

REFINE

REFINE is a powerful tool to change the grid properties like the cell size and the lower left coordinates, thus the tool can be used to synchronize two or more grids with respect to their coordinates and cell sizes. If any changes in the cell size and the coordinate origin of the grid are done, an interpolation is required. There are four methods provided, of which each has specific use cases:

1. Nearest-neighbor-method: For getting the value in the output grid, the nearest matching cell of the input grid is looked for and taken as result value. This method should be used if categorized data like land use or soil types should be converted into a finer grid resolution.
2. single bi-cubic interpolation: for each grid cell of the output grid a parabolic surface is constructed using that 3 x 3 window of the input grid which is nearest to the position of the actual output grid cell. The equation for the parabolic surface is given in the description of the program TANALYS (equation 142 and 143). The output value z is get by putting the actual x - and y -coordinates in equation 142. This method is fast and gives smooth surfaces, it can be used for continuous data like elevation models, slopes, aspects etc., but not for categorized data, which are not allowed to interpolate.
3. multiple bi-cubic interpolation: For getting even smoother transitions from cell to cell, not only one but up to four parabolic surfaces are constructed after equation Fehler: Referenz nicht gefunden. The 3 x 3 windows are centered on the four grid cells which are nearest to the actual output cell. If the output cell is exactly on a link between two input cells, then only two parabolic surfaces are constructed. The results of the four interpolations after Fehler: Referenz nicht gefunden are then weighted using the inverse distance weighting interpolation with distances depending on the location on the central cells of the up to four parabolic surfaces relative to the output cell location. This method is usually even more accurate than the single bi-cubic interpolation but like those method it cannot be used for categorized data (e.g. land use).
4. bicubic spline interpolation: for continuous data with best possible smoothness using a 3x3-moving window.

Command: refine <ingrid> <outgrid> [<method(1, 2, 3 or 4)>] [<xll>] [<yll>]

<method> is one of the above described methods for interpolation. <xll> and <yll> are the new coordinates of the lower left corner of the output grid. The last three parameters are optional, the default values are method 4 and the coordinates of the input grid.

The program asks interactively for the new cell size, which may be any size. The new number of rows and columns is calculated considering also new origin coordinates. If the output grid cell size is much larger then the input grid cell size it is recommended to use the program RESAMPLE or a combination of RESAMPLE and REFINE to get the best results. The method for generating aggregated values used in RESAMPLE gives usually better results when converting a grid into a coarser raster. If, for example, a 50 m grid should be converted into a 70 m grid, it should be converted in a first step into a 35 m grid and then an aggregation using RESAMPLE should be performed to get the 70 m grid.