Application of the ReDistribution Method on custom data subsets

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A brief history of the ReDistribution Method

- Basic principle: comparison of two consecutive distributions over equal moving window span
- Output value: ReDistribution Index (RDI) (as quantified variation of values’ distribution in time)
Time series of RDI

- Critical values: peaks significantly over noise (i.e. at least double magnitude of the noise level)
Special features of the ReDistribution Method

- Data input are observed values only (no calculated values, i.e. means, standard deviation...)
  - Consequence: independency of time scale (no temporal consistency necessary!)

- A mass of data builds distributions
  - Consequence: diminished irregular values (erroneous values, outliers, small gaps - no QCd series necessary!)
Special features of the ReDistribution Method

- Simultaneous run of more than one series
  - Consequence: ability to deal with all wind parameters – direction, speed, gusts...

- Main feature of the method: ability to deal with any data subset!
  - Main consequence: possibility to make custom subsets
Custom data subsets

- Created by any user-defined criteria
- Example: wind data subsets
  - by wind speed categories (by intervals of wind speed)
  - by wind direction categories (by angular sections of direction – azimuth intervals)
- Results used for break diagnostics
Example: subsets categorized by wind speed

- **weak winds** (<2 m/s)
  - indicate changes of instrument sensitivity and friction

- **moderate winds** (2-4 m/s)
  - indicate changes of instrument close surroundings

- **strong winds** (>4 m/s)
  - indicate changes in station location or instrument orientation
Initial settings

Moving window length set is approx. average number of records for 3-year period
- original graphs in number of records’ scale
- better comprehension with time scale

Uneven response of corresponding RDI series as basic information for break diagnostics
Example: Niš, RDI series

Weak winds redirected – change of instrument close environment

Medium winds slightly redirected – change of instrument environment

Strong winds keep their distribution – station location preserved
Conclusions, endnotes

Advantages:
- enhanced diagnostics of detected breaks
- high precision in temporal scale

Disadvantages:
- time consuming process
- a lot of experience needed

Final questioning of the right choice for homogenization method
Thank you for being aware of the problem!