Quality Control for Rainfall Extremes

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Quality Control

Automated testing

Important for large scale data handling of observations and analysis of extreme events

Sequential checks

- Identifies duplicated observations
- Checks for abnormally large observations
- Failed spatial consistency check
- Failed temporal consistency check
- Temperature too warm for snow

and so on.

Issues

True extremes values dropped as outliers

- First step in an analysis is commonly to filter the data to remove observations flagged as outlier, but
- **Current outlier test** assumes normality – True extreme observations are being incorrectly flagged as outliers
- People are removing true extreme values from their analysis.

Untagged Accumulations

Rainfall observations on Sundays are recorded on Mondays

True extremes values are not outliers

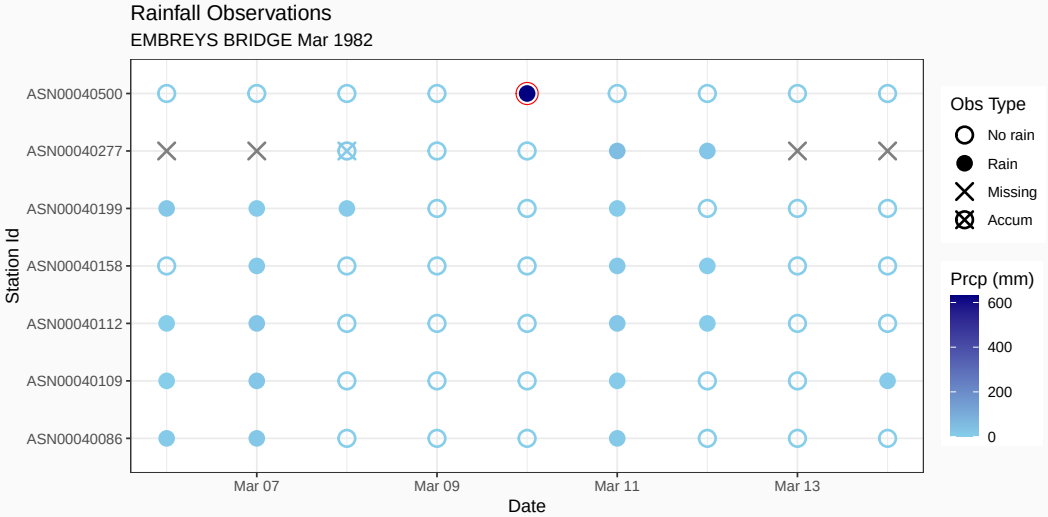
Spatial consistency check

Check if the observation of an “outlier” station is consistent with its neighbouring stations’ observed values.

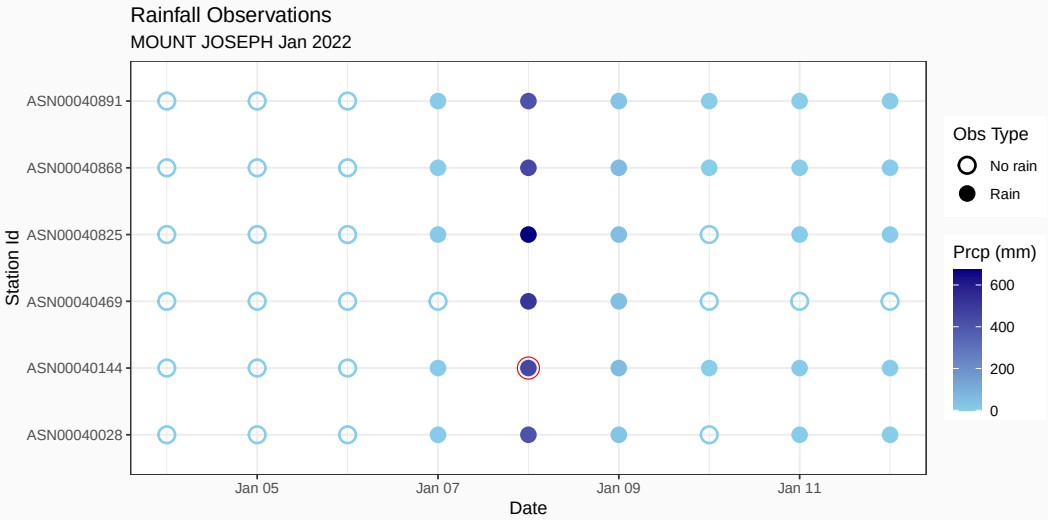
Southeast Queensland

- 60 observations were flagged as outliers and have sufficient neighbours for spatial consistency check
- 37 observations pass the spatial consistency check and should be extreme values and not outliers
- Outlier test has a false-positive rate of 62%

Example 1: Correct outlier flag



Example 2: False outlier (spatially consistent)



Example 3: False outlier (spatially inconsistent)

Suggestion

Where possible a spatial consistency check should be used, or

just don’t remove outliers.

Sunday-Monday Untagged Accumulations