

## IDWP

Performs a temporally and spatially interpolation of precipitation data in order to get daily courses of precipitation data for climate stations which data are given as 12-hour or 24-hour precipitation sums. Required input data are both, the high resolution hourly precipitation data as well as the 12-hour and/or 24 hour low resolution precipitation data of as much stations as available. The precipitation of the high resolution data are interpolated to the locations of the low resolution data. Then, the results are weighted on the total sums of these low resolution data according to the matching period. This process is described in detail in the following paragraphs.

The interpolation is done in two steps. During the first step, the precipitation of the high resolution data is interpolated to the location of the conventional climate stations using inverse distance weighting interpolation (IDW). Some parameters have to be entered by the user, like the power of the inverted distance  $p$  in equation (4) and the maximum search radius for valid station data around the location of interpolation  $d_{max}$ . Furthermore, it is possible to specify fix upper and lower limits which should not be exceeded by the results. If this should happen such unwanted results are replaced by user specified default values, e.g. for precipitation values below  $0.1 \text{ mm}\cdot\text{h}^{-1}$ , which may be replaced by 0 mm in order to avoid too much and too long precipitation events due to the interpolation algorithm.

For each grid cell, all stations within the specified search radius around that cell are used for the interpolation. The weight parameter is used as exponent to calculate the power of the distance, which is then inverted in order to give more far stations a fare less weighting for the interpolation result. The sum of all inverse weighted distances is scaled to 1.0, the resulting scaling factor is then applied to each station weight and finally multiplied by the station data. The sum of all station data is the interpolation result.

After this interpolation of hourly values (7:00 to 7:00 of the next day) for the locations of the conventional climate stations, the 12-hour or 24-hour sums of the interpolated values are scaled to the observed sums, the resulting scaling factor is applied to each interpolated hourly value of the matching 12-hour resp. 24-hour interval.

The output file contains the original (e.g. 1-hour-values) values of the high resolution stations and the interpolated data of the conventional climate stations in the same temporal resolution. It can be used directly as an input file for the interpolation algorithms in WaSiM. The hourly input data have to be read in IDWP in  $1/10 \text{ mm}$ , the 12-hour and 24-hour data in mm. The result is given in  $1/10 \text{ mm/h}$ . The file names and parameters are specified interactively by the user or by an ASCII-file via redirected input.