[B, RasterRef [,fillvalue, RefMatrix]] = rasterReprojection(A,InR,InProj,OutProj [,Name/Value pairs] )

Reprojects raster from a projected, geographic, or geolocated raster (2D or 3D) to a different projection or geographic raster, or to the same projection with a different cell size

(there is no option for output geolocated raster).

INPUT

A - input raster (2D or 3D), any numeric type, or logical

InR - raster reference (geographic or mapping) for A. InR must be empty if input data are geolocated, in which case lat-lon grids are specified below.

InProj - input projection structure, [] if geographic or geolocated

OutProj - output projection structure, [] if geographic

OPTIONAL INPUT

name-value pairs, case-insensitive, abbreviations of 3 or more letters generally work, in any order specifying:

'planet' - planet name as a character string, case insensitive, defaults to 'earth'

'hemisphere' - specify if input image is entire northern or southern hemisphere or whole planet, choices are 'north', 'south', or ‘both' or 'whole'

'method' - interpolation method, options when input data are gridded (i.e. when InR is specified) are 'linear' (default), 'nearest' (fastest), 'cubic', 'spline', or 'makima'; options when input data are geolocated are 'linear' (default), 'nearest', or 'natural' (if input data are logical or categorical, interpolation is 'nearest')

'rasterref' - output raster reference object, mapping or geographic (this option allows output to exactly match another known image, for example if fitting an elevation model to a satellite image frame)

'latitude' and 'longitude' - needed when input A data are geolocated (irregularly spaced cells, for example swath satellite data) matrices of latitude and longitude, same size as first 2 dimensions of A (if input irregularly spaced data are in projected coordinates, convert to lat-lon)

'fillvalue' - output value for the cells that do not fall within the projection boundaries, or that are of unknown value in the input raster (defaults are NaN for floating point, minimum for signed integers, maximum for unsigned integers, or you can specify a value)

The following arguments are ignored if 'rasterref' option is used

'pixelsize' - either a 2-element vector specifying height and width of output cells, or a scalar if height=width (default is to approximately match the cell size of input raster)

'XLimit' and 'YLimit' - each vectors of length 2: minimum & maximum of output x- and y-coordinates (default is to cover extent of A)

'Origin' - 'ul' (upper left, default unless 'rasterref' specified), other options are 'll', 'ur', or 'lr'

'adjust' - true or false to adjust x- and y-limits to be a multiple of the pixelsize (default true unless 'rasterref' specified, in which case default is false)

'cells' - true or false to specify whether inputs are cells or postings (default true, also ignored if InR is a raster reference)

OUTPUT

B output reprojected raster, same class as input A

RasterRef raster reference object for B (if you want a referencing matrix, use the optional output)

Optional OUTPUT, in order

fillvalue - especially useful if input data are not floating point and you want to convert them to floating point

RefMatrix - referencing matrix