



# Georeferencing an Image

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# Using Geometry Templates

- When OSSIM opens an image, it always checks to see if there is an external geometry file
- This geometry file defines the information necessary for OSSIM to calculate the latitude / longitude of each pixel
- These files are simple text documents
- `ossim\trunk\ossim\etc\templates`
  - `bilinear_projection_template.geom`
  - `utm_projection_template.geom`
  - `geographic_projection_template.geom`

# Process for Georeferencing an Image

- Copy a template
- Rename the template to have the same name as your image, but with a .geom extension and place it in the same directory as your image
  - I.e. If your image is called **image.png**, you would name the geometry file **image.geom**
- Fill in the projection information required by the template
  - At this point we could open the image in OSSIM and it would be georeferenced, but it would only be georeferenced in OSSIM applications
- Use `ossim-icp.exe` to convert the image to an image with the georeference information stored inside

# Process for Georeferencing an Image

- `ossim-icp.exe` is used to convert images between different datatype supported by OSSIM
- In our case, we are using it to convert `image.png` to a geotiff called `image.tiff`
- With the examples images provided above we would use the following command for `ossim-icp.exe` to create a geoTiff
  - `ossim-icp.exe tiff_tiled image.png image.tiff`
- `image.tiff` would be our final georeferenced product

# Bilinear Projection Template

- With only the four corners of the image, you can use this template to georeference your image
- This is the easiest template to implement
- Test it with barcos.png

# Bilinear projection template

```
//-----  
// $Id: bilinear_projection_template.geom 7662 2005-06-15 16:36:23Z dburken $  
//  
// Description:  
// This is a keyword list with minimum set of key words to make an  
// ossimBilinearProjection.  
//  
// NOTE:  
// The dpt's are in image space(x, y)  
//  
// The gpt's are in decimal degrees (latitude, longitude, height, datum)  
//  
// gpt0 should correspond to dpt0.  
//  
// It is best to have at least the four corners of the image.  
//-----  
dpt0: ( 0.0, 0.0)  
dpt1: ( 2047.0, 0.0 )  
dpt2: ( 2047.0, 2047.0 )  
dpt3: ( 0.0, 2027.0 )  
gpt0: ( 37.0, -117.0, 0.0, WGE )  
gpt1: ( 37.0, -116.0, 0.0, WGE )  
gpt2: ( 36.0, -116.0, 0.0, WGE )  
gpt3: ( 36.0, -117.0, 0.0, WGE )  
type: ossimBilinearProjection
```

# Other Projections

- The other projections have more complex template files, but can still be used to georeference an image
- Two more examples of templates follow



# UTM Projection Template

```
//-----  
// $Id: utm_projection_template.geom 9465 2006-08-28 18:53:59Z dburken $  
//  
// Description:  
// This is a keyword list with minimum set of key words to make an  
// ossimUtmProjection.  
//-----  
central_meridian: -87.00000000000000  
datum: WGE  
ellipse_code: WE  
ellipse_name: WGS 84  
false_easting_northing: ( 500000.0000000000000000, 0.0000000000000000 )  
false_easting_northing_units: meters  
hemisphere: N  
major_axis: 6378137.0000000000000000  
minor_axis: 6356752.314199999906123  
origin_latitude: 0.0000000000000000  
pixel_scale_units: meters  
pixel_scale_xy: ( 5.0, 5.0 )  
  
// point(tie center of pixel) or area (tie upper left corner of pixel).  
pixel_type: point  
  
tie_point_units: meters  
tie_point_xy: ( 138425.0, 4738765.0 )  
type: ossimUtmProjection  
zone: 16
```

# Geographic Projection Template

```
• //-----
• // $Id: geographic_projection_template.geom 20209 2011-11-04 15:21:37Z dburken $
• //
• // Description:
• // This is a keyword list with minimum set of key words to make an
• // ossimEquDistCylProjection (commonly called geographic).
• //
• // NOTE:
• // If decimal_degrees_per_pixel_lat equals decimal_degrees_per_pixel_lon then
• // your origin_latitude should be 0.0 or at the equator. If not, the
• // decimal_degrees_per_pixel_lon =
• // decimal_degrees_per_pixel_lat * cos(fabs(origin_latitude))
• //-----
• central_meridian: 0.0
• datum: WGE
• ellipse_code: WE
• ellipse_name: WGS 84
• false_easting_northing: ( 0.000000000000000, 0.000000000000000 )
• false_easting_northing_units: meters
• origin_latitude: 0.0
• pixel_scale_units: degrees
• pixel_scale_xy: ( 0.0666666667, 0.0666666667 )
• // point(tie center of pixel) or area (tie upper left corner of pixel).
• pixel_type: point
• tie_point_units: degrees
• tie_point_xy: ( -91.416731292574454, 42.792911858047304 )
• type: ossimEquDistCylProjection
```

# ossim-icp.exe Documentation

Usage: ossim-icp.exe [options] <output\_type> <input\_file> <output\_file>

## Description:

ossim-icp.exe copies any supported input image format to any supported output image format format

## Options:

- disable-elev            Will disable the elevation
- disable-notify        Takes an argument. Arguments are ALL, WARN, NOTICE, INFO, FATAL, DEBUG. If you want multiple disables then just do multiple --disable-notify on the command line. All argument are case insensitive. Default is all are enabled.
- disable-plugin        Will disable the plugin loader
- filter-spec <fname>    This is an external file spec that describes a chain for filtering the input image.
- ossim-logfile        takes a logfile as an argument. All output messages are redirected to the specified log file. By default there is no log file and all messages are enabled.

# ossim-icp.exe Documentation

- pixel-type <type>      Valid values: area or point, this will determine if the tie point is upper left corner of the upper left pixel (area) or the center of the upper left corner (point), default=point. NOTE: This option will only affect the tiff writer.
- reader-prop <string>      Adds a property to send to the reader. format is name=value
- use-mask [<fname>]      Optionally specify name of mask file to use for masking the input image. If no filename given, then the default mask filename is used.
- writer-prop <string>      Adds a property to send to the writer. format is name=value
- K      specify individual keywords to add to the preferences keyword list: name=value
- L or --end-line <n>      Which end line do you wish to copy from the input. If none is given then max line is used

# ossim-icp.exe Documentation

- P specify a preference file to load
- T specify the classes to trace, ex:  
ossimInit|ossimImage.\*  
will trace ossimInit and all ossimImage  
classes
- V or --version Display version information.
- a or --use-scalar-remapper Uses scalar remapper, transforms to 8-bit
- b or --bands <n,n...> uses the specified bands: ex. "1, 2, 4" will  
select bands 1 2 and 4 of the input image.  
Note: it is 1 based
- c or --compression-type <type> Uses compression. Currently valid for only  
tiff output -c jpeg will use jpeg compression
- e or --entry <n> For multi image handlers which entry do you  
wish to extract
- h or --help Display this information
- l or --start-line <n> Which start line do you wish to copy from the  
input. If none is given then 0 is used
- o or --create-overview Creates and overview for the output image

# ossim-icp.exe Documentation

- p or --end-sample <n>      The end sample you wish to copy from the input. If none is given then max sample is used
- q or --compression-quality <n>    Uses compression. Valid for jpeg type. default is 75 where 100 is best and 1 is worst
- r or --res-level <n>      Which res level to extract from the input: ex  
-r 1 will get res level 1
- s or --start-sample <n>      Which start sample do you wish to copy from the input. If none is given then 0 is used
- t or --create-thumbnail <n>    Takes an argument which is the maximum pixel dimension desired.
- w or --tile-width <n>      Defines the tile width for the handlers that support tiled output

# ossim-icp.exe Documentation

- Valid output writer types:
- tiff\_strip, tiff\_strip\_band\_separate, tiff\_tiled, tiff\_tiled\_band\_separate, jpeg, general\_raster\_bip, general\_raster\_bil, general\_raster\_bsq, general\_raster\_bip\_envi, general\_raster\_bil\_envi, general\_raster\_bsq\_envi, nitf\_block\_band\_separate, nitf\_block\_band\_sequential, nitf20\_block\_band\_separate, nitf20\_block\_band\_sequential, gdal\_VRT, gdal\_GTIff, gdal\_NITF, gdal\_HFA, gdal\_ELAS, gdal\_AAIGrid, gdal\_DTED, gdal\_PNG, gdal\_JPEG, gdal\_MEM, gdal\_GIF, gdal\_XPM, gdal\_BMP, gdal\_PCIDSK, gdal\_PCRaster, gdal\_ILWIS, gdal\_SGI, gdal\_SRTMHGT, gdal\_Leveller, gdal\_Terragen, gdal\_HDF4Image, gdal\_ERS, gdal\_FIT, gdal\_RMF, gdal\_RST, gdal\_INGR, gdal\_GSAG, gdal\_GSBG, gdal\_R, gdal\_PNM, gdal\_ENVI, gdal\_EHdr, gdal\_PAux, gdal\_MFF, gdal\_MFF2, gdal\_BT, gdal\_IDA, gdal\_USGSDem, gdal\_ADRG, gdal\_BLX, dal\_GeoRaster, , gdal\_KMLSUPEROVERLAY, gdal\_SAGA