# Align Rasters

## Summary

The algorithm aligns one or more rasters to a reference raster. The aligned rasters will adopt the CRS, cell size, and origin of the reference raster. The aligned rasters will be saved as TIFF files.

## Input Parameters

### Reference Raster

The raster used for determining the CRS, cell size, and origin coordinates of the output rasters. If the reference raster has non-square pixels, the aligned raster pixel sizes will be the smallest length.

### Rasters to Align

The rasters that will be aligned to the reference raster.

### Resampling Method

The resampling method used for determining the value of aligned rasters' pixel value. The algorithms are identical to the algorithms executed in GDAL Warp.

### Clipping Extent [optional]

The extent the aligned rasters will be clipped to. Smaller raster extents will decrease file size and processing time for later components. Thus, it is suggested the rasters be clipped to the area of interest of the project. Common intputs would include a watershed or county boundary.

If this is not set, the aligned rasters will be clipped to the extent of the Reference Raster.

### Clip Buffer [optional]

Buffer added around the Clipping Extent. A small buffer around the project area of interest may increase the accuracy of drainage algorithms.

If the Clipping Extent is not set, no buffer will be applied.

## Outputs

### Output Directory

The output directory the aligned rasters will be saved to. The aligned rasters will share the name of their source files. If more than one raster share the same source name, numbers will be added to the end in the order they are processed.

# Rasterize Soil

## Summary

Soils data are used to estimate sediment loads. Two soil parameters are needed: the hydrologic soils group, which is a measure of how permeable the soils are; and the K-factor, which is a measure of how erodible the soils are. This information can be obtained from the Soil Survey Geographic (SSURGO) database, an archive of county-level soil data for most of the United States, maintained by the USDA Natural Resource Conservation Service. This is an excellent first (and generally last) place to look for county-level soils data.

The algorithm converts a vector polygon layer into Hydrologic Soul Group and/or K-Factor rasters. The value of the raster pixels is determined by the vector layer's attributes.

## Input parameters

### Soil Layer

Vector layer representing the soil properties.

### Hydrologic Soil Group Field

Field of the Soil Layer representing the hydrologic soil group (HSG). The picklist values comes from the fields in the Soil Layer. This will default to 'hydgrpdcd' if it is present in the Soil Layer. If this is left emtpy, no HSG raster will be created.

### K-Factor Field

Field of the Soil Layer representing the K-Factor. The picklist values comes from the fields in the Soil Layer. This will default to 'kffact' if it is present in the Soil Layer. If this is left emtpy, no K-Factor raster will be created.

The only valid values for this field are 'A', 'B', 'C' , 'D', 'A/D', 'B/D', 'C/D', 'W', and Null. If the field contains any values other than these, the tool will terminate without output.

### Raster Cell Size

The cell size of the output raster(s). The units will default to the units of the CRS of the Soil Layer.

## Outputs

### Hydrologic Soil Group Raster

The output location of the Hydrologic Soil Group raster. The raster will inherit the CRS of the Soil Layer.

### K-Factor Raster

The output location of the K-Factor raster. The raster will inherit the CRS of the Soil Layer.