

EGU2020-12716

<https://doi.org/10.5194/egusphere-egu2020-12716>

EGU General Assembly 2020

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



Variability and trends of intense precipitation in a metropolitan area in the southern Brazil

Daniel Allasia¹, Ingrid Petry¹, Raviel Basso^{1,2}, Rutineia Tassi¹, and Bruna Minetto¹

¹Federal University of Santa Maria, Santa Maria (UFSM), Brazil

²Federal University of Goiás, Brazil

With the increase in the global population observed since the 20th century, urban centers are becoming more prominent, and its dynamic is now far from the natural. The impact of urbanization on the rainfall has been noticed since 1921 when Horton observed that cities with more than 100,000 inhabitants created favorable conditions for convective precipitation. Later, Huff and Changnon (1972) estimated an increase of 6 to 15% on average rainfall during the summer in these regions. Several other studies confirmed the trend and pointed out that on a small and medium scale, precipitation change is usually justified by the effect of heat islands. To understand these changes, high-resolution precipitation data is needed; however, due to the lack of monitored data, especially on the largest cities in the developing countries, new sources of information should be used. MSWEP is a three hourly gridded precipitation dataset, with 0.1° spatial resolution that combines data from gauges, satellite, and reanalysis-based data to provide precipitation estimates over the entire globe (Beck, 2019). In this study, MSWEP precipitation was used in order to observe the variability of intense precipitation over the Metropolitan Area of Porto Alegre in Southern Brazil, where some previous studies indicated urban effects on precipitation. Statistical analysis was performed to evaluate changes in the intense precipitation throughout the decades. The results show that the spatial distribution patterns of intense precipitation are maintained; however, in all statistics, it was possible to observe an increase in intense precipitation over the decades, that follows the increase of the urbanized area over time.