

Assignment Details

This is essentially a repeat of the in-class exercise from Wednesday 8/28, except now we are using different data and a different worksheet. In Wednesday's class, we used the average of all rain rate data for September-October-November (SON) of each year. For this exercise, we will use the heaviest rain rate: the maximum daily rain rate from each SON season.

The maximum daily rain rate for each SON is widely spread out, ranging from 12.7 mm to 95.3 mm, with values covering a broad range (from 0 to 100 mm). In contrast, the average rain rate is more tightly clustered, with values ranging from 0.7 mm to 4.7 mm, concentrated within a much narrower range (from 0 to 6 mm).

The distribution of maximum rain rates shows a more peaked bell-shaped pattern. Meanwhile, the average rain rate displays a more symmetric and smooth bell-shaped distribution. This is expected, as averaging smooths out extreme values, resulting in a more normally distributed pattern.

The maximum daily rain rate captures the most extreme precipitation event in a SON. Since extreme events can be influenced by weather patterns (such as El Niño), they can lead to a more varied and dispersed distribution. On the other hand, the average rain rate reflects the overall trend of precipitation for the entire SON, with less influence from extreme values. This results in a more compact distribution with less variation.

In the years with higher average rain rate, the maximum precipitation tends to be higher as well.

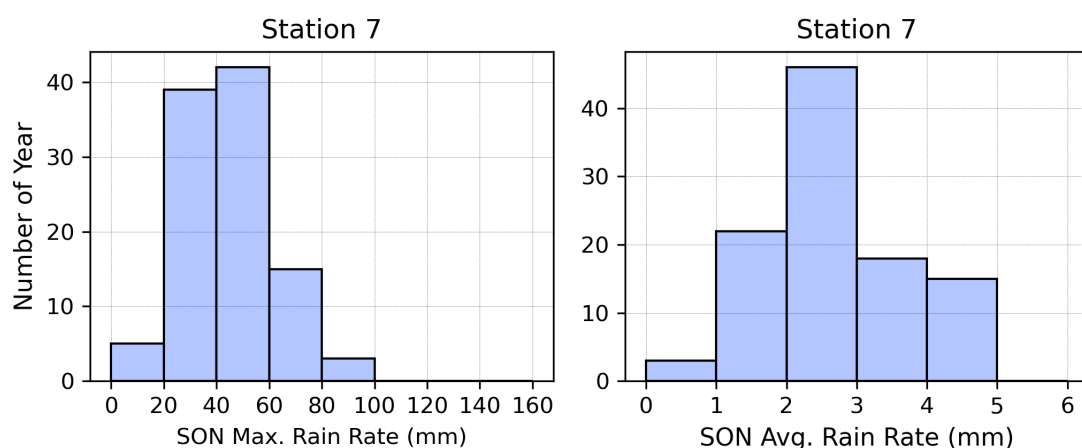


Figure 1. Probability distributions histogram of Station 7 SON Rain Rate. Max. Rain Rate (left), Avg Rain Rate (right).

Code and data can be found at <https://github.com/Gong001/EAS-G-577>