

Procedure for Projecting and Transforming American Samoa GIS Data from Stateplane ASD62 to UTM NAD83.

This procedure has been developed in a joint effort between the United States National Geodetic Survey (NGS), the American Samoa Government Department of Commerce (DOC), and the United States National Park Service (NPS). The procedure is designed to convert GIS data in the American Samoa Stateplane Coordinate System and in the American Samoa Datum of 1962 (ASD62) to the Universal Transverse Mercator (UTM) Zone 2 South Coordinate System in the North American Datum of 1983 (NAD83). The process also produces copies of the GIS data in the Geographical Coordinate System for both the ASD62 and NAD83 datums. Users of this procedure will note that projections for files in the NAD83 datum are defined in the WGS84 datum using Arc Toolbox because ESRI software does not yet include a Zone 2 South projection file for the UTM coordinate system in the NAD83 datum (refer to part III). Tests conducted using highly accurate monument point data from the island of Tutuila in both Geographical and UTM coordinate systems (supplied by the NGS, NAD83 datum), displayed minimal error (millimeters) as a result of this conversion procedure. The small degree of error will be inconsequential for most applications.

The software required to perform the necessary operations includes ESRI® ArcView 3.2a™ and ArcToolbox 8.1™. The operator will also need the “Projector!” and “ShapeNADCON” tools (extensions) for ArcView. ArcView versions 3.1 and 3.2 should have included the “Projector!” utility as a sample extension. If necessary, copy the extension into the EXT32 folder.

From: C:\ESRI\AV_GIS30\ARCVIEW\Samples\ext\prjctr.avx

To: C:\ESRI\AV_GIS30\ARCVIEW\EXT32\prjctr.avx

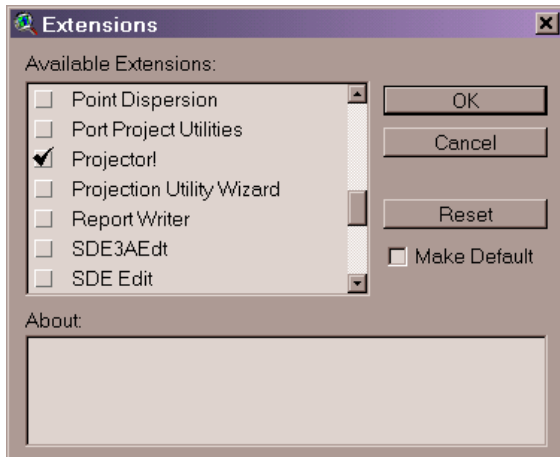
The “ShapeNADCON” extension was created by the NGS in 2001. Both extensions can be acquired by contacting the personnel in the GIS section of the DOC. Questions regarding the operation of this procedure can be directed to

kcronk@doc.asg.as .

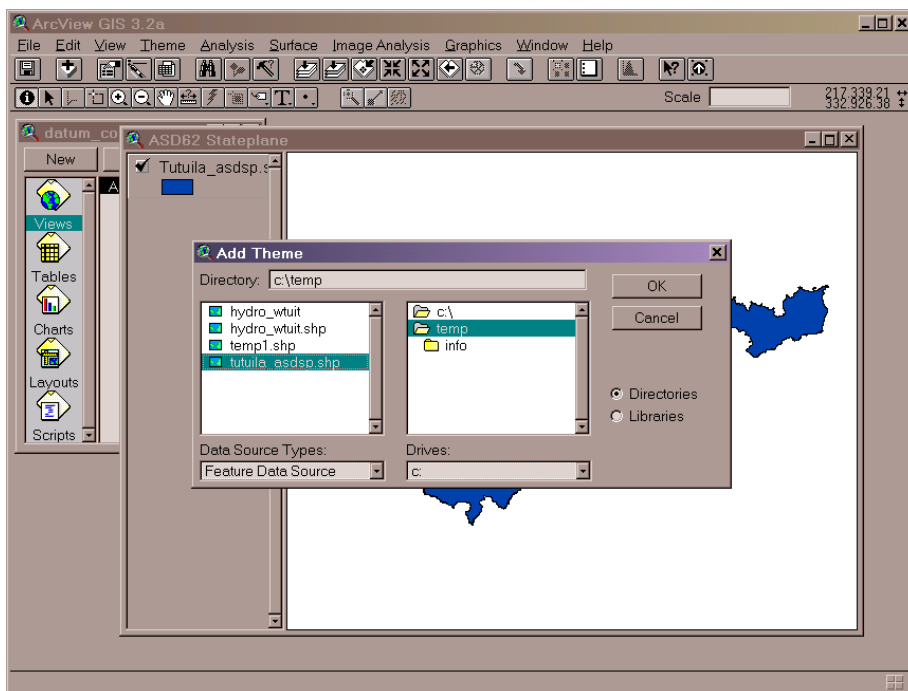
Procedure for Projecting and Transforming American Samoa GIS Data from Stateplane ASD62 to UTM WGS84.

Part I – Project shapefile from American Samoa Stateplane Coordinate System to Geographic Coordinate System (both in the American Samoa Datum of 1962):

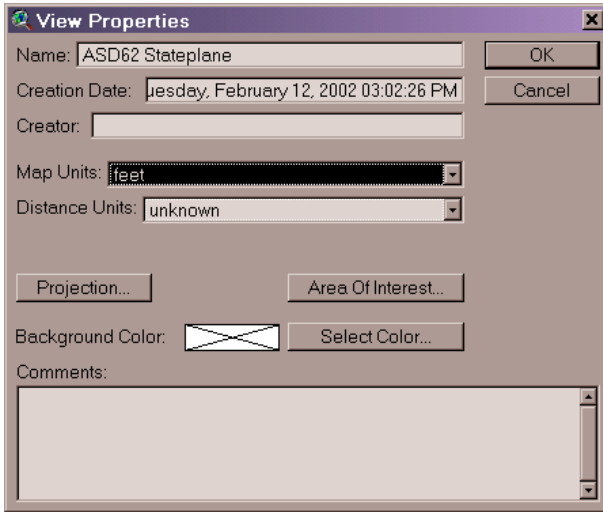
1. Open ArcView, go to “File” drop-down menu, select “Extensions”, scroll down and check “Projector!” tool extension, and click “OK”.




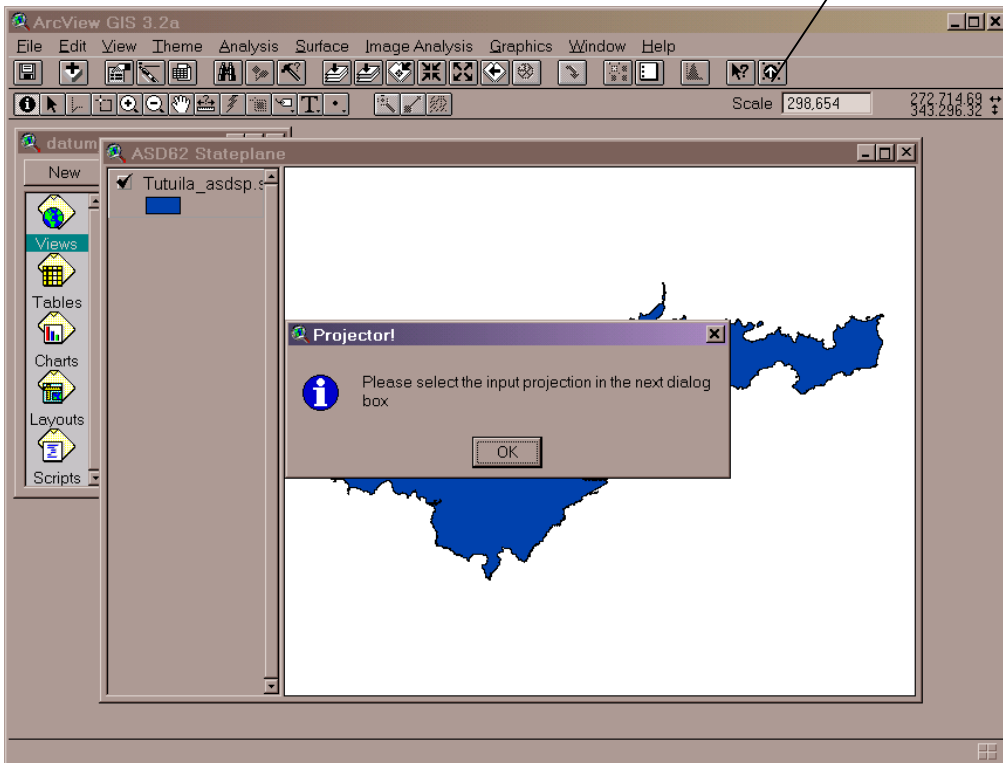
2. Go to “View” drop-down menu, click “Add Theme”, browse to directory containing shapefile in the Stateplane Coordinate System in the American Samoa Datum of 1962, select file, and click “OK”.



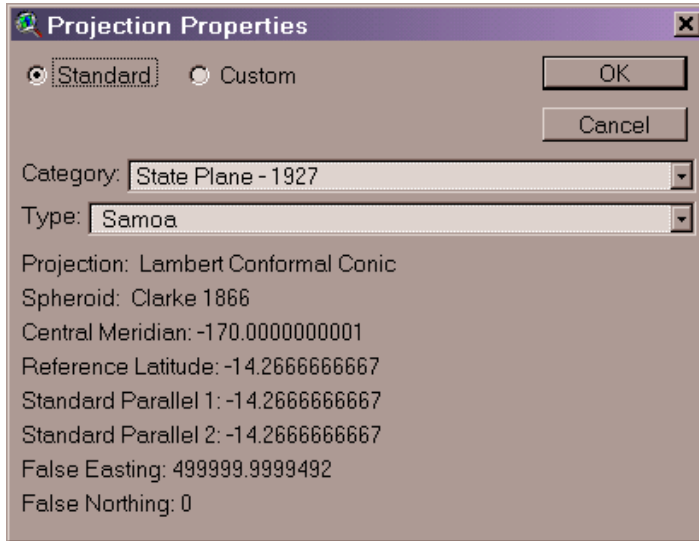
3) Go to the “View” drop-down menu, select “Properties”, set “Map Units” to feet, and click “OK”.



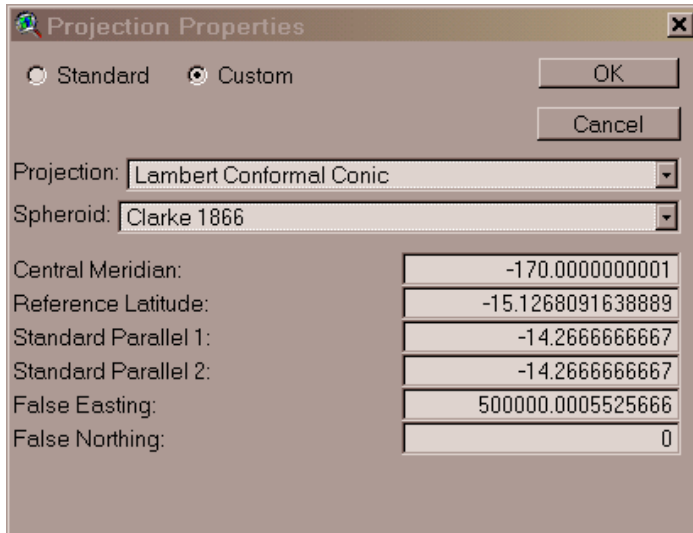
4. Make sure the theme is active, click on the “Projector!” button , and click “OK”.



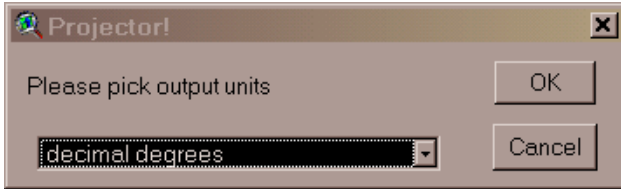
5. Select “Category: State Plane – 1927” and Select “Type: Samoa” and then click on the “Custom” radio button.



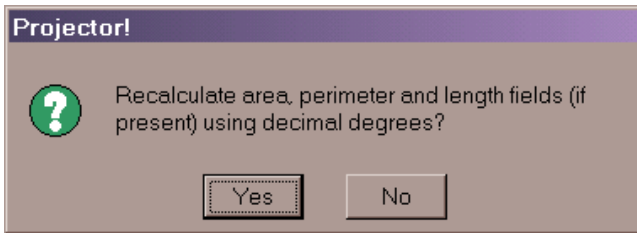
6. Change “Reference Latitude” to -15.1268091638889 and click “OK”.



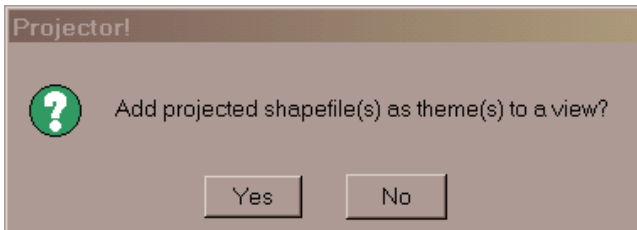
7. Pick output units - select “decimal degrees” and click “OK”.



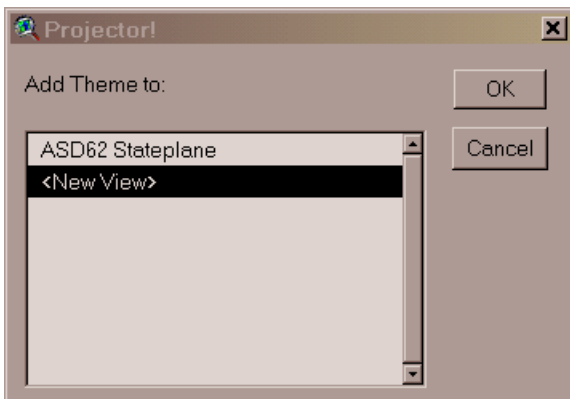
8. Recalculate area, perimeter....? Select “Yes”.



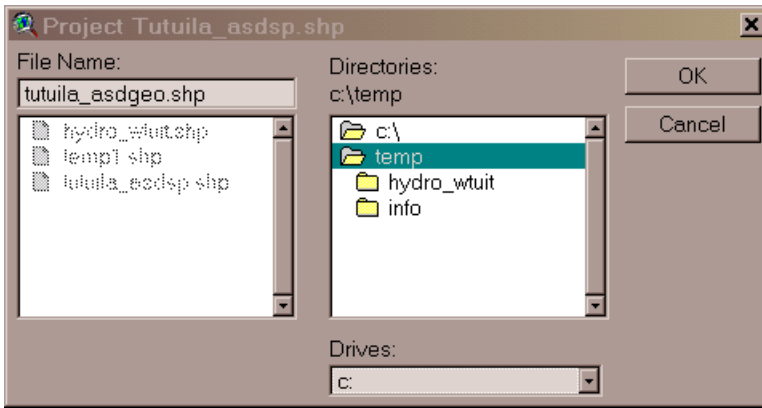
9. Add projected shapefile(s) as theme(s) to a view? Select “Yes”.



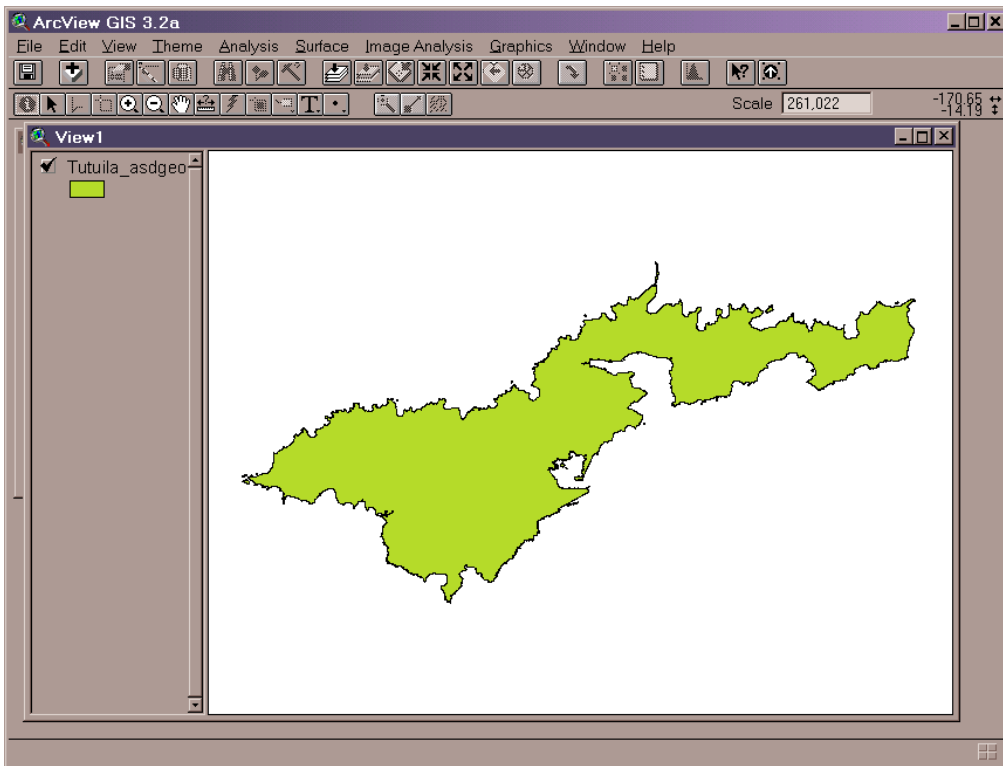
10. Add Theme to: select “<New View>” and click “OK”.



11. Browse to directory where you want to store the new shapefile (that will be in American Samoa Datum and the Geographic Coordinate System), give the shapefile an appropriate name, and click “OK”.

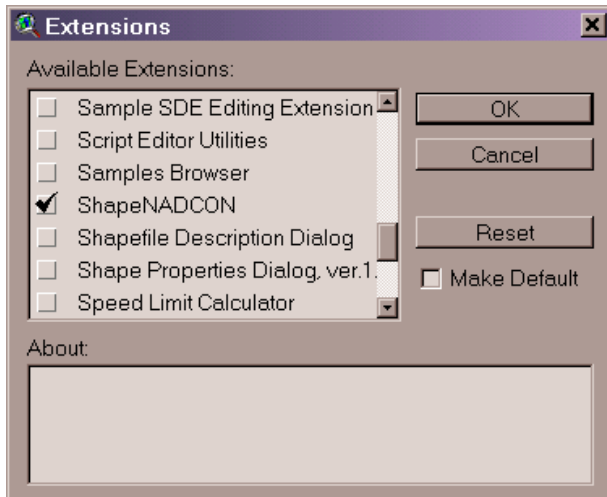



12. The new ASD62 Geographic shapefile will now appear in a separate view window.

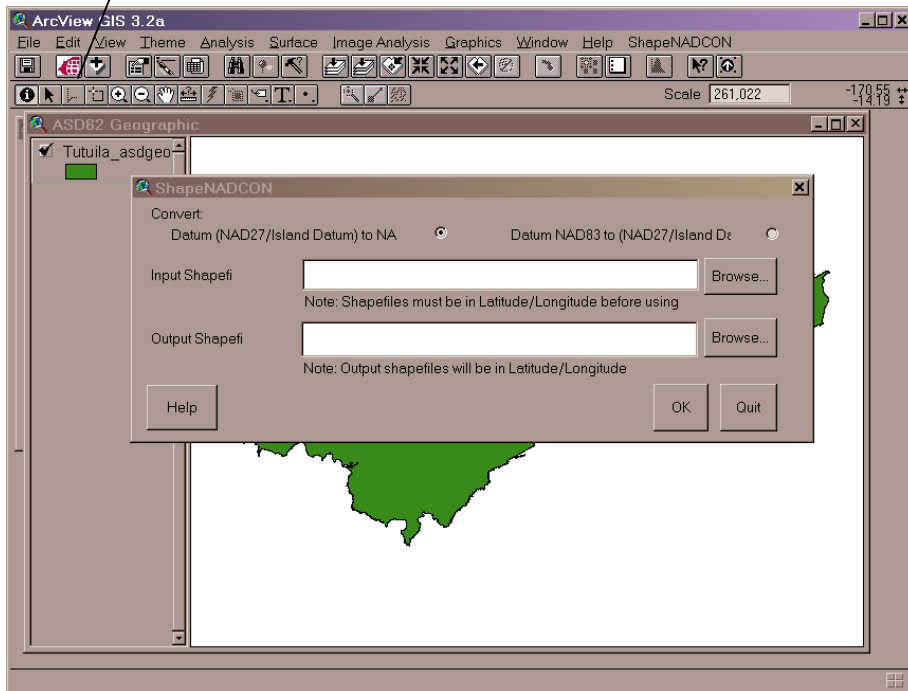


Part II – Convert shapefile from American Samoa Datum of 1962 (ASD62) to North American Datum of 1983 (NAD83):

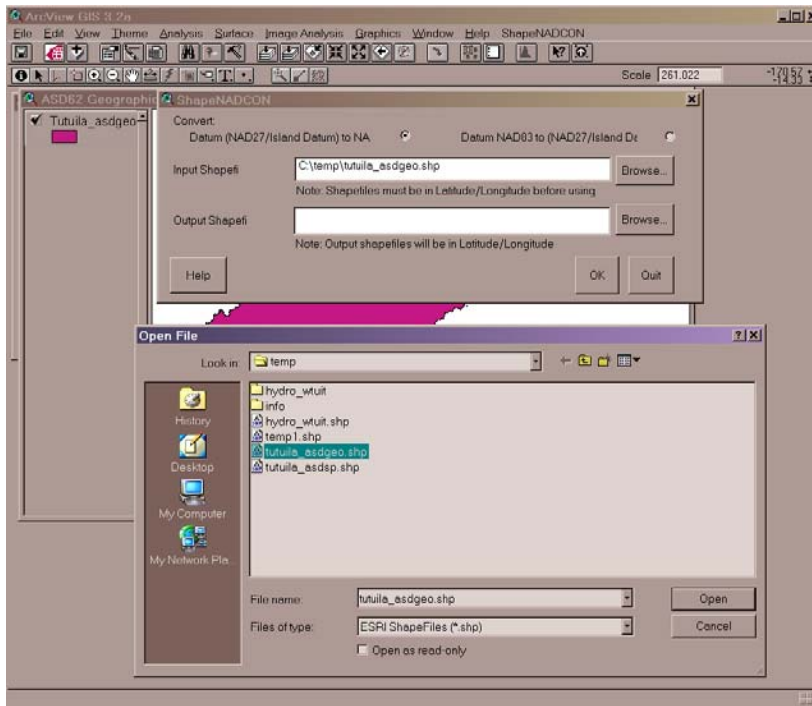
1. Open ArcView, go to “File” drop-down menu, select “Extensions”, scroll down and check “ShapeNADCON” tool extension, and click “OK”.



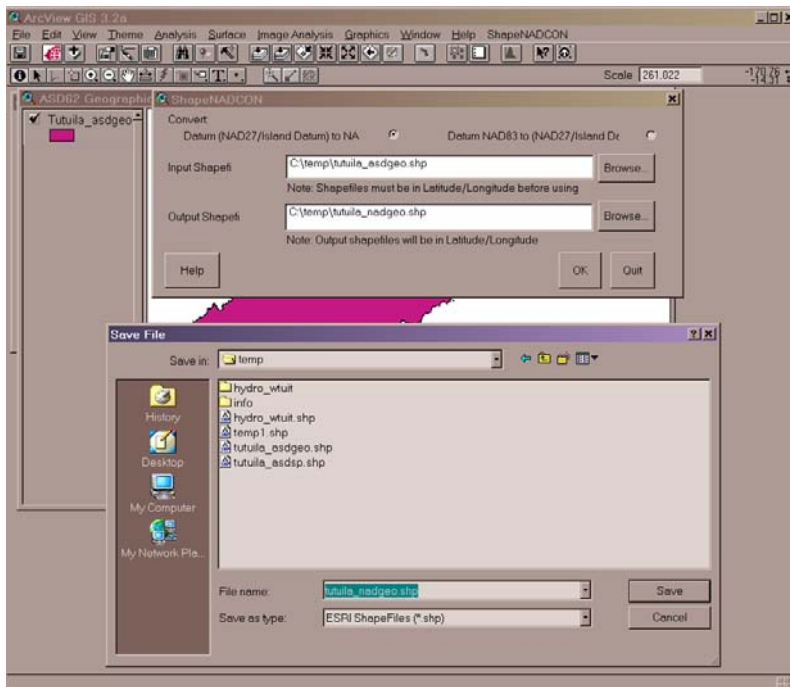
2. Open a view window (any view window will do) to make the “ShapeNADCON” button  active, click the button, and then click “OK”.



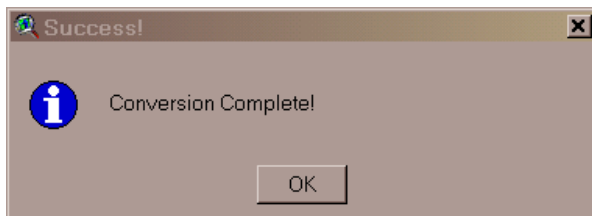
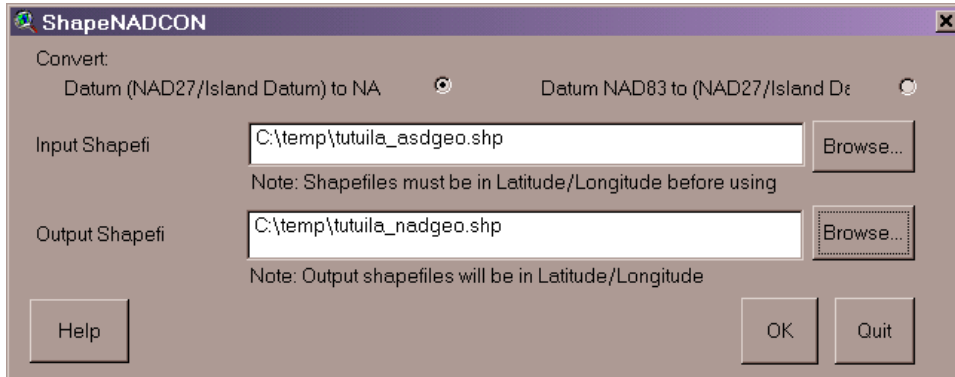
3. Click on the upper “Browse” button in the “ShapeNADCON” window, browse and select the ASD62 shapefile to be converted to NAD83.



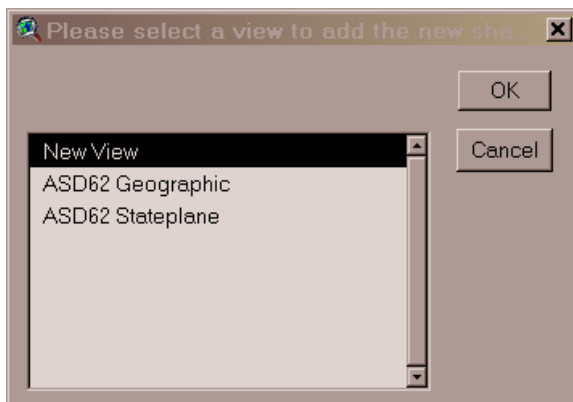
4. Click on the lower “Browse” button in the “ShapeNADCON” window, browse to the directory where the new NAD83 file will be stored, type an appropriate name for the shapefile into the “File name” box and click on “Save”.



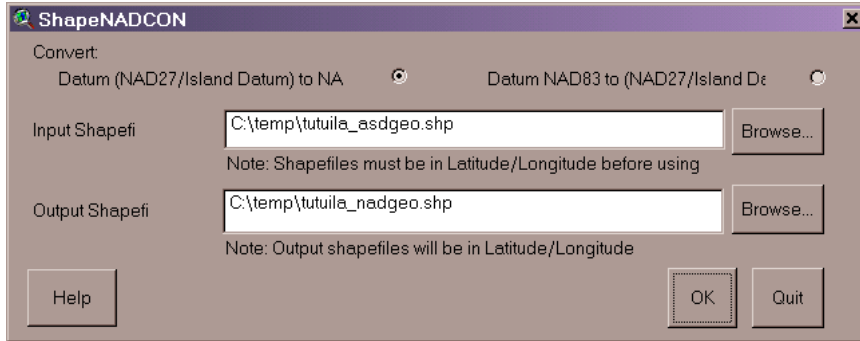
5. Ensure that the radio button “Datum (NAD27/Island Datum) to NAD83” is selected and click “OK”. Then click “OK” on the “Success!” message window.



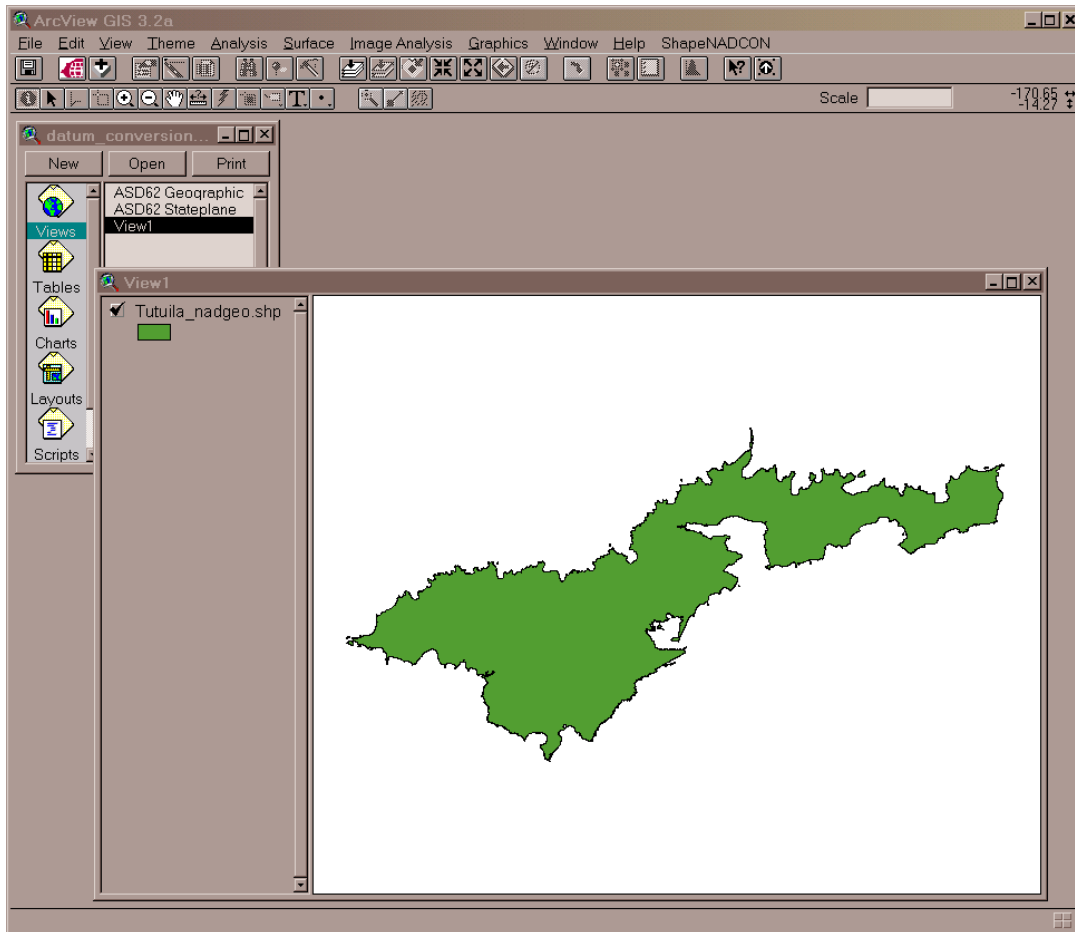
6. Select “New View” and click “OK”. Click “OK” on “Shapefile added” message window.



7. Click on the “Quit” button in the “ShapeNADCON” window.



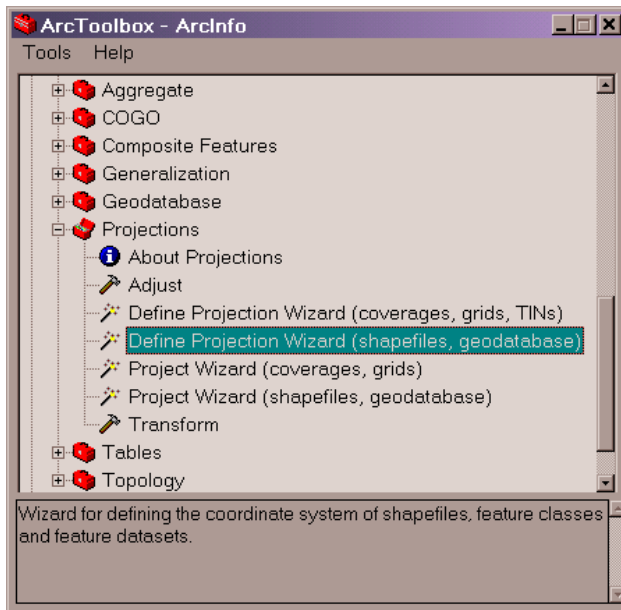
8. The new shapefile in NAD83 datum will appear in a new view window.




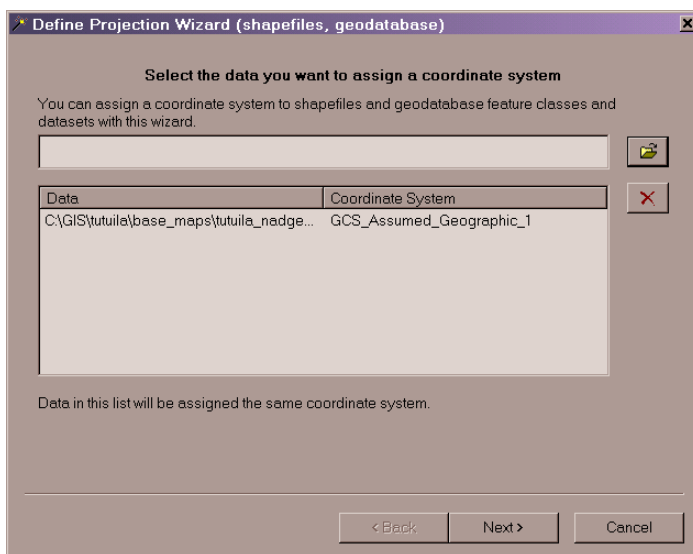
Part III – Project shapefile from Geographic Coordinate System to UTM Zone 2 South Coordinate System (both in the North American Datum of 1983):

Step 1: ‘Defining the Projection’

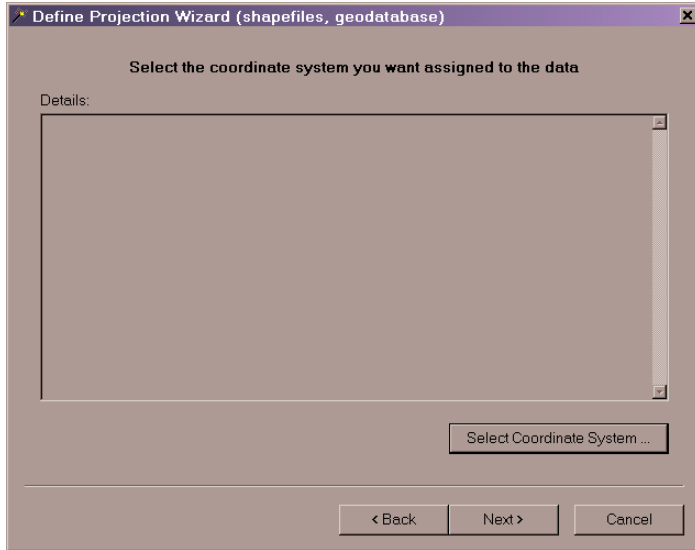
1. Open ArcGIS 8.1 ArcToolbox, click on “Projections”, and double-click on “Define Projection Wizard (shapefiles, geodatabase)”



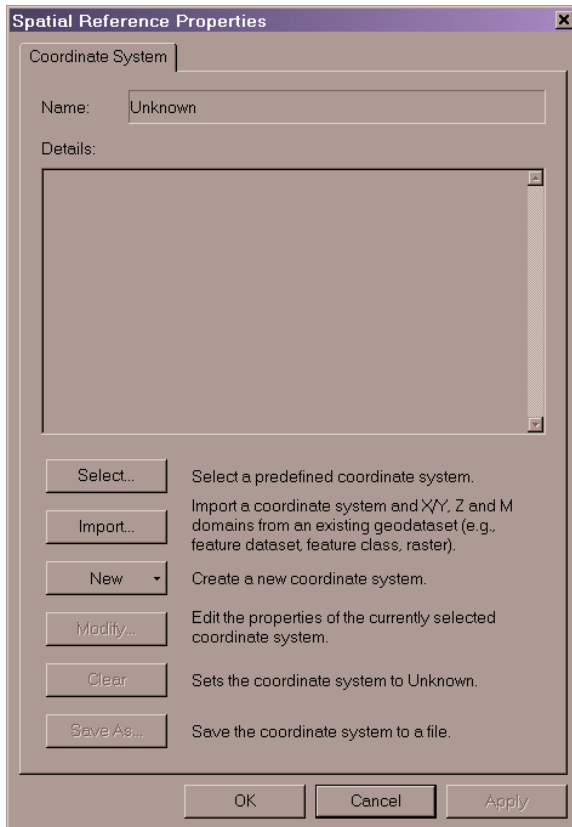
2. Click on “Browse” button  and select the desired shapefile in Geographical Coordinates and the NAD83 datum. Click “Next”.



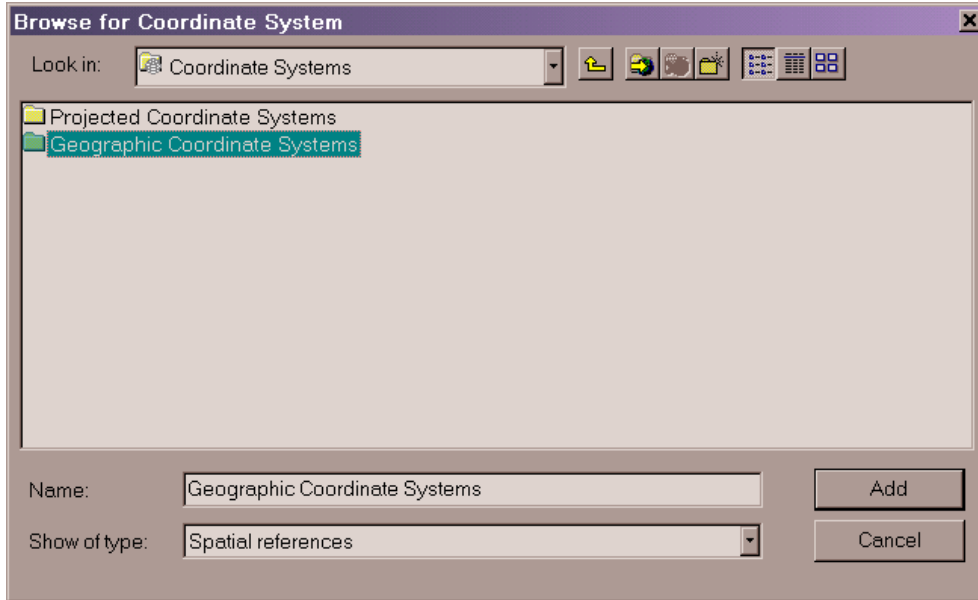
3. Click the “Select Coordinate System” button.



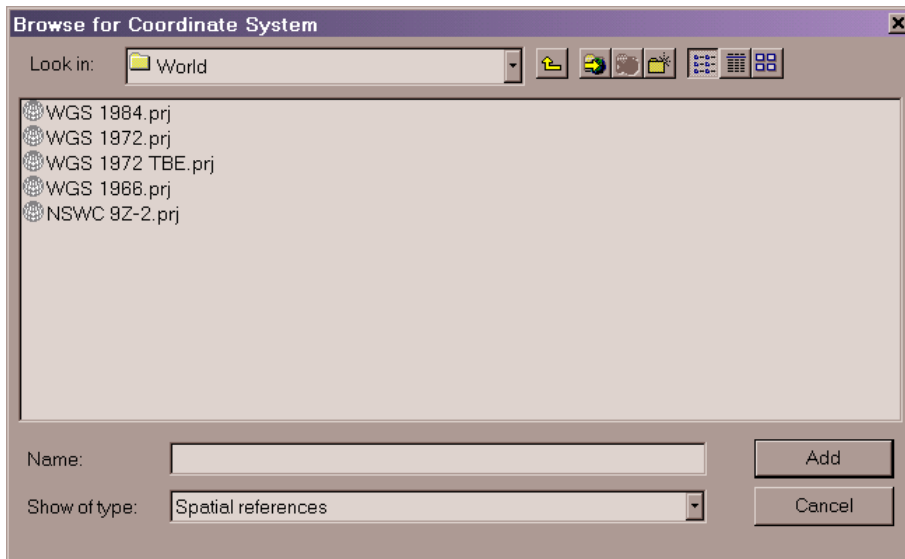
4. Click the “Select” button.



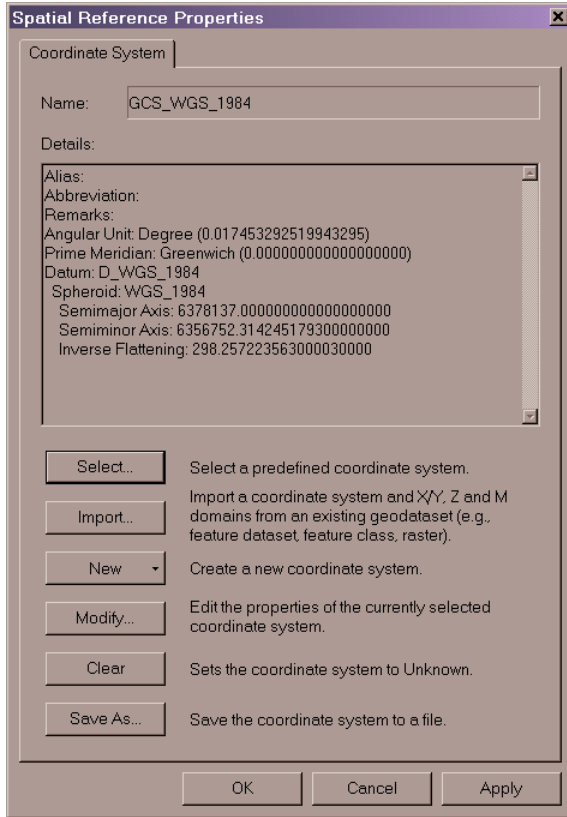
5. Select the “Geographic Coordinate System” folder.



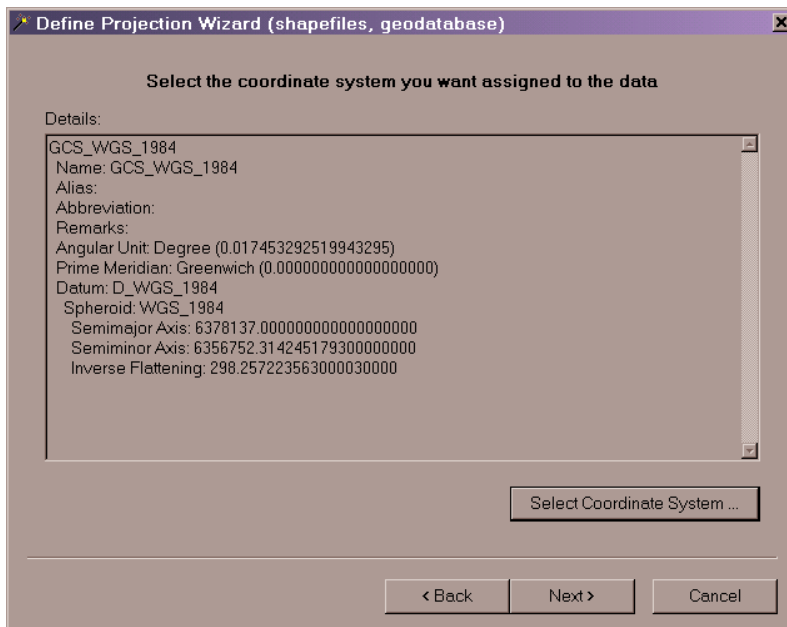
6. Click on “World” and then select “WGS 1984.prj”. Click “Add”.



7. Click “Apply” and then “Ok”.



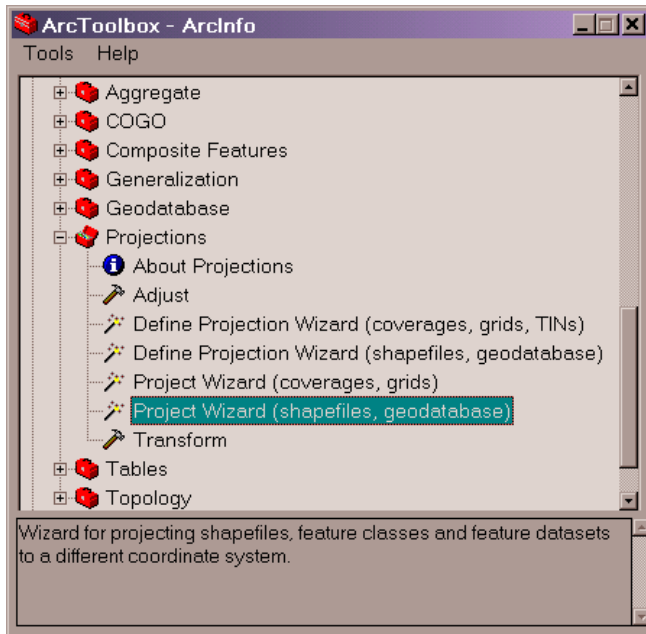
8. Click “Next” and then “Finish”.




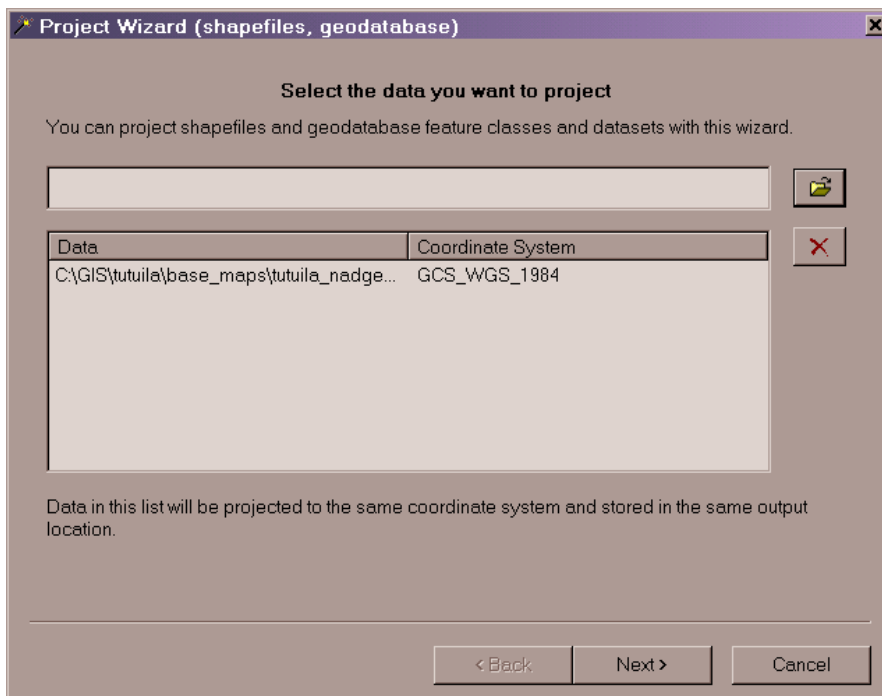
Part III - Step 2: “Project the data to UTM Zone 2 South WGS84*.”


*in reality, the data will be in the NAD83 datum (see author’s notes in the beginning).

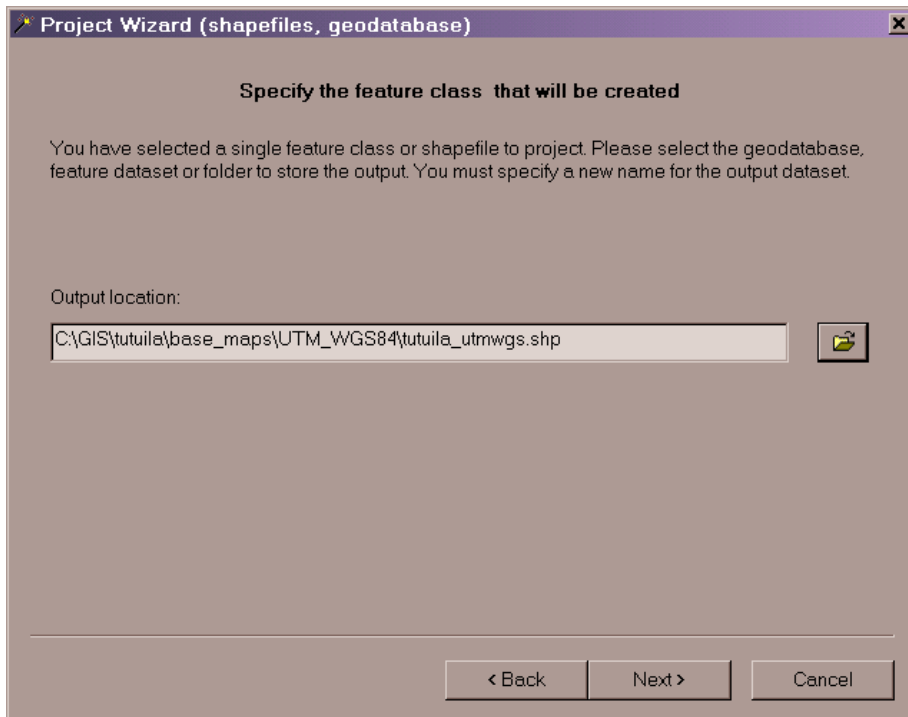
9. Open ArcGIS 8.1 ArcToolbox, click on “Projections”, and double-click on “Project Wizard (shapefiles, geodatabase)”.



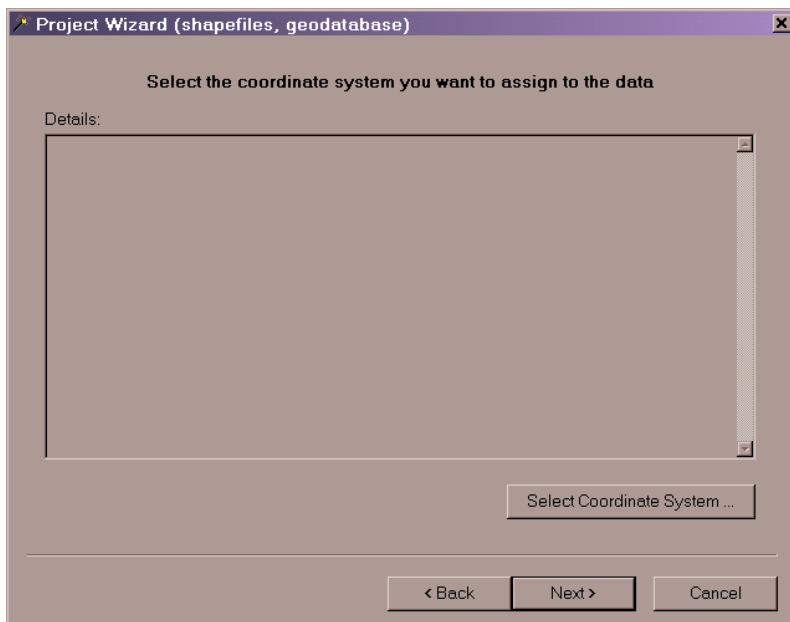
10. Click on “Browse” button  , select the shapefile whose projection was defined in the previous step and click “Next”.



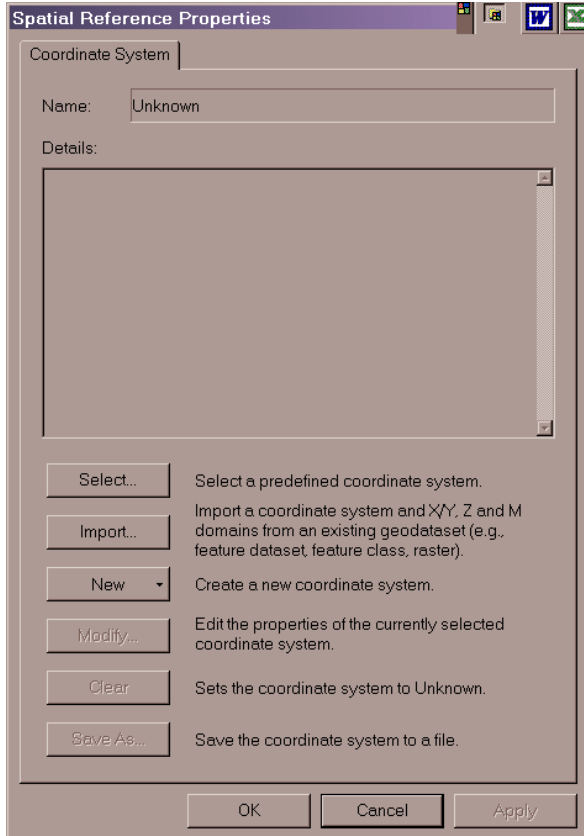
11. Click on “Browse” button , select an appropriate destination folder to store the shapefile (the new projected UTM file) and specify a name. Click “Next”.



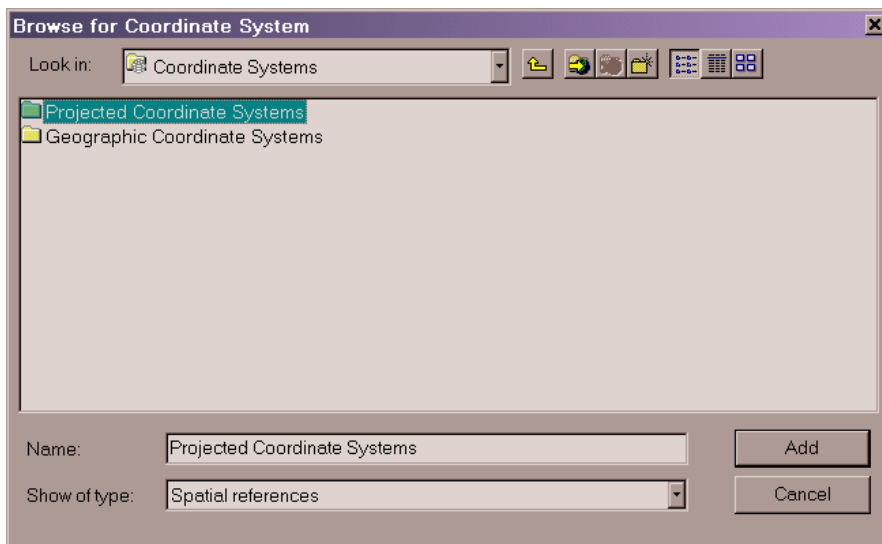
12. Click on the “Select Coordinate System” button.



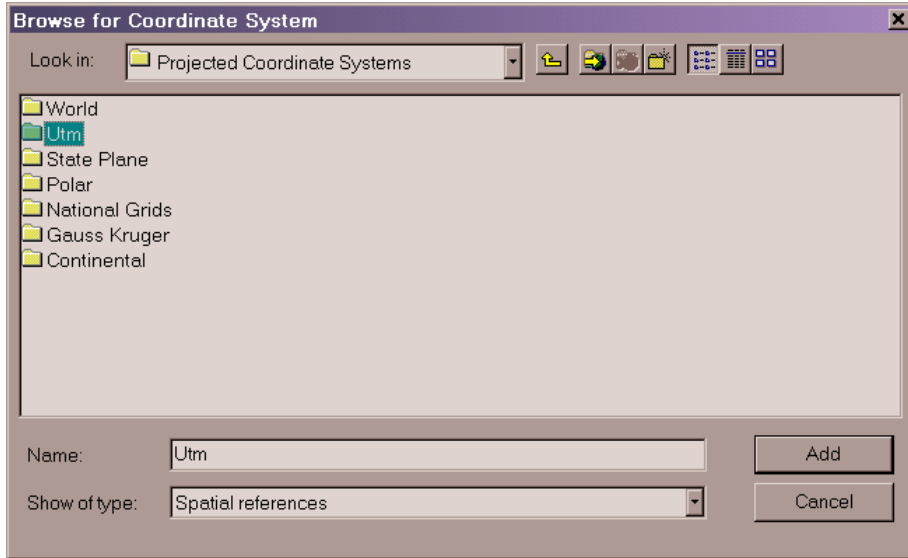
13. Click the “Select” button.



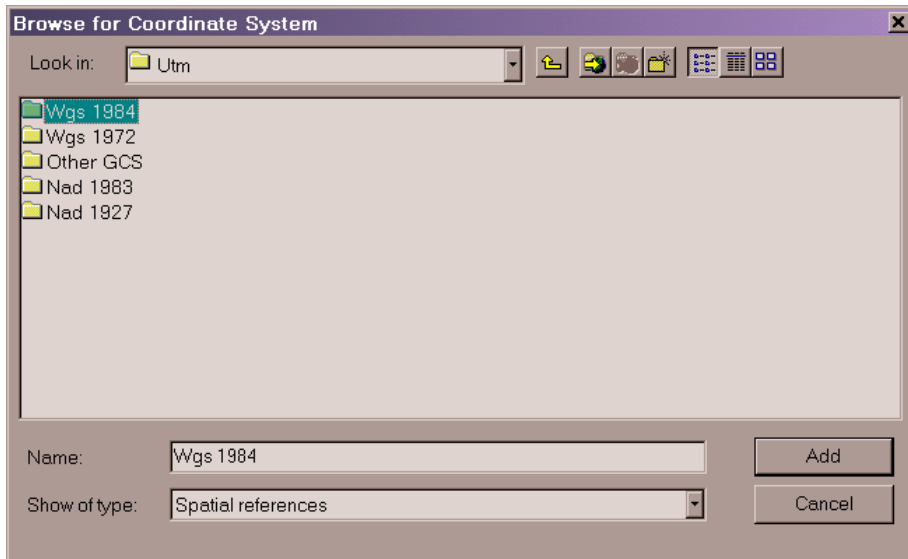
14. Select “Project Coordinate Systems” folder.



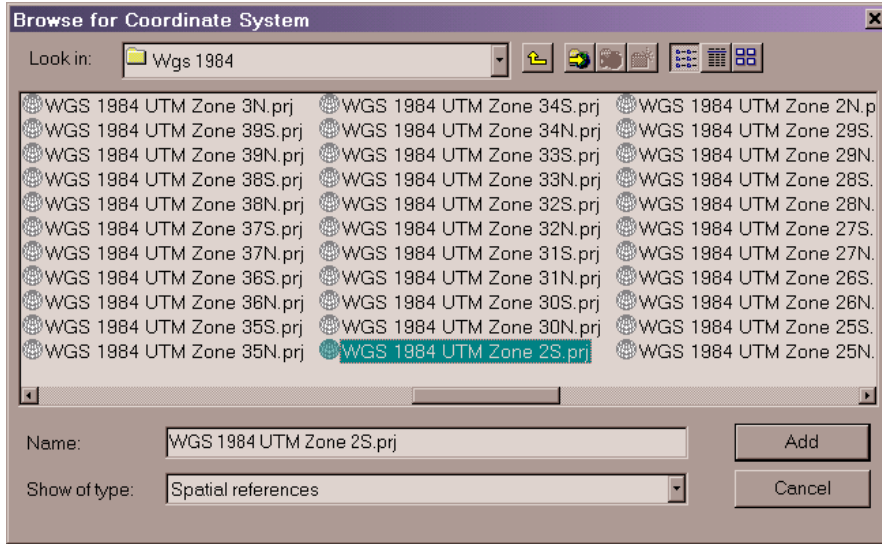
15. Select the “UTM” folder.



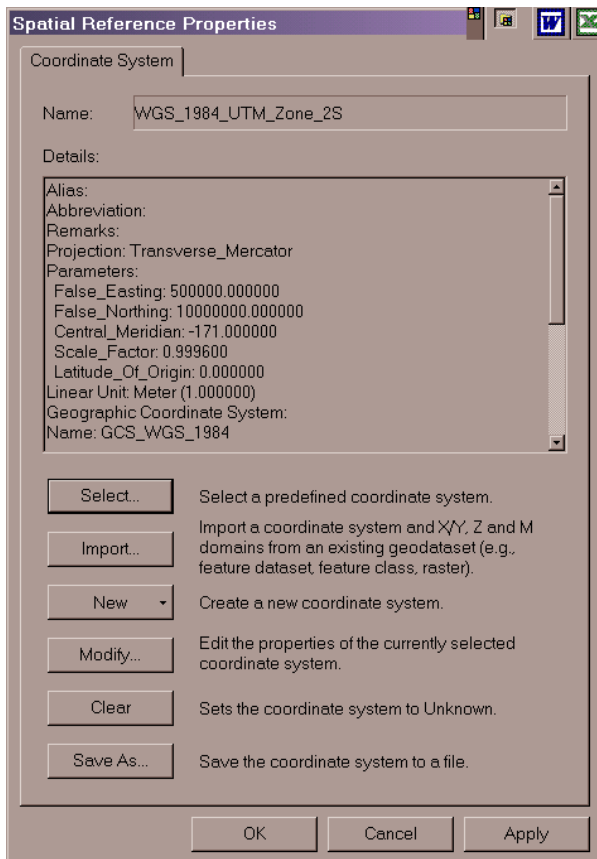
16. Select the “WGS 1984” folder.



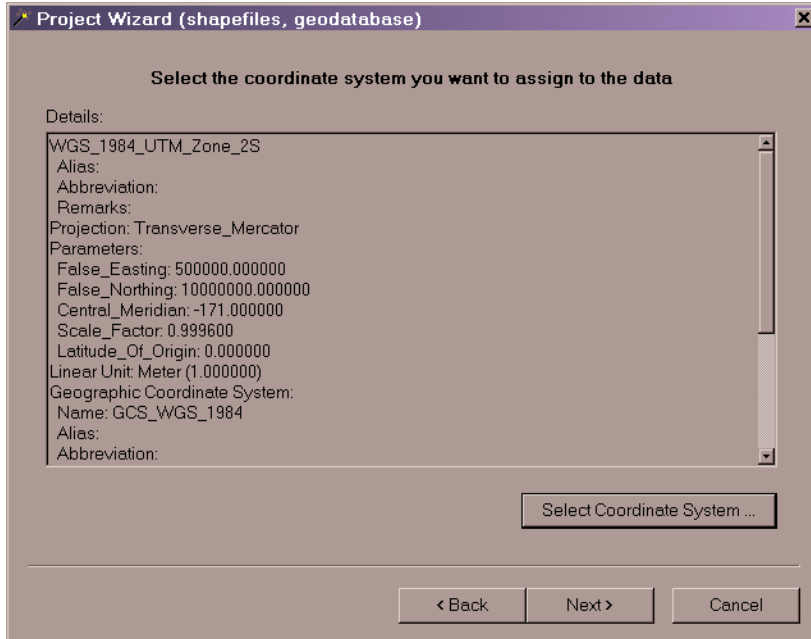
17. Select “WGS 1984 UTM Zone 2s.prj” and click “Add”.



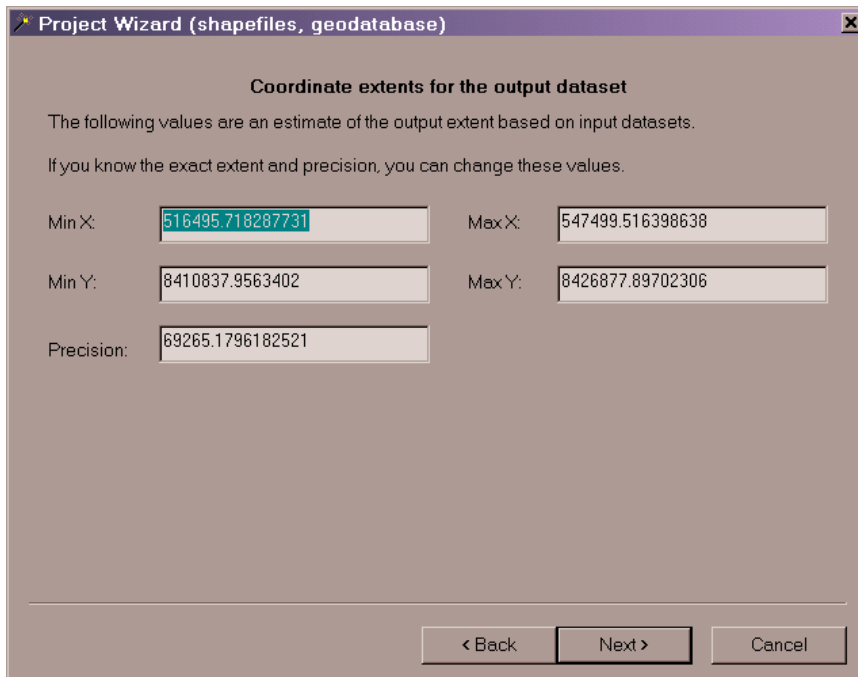
18. In the “Spatial Reference Properties” window click “Apply” and then “OK”.



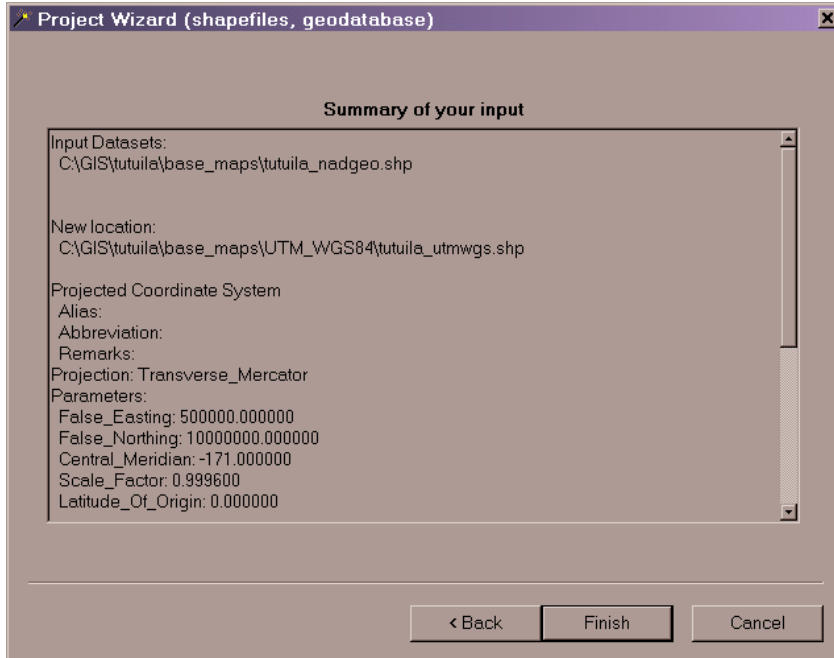
19. Click “Next”.



20. Click “Next”.



21. Click “Finish” below.



22. The shapefile projected into UTM Zone 2 South should now be stored in the previously specified directory.

