3851@yonsei.ac.kr)

²YONSEI, Seoul, Korea Republic of (sunghun@yonsei.ac.kr)

³YONSEI, Seoul, Korea Republic of (wisdom@kistec.com)

Probable maximum precipitation (PMP) means the maximum precipitation that can occur under the most severe weather conditions at specific area and rainfall duration in watershed. Greenhouse gas emissions in the atmosphere have increased due to industrialization caused by economic development and population growth. As a result, natural disaster damage from climate change is rapidly increasing because of many abnormal climates and phenomena. Furthermore, PMP has been increased due to such climate change. There are several methods for estimating PMP; statistical method, hydrometeorological method, and envelope method. In this study, statistical PMP was calculated using observed data up to 2020, and future PMP was estimated using the RCP 4.5 and RCP 8.5 scenarios up to 2100. The Hershfield's method was used to calculate the statistical PMP, World meteorological organization (WMO) introduced the statistical method suggested by Hershfield (1961) in which frequency factor was 15. However, the frequency factor of 15 was reported to be too large in the area with heavy rainfall and too small in a dry area. Therefore, Hershfield (1965) suggested the range of 5 ~ 20 as a frequency factor. In this study, PMPs for observed(historical) data and simulated data from RCP 4.5 and RCP 8.5 scenarios were calculated. Then the frequency factors were compared with those suggested by Hershfield. Finally, the derived statistical PMPs were compared with those from hydrometeorological method.