# Instructions for Reprojecting MDOQ Tiles And MrSID Compressed County Mosaics

# Prepared by the Digital Section, Geospatial Services Branch Aerial Photography Field Office

# April 7, 2004

- Part 1: Instructions for reprojecting MDOQ Tiles and MrSID images "On The Fly" using ArcGIS 8.3
- Part 2: Instructions for reprojecting MDOQ Tiles by converting to an ESRI Grid using ArcGIS 8.3

# Part 1

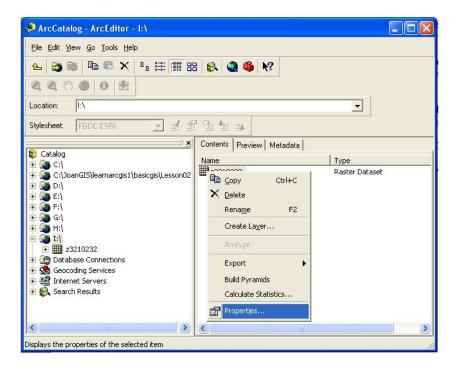
# Instructions for reprojecting MDOQ Tiles and MrSID images "On The Fly" using ArcGIS 8.3

The MDOQ Tiles and the MrSID compressed county mosaic are projected according to what zone the county falls in. There are counties that are split between two zones. If this situation occurs, the county is projected in the zone where the majority of the imagery lies. Therefore, the county Tiles and MrSID are created in this zone. There may be situations when it is useful to have the MDOQ Tiles and MrSID projected in the other zone.

There are several ways to reproject imagery in ArcGis. One method is to reproject the image on the fly. This method is fairly straightforward and accomplished easily. You may save your work in an .mxd file to reference later but you will be unable to permanently reproject the image and save it. To do this you would need to use another method which is to turn the image into a grid.

The following instructions pertain to reprojecting on the fly using ArcGIS 8.3.

- 1. First bring up your image in ArcMap. You may either use the CD or you can load the image on the hard drive of your computer. Loading the image on the hardrive of the computer will help things draw up faster if you have a slower computer.
- 2. Open ArcCatalog and navigate to the image file name and Right-click on the file (Figure 1).



Click on *Properties* and the *Raster Dataset Properties* Dialog opens up (Figure 2). If the *Spatial Reference* tab is not already active click on it.

le <u>E</u> dit	Raster Dataset Properties	
- 😂	General Spatial Reference	1
2 Q	Top: 3614503.000000	
cation:	Left: 205538.000000 Right: 219278.000000	
ylesheet	Bottom: 3599377.000000	
Catalo	Projection	
ि व ि व	Transverse_Mercator All False_Easting: 500000.0000000	
🔕 D: 🔕 E:	False_Northing: 0.000000 Central_Meridian: -99.000000 Scale Factor: 0.999600	
💽 F:\	Latitude_0f_0rigin: 0.000000 GCS_North_American_1983	
िक H: 🏹 म:	Edit	
🗄 🎆		
🥳 Ge 🗐 Int		
Se Se		
200 B		

# Figure 2

Click on the *Edit*... button and the *Spatial Reference Properties* Dialog opens up. (Figure 3)

Coordinate System	1
Name: NAD	_1983_UTM_Zone_14N
Details:	
Parameters: False_Easting: False_Northing Central_Meridi. Scale_Factor: Latitude_Of_O Linear Unit: Met Geographic Coc	an: -99.000000 0.999600 rigin: 0.000000 er (1.000000)
Select	Select a predefined coordinate system.
Import	Import a coordinate system and X/Y, Z and M domains from an existing geodataset (e.g., feature dataset, feature class, raster).
New 🔻	Create a new coordinate system.
Modify	Edit the properties of the currently selected coordinate system.
Clear	Sets the coordinate system to Unknown.

This is where you define the spatial reference or what zone the image was originally made in. This needs to be done so that ArcMap can project the image on the fly correctly. When you first bring in an image to ArcMap, the spatial reference will most likely be listed as unknown. If you try to project on the fly starting with an unknown coordinate system then the image will not draw up correctly.

Next click on the *Select...* button and the *Browse for Coordinate System* dialog box comes up. Double click on the *Projected Coordinate Systems* Folder, then double click on the *UTM* folder, then *NAD* 83 and finally choose the Zone that the image was created in and click the *Add* button. (Figure 4)

Look in: 🔲 Nad 1983	· L 3	
NAD 1983 UTM Zone 10N.prj	NAD 1983 UTM Zone 19N.prj	BAD 1983 UTM Zone 7N
🛞 NAD 1983 UTM Zone 11N.prj	NAD 1983 UTM Zone 20N.prj	NAD 1983 UTM Zone 8N
🛞 NAD 1983 UTM Zone 12N.prj	NAD 1983 UTM Zone 21N.prj	NAD 1983 UTM Zone 9N
NAD 1983 UTM Zone 13N.prj	NAD 1983 UTM Zone 22N.prj	
NAD 1983 UTM Zone 14N.prj	NAD 1983 UTM Zone 23N.prj	
NAD 1983 UTM Zone 15N.prj	🛞 NAD 1983 UTM Zone 3N.prj	
NAD 1983 UTM Zone 16N.prj	NAD 1983 UTM Zone 4N.prj	
NAD 1983 UTM Zone 17N.prj	NAD 1983 UTM Zone 5N.prj	
NAD 1983 UTM Zone 18N.prj	NAD 1983 UTM Zone 6N.prj	
<		0
Name:		Add
Show of type: Spatial reference		Cancel

Figure 4

This brings you back to the *Spatial Reference Properties* box and here you can see that you have now defined the Spatial Reference (i.e. the correct UTM Zone) of the image. (Figure 5)

Spatial Reference	e Properties	
Coordinate System		
Name: NAD	1983_UTM_Zone_14N	
Details:		
False_Northing Central_Meridia Scale_Factor: ( Latitude_Of_Or Linear Unit: Mete Geographic Coo	– 500000,000000 n: -99,000000 0.999600 igin: 0.000000 er (1.000000)	
Select	Select a predefined coordinate sy	stem.
Import	Import a coordinate system and X. domains from an existing geodata: feature dataset, feature class, rast	set (e.g.,
New 🔻	Create a new coordinate system.	
Modify	Edit the properties of the currently coordinate system.	selected
Clear	Sets the coordinate system to Uni	known.
Save As	Save the coordinate system to a f	ile.
	OK Cancel	Apply

Now that you have defined the spatial reference of the image you can view the image in ArcMap in an alternate UTM Zone.

3. Return to your image in ArcMap. In the table of contents, right click either on *Layers* or right click directly in the *Data Frame*. This brings up the *Data Frame Properties* dialog box. (Figure 6) You can see the current coordinate system of the image in the lower half of the dialog box in the section titled *Select a Coordinate System*. You can change the zone to whatever alternate zone you want to view the image in. Click on the *Predefined* folder, then on the *Projected* folder, then on *UTM*, then *Nad* 83, and finally on whatever zone you would like. Then hit *OK* to close the *Data Frame Properties* Dialog Box. Your image is now projected to the zone you have chosen.

🔇 martin13 - ArcMap - Ar	rcEditor	
Eile Edit Yiew Insert S Da	ta Frame Properties	? 🛛
Editor	Annotation Groups   Extent Rectangles   Fr	ame Size and Position mination Grids Labels Clear
Display Source Drawing ▼	OK	Cancel Apply
Display the data frame's propertie	762	951.72 3609230.61 Meters

Figure 6

4. You may also save your project as an .mxd file to view later. Your settings will be saved for the project. Also if you are viewing the image from the CD Rom drive you will need to be sure the CD is loaded when you bring up your .mxd project or you will get an error saying the source is not available.

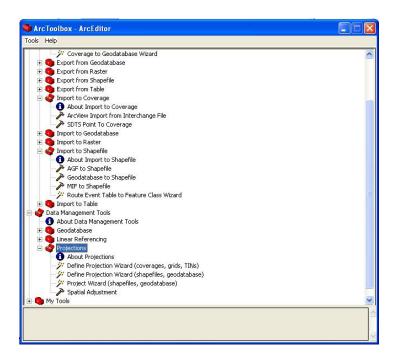
Another situation that is likely to happen is that you may need to bring in shapefiles to view with your image. If the Spatial Reference of a shapefile is not defined it will not draw up correctly.

## Defining the spatial reference for shapefiles

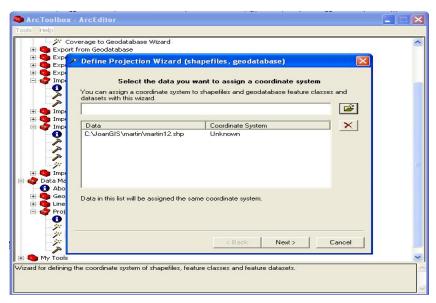
The following instructions are for defining the spatial reference for shapefiles using ArcGIS 8.3.

If you have already added the shapefile to ArcMap delete it from the project otherwise you will get an error message telling you that the file cannot be changed because it is in use.

1. Open up ArcToolbox and navigate to *Projections*, and expand the folder. Double Click on *Define Projection Wizard (shapefiles, geodatabase)*. (Figure 1)



The *Define Projection Wizard* dialog box comes up. Select the data you want to assign a coordinate system to by clicking on the open folder near the top of the box. Navigate to the file you want to use and click *add*. The file will show up under *Data* and the *Coordinate System* will say unknown. If *Coordinate System* does not say unknown, the projection has already been defined. Click the *Next* button. (Figure 2)



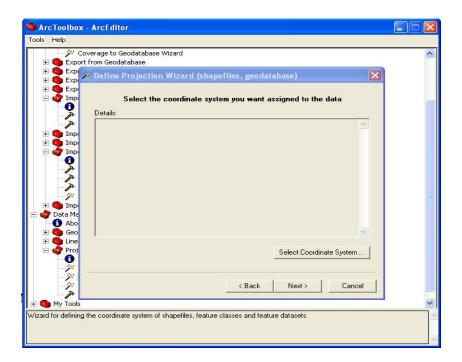


2. Now the *Spatial Reference Properties* Dialog comes up. Click on the *Select...* button. (Figure 3)

🍣 ArcToolbox - ArcEdi	Spatial Reference Properties	
Tools Help	Spanar Reference Properties	
Coverage to Export from Geo Exp Exp Exp Exp Exp Exp	Coordinate System Name: Unknown Details:	
Details:	Select Select a predefined coordinate system.	() ()
Data Me Abo Geo Line Yroj	Import       Import a coordinate system and X/Y, Z and M domains from an existing geodataset (e.g., feature dataset, feature class, raster).         New       Create a new coordinate system.         Modify       Edit the properties of the currently selected coordinate system.         Clear       Sets the coordinate system to Unknown.         Save As       Save the coordinate system to a file.	em
	OK Cancel Apply	

## Figure 3

3. Next the dialog box appears where you select the coordinate system. (Figure 4)



4. Now click on the *Select Coordinate System*... button. The *Spatial Properties Dialog* Box opens. Click on the *Select*... button, and *the Browse for Coordinate System* box comes up. (Figure 5)

Look in: 🔞	Coordinate Systems	-	د 🔁	الغماري	9-9- mm	00
Geographic	Coordinate Systems coordinate Systems				0-0- <u></u>	
Name:					Ad	4

#### Figure 5

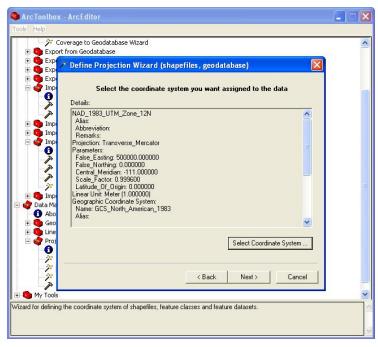
Double click on the *Projected Coordinate Systems* folder, double click the *UTM* folder, double click *NAD83*, and then select the appropriate zone. Click the *Add* button. (Figure 6)

Look in:	Nad 1983		<u>ک</u>		
🕲 NAD 1983 L	TM Zone 10N.prj	NAD 1983 UTM Zor	ne 19N.prj	NAD 19	983 UTM Zone 7N
🕲 NAD 1983 L	TM Zone 11N.prj	NAD 1983 UTM Zor	ne 20N.prj	@NAD 19	983 UTM Zone 8N
📴 NAD 1983 L	TM Zone 12N.prj	NAD 1983 UTM Zor	ne 21N.prj	(ONAD 19	983 UTM Zone 9N
🕲 NAD 1983 L	TM Zone 13N.prj	NAD 1983 UTM Zor	ne 22N.prj		
🕲 NAD 1983 L	TM Zone 14N.prj	NAD 1983 UTM Zor	ne 23N.prj		
🕲 NAD 1983 L	TM Zone 15N.prj	( NAD 1983 UTM Zor	ne 3N.prj		
🕲 NAD 1983 L	TM Zone 16N.prj	(In the second s	ne 4N.prj		
🕲 NAD 1983 L	TM Zone 17N.prj	( NAD 1983 UTM Zor	ne 5N.prj		
🕲 NAD 1983 L	TM Zone 18N.prj	NAD 1983 UTM Zor	ne 6N.prj		
<					2
Name:	NAD 1983 UTM	Zone 12N.prj			Add
Show of type:	Spatial reference			-	Cancel

5. The *Spatial Reference Properties* box again comes up and this time you see that the coordinate system has been defined. Click *OK*. (Figure 7)

oordinate Syste	m
Name: NAE	D_1983_UTM_Zone_12N
Details:	
Parameters: False_Easting False_Northin Central_Merid Scale_Factor: Latitude_Of_C Linear Unit: Me Geographic Co	ian: -111.000000 : 0.999600 Drigin: 0.000000
Select	Select a predefined coordinate system.
Import	Import a coordinate system and X/Y, Z and M domains from an existing geodataset (e.g., feature dataset, feature class, raster).
New +	Create a new coordinate system.
Modify	Edit the properties of the currently selected coordinate system.
	Sets the coordinate system to Unknown.
Clear	

6. The *Define Projection Wizard (shapefiles, geodatabase)* dialog box again comes up showing the Coordinate System you have just selected. If it is correct then click on the *Next* button. (Figure 8)



#### Figure 8

You are then given a summary of your input. (Figure 9)

	ary of your input	
nput Datasets: C:'JoanGIS\martin\martin12.shp NAD_1983_UTM_Zone_12N		^
Projected Coordinate System Alias: Abbreviation: Remarks: Projection: Transverse_Mercator Parameters: False_Easting: 500000.000000 False_Northing: 0.000000 Central_Meridian: -111.000000 Scale_Factor: 0.999600 Latitude_Of_Origin: 0.000000 Linear Unit: Meter (1.000000) Geographic Coordinate System:		

7. Then click the *Finish* button and your data is ready to use in ArcMap with your imagery.

To find out more about raster images and how to work with them in ArcGIS, see the ArcGIS help sections using the keyword searches raster, MrSID, and images. Another valuable resource available is the online support located at http://support.esri.com/. Here you will find technical articles, downloads, and user forums. This is one of the best resources available to get answers to ArcGIS questions.

# Part 2

# Instructions for reprojecting MDOQ Tiles by converting to an ESRI Grid using ArcGIS 8.3

There is a method which allows you to reproject raster images in ArcGIS, if you want to change the projection and save the image independently from an .mxd. This method requires you to change the .tif image into an ESRI Grid. An ArcInfo license is required to use this method so if you do not have this available then you will need to use Projection on the fly. Changing an image to an ESRI Grid can be a lengthy process. There are some limitations using this method of reprojection when you are working with MrSID images. Processing time is very lengthy and the image resolution can become degraded. The suggestion would be to use the MDOQ Tiles if you need to convert them to a GRID.

The following instructions are for ArcGIS version 8.3.

If your image is a black and white single band image skip step 3 and 4 and add your image directly into ArcMap.

 Open *ArcCatalog* and navigate to the raster image (MDOQ Tile). Right-click on the image and select *Export* > *Raster to Different Format*. Select *ESRI Grid* from the *Save as type* drop-down list (see Figure 1). A grid will be created for each band in the imagery.

Figure 1

Export Raste	rDataset 🛛 🗙
Look in: 🛅	matir 💽 🛌 💼 💼 📰 📰
Name:	z3210232test Save
Save as type:	ESRI GRID Cancel

This process may take a few minutes depending on the speed of your system and the size of the image. A small box will come up which tells you the raster image is being processed and indicates the progress. You also have the option to cancel.

2. Open *ArcToolbox* and use the *Project Wizard (coverages, grids)* to reproject each grid. Choose the grid in the next dialog box. (Figure 2) The dialog box shows you

what parameters are associated with the grid, so you don't try to project the image to the same zone as it was made in.

#### Figure 2

aset:		
joanGIS\martin\z	:3210232c1	<b>2</b>
he dataset are lis:		
Projection	UTM	
Projection Zone	UTM 14	
Projection Zone Datum	UTM 14 NAD83	
Projection Zone Datum Spheroid	UTM 14 NAD83 GRS80	
Projection Zone Datum Spheroid Units	UTM 14 NAD83 GRS80 METERS	
Projection Zone Datum Spheroid	UTM 14 NAD83 GRS80	

Click the *Next* > button and you have a choice of what projection you now want to use. (figure 3)

## Figure 3



Next you will choose the zone you want to project the image in. (Figure 4)

# Figure 4

	es, grids) e for each of the projection rameters below:	×
UTM parameters Units: Zone: X Shift (optional): Y Shift (optional):	meters	
Help	<back next=""> Cance</back>	el

Next you will choose the Datum you want the image in. (Figure 5)

# Figure 5



The next dialog that comes up asks you to specify an output dataset. (Figure 6)

Figure 6

Dataset:			
C:\joanGIS\martin\z1			<b></b>
Grid settings			
and seconds			
Resampling method:	Nearest	🔿 Bilinear	C Cubic
📃 Project will calculat	e a cellsize, Wou	ıld you rather	specify your own
Cell size:	_ r	neters	
🗖 Anchor grid origin t	to existing grid?		

Click the *Next* > button and you get a summary of your input projection and what output projection you have chosen. Click the *Finish* button and *ArcToolbox* processes your request. Repeat this procedure for each grid. This can be a very lengthy process if your system is slow.

- 3. Add each grid to ArcMap. The three output bands resulting from the conversion to grid will be named in the form <gridname>c1 <gridname>c2 <gridname>c3
- 4. Open the *Raster Calculator* which is located in the *Spatial Analyst Toolbar*. Use the following syntax where Stack1 is the name of the output grid:

MAKESTACK Stack1 LIST [Grid1] [Grid2] [Grid3]

An example is shown in Figure 7

z3210232c1 z3210232c2 z3210232c3	×	7	8	9	=	$\diamond$	And
2321023203	1	4	5	6	>	>=	Or
	-	1	2	3	<	<=	Xor
	+	[	0	1	t	)	Not
MAKESTACK St	acki LIST [z	3210232	c1][z3	210232c	2][z32	10232c	3]

Click *Evaluate*. If you get an error message concerning the output file click on the *Spatial Analyst Toolbar* and go under options and navigate to the working directory where you want the image. Most likely the image will draw up and the color will be off. To fix this Right-Click on STACK in the table of contents and go to *properties*, then click on the *Symbology* tab and under the *Stretch* drop down box click none and your image should draw up with the correct colors.

Reprojecting any raster image can be a lengthy and complicated process. To find out more about raster images and how to work with them in ArcGIS, see the ArcGIS help sections using the keyword searches raster, MrSID, and images. Another valuable resource available is the online support located at http://support.esri.com/. Here you will find technical articles, downloads, and user forums. This is one of the best resources available to get answers to ArcGIS questions.