Tri-County Regional Planning Commission
Regional Zoning
GIS Project Documentation

12/13/00
Revised 11/07/2007

Projection

Michigan GeoRef:
From PDF file on Center for Geographic Information's web site:
Home page: http://www.michigan.gov/cgi
PDF: http://www.michigan.gov/documents/DNR_Map_Proj_and_MI_Georef_Info_20889_7.pdf

Projection: Oblique Mercator
Datum: NAD83
Ellipsoid: GRS80
Standard Units: Meters
Scale factor at projection's center: 0.9996
Longitude of projection's origin: 86° 00' 00" W
Latitude of projection's origin: 45° 18' 33" N
Azimuth at center of projection: 337.25556
False Easting: 2546731.496
False Northing: -4354009.816

What is the Michigan GeoRef Coordinate System?

Michigan GeoRef is an alternative to the State Plane Coordinate System. But, unlike Michigan State Plane, GeoRef was designed to project the State using a single zone rather than three zones. Of course, something had to be compromised to achieve a single zone system. The Michigan State Plane System specifies that 10,000 ft. on the ground can appear as no less than 9,999 ft. and no more than 10,001 ft. (1 part in 10,000) in the projected image or map. The Michigan GeoRef System, on the other hand, allows that same 10,000 ft. to vary from 9,996 ft. to 10,004 ft. (4 parts in 10,000) in apparent length.

Based on an Oblique Mercator projection with special parameters, the Michigan GeoRef System minimizes this increase in distortion by using a fundamentally different kind of map projection than is used by virtually all the State Plane Systems. The State Plane Systems make use of two basically different projection models. One of those projection methods favors regions that extend primarily north and south, and the other method favors regions that extend more in an east and west direction. This choice for states such as Tennessee (east-west) and Vermont (north-south) was easy and uncompromising. However, Michigan is an odd-shaped state, expansive in a direction angling from the southeast to the northwest. The Map Projection Model used in GeoRef is well-suited to accommodating skewed regions such as Michigan.
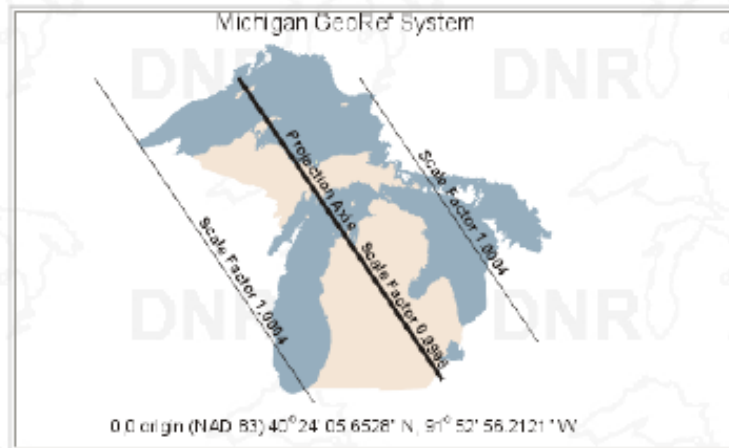
For some applications, a single-zone system is almost a necessity. Naturally, defined regions like watersheds and forest compartments do not adhere to political boundaries, as does the three-zone Michigan State Plane system. In a multi-zone system, each zone is fundamentally incompatible with any other zone. They can not be brought together in any analytically useful way.

If in a particular application the need for a single-zone system outweighs the need for 1:10000 degree of accuracy, Michigan GeoRef may serve as a more practical basis for that work.

Need to Convert Your Data to Michigan GeoRef?

For ArcView users, an extension is available that offers the capability of converting data to and from Michigan GeoRef. It can be downloaded from the "Software Tips" page.
For ArcInfo users, listed below are links to projection files that provide the information necessary to reproject your data to Michigan GeoRef.

Projection File

Geographic (Latitude/Longitude) To GeoRef	**Download**
Geographic (Latitude/Longitude) NAD83 To GeoRef	**Download**
State Plane Zone 2111, NAD27 Datum To GeoRef	**Download**
State Plane Zone 2112, NAD27 Datum To GeoRef	**Download**
State Plane Zone 2113, NAD27 Datum To GeoRef	**Download**
State Plane Zone 2111, NAD83 Datum To GeoRef	**Download**
State Plane Zone 2112, NAD83 Datum To GeoRef	**Download**
State Plane Zone 2113, NAD83 Datum To GeoRef	**Download**
Lambert Projection (Custom), NAD27 Datum To GeoRef	**Download**
UTM Zone 15, NAD27 Datum To GeoRef	**Download**
UTM Zone 16, NAD27 Datum To GeoRef	**Download**
UTM Zone 17, NAD27 Datum To GeoRef	**Download**
UTM Zone 15, NAD83 Datum To GeoRef	**Download**
UTM Zone 16, NAD83 Datum To GeoRef	**Download**
UTM Zone 17, NAD83 Datum To GeoRef	**Download**

Field Name and Description

The GIS database includes the following fields: *(Please note that the TransCAD version assigns a TransCAD ID number to each record)*

FMCD* FIPS Minor Civil Division. Federal Number Identifying a City or Township This City and Township layer is being distributed by county. Since some cities are split by a county boundary, the entire city would not be provided with a single county's shapefile (provided by The Center for Geographic Information, State of Michigan)

NAME* City, Village, or Township Name. Townships are provided with a TWP after the township name while city names are provided with no qualifiers. For example Lansing Township will be provided as Lansing Twp while the City of Lansing will be provided as Lansing. (provided by The Center for Geographic Information, State of Michigan)

LINK* Link Number. **MCDs**-The Link number is created by concatenating the Federal Information Processing System (FIPS) county code with the FMCD. The LINK numbers allow the polygons to be linked to census data. **Villages-** Concatenating the Federal Information Processing System (FIPS) county code with the Place number create the Link number. The LINK number accounts for villages that are split by a county line. The LINK numbers also allow the polygons to be linked to census data. (provided by The Center for Geographic Information, State of Michigan)

ID or FID GIS unique numerical ID given to feature (1, 2, 3......); ArcGIS uses FIDs

Shape GIS description of the feature (polygon, line, polyline, point)

Zdcode* Original district code if used by jurisdiction- as updated in 2006.

Zdname* Original zoning classification as updated in 2006.

Jurisname* Name of the jurisdiction where the zoning classification was used.

Juriscode Numeric code for jurisdiction (tax assessor's code). **not currently used**

County County of jurisdiction.

Cntycode Numeric code for county (tax assessor's code). **not currently used**

Zorddate Date of zoning map.

Zdcode2 Original district code if used by jurisdiction- used to help copy attributes from 2000 files to the updated 2006 file.

Zdname2 Original zoning classification- used to help copy attributes from 2000 files to the updated 2006 file

Zccode 4 digit general classification code

Code1 Classification group

Code2 Permitted uses group

Code3 Parcel size

Code4   Secondary/special uses code

Ncode1   Classification group name

Ncode2   Permitted uses group name

Ncode3   Parcel size

Ncode4   Secondary/special uses name

Zclname   Zoning classification name **not currently used**

Zcdate   Date file was coded

Zccolor   Color name for mapping purposes, **currently not used**.

Zchatch   Pattern name for mapping purposes, **not currently used**

Asize   Actual or lowest minimum parcel size permitted.

Acres   Acreage in square meters per polygon calculated in ArcGIS.

Perimeter   Perimeter in meters per polygon calculated in ArcGIS

AREA   Area in square meters per polygon calculated in ArcGIS - based on Michigan
                 GeoRef projection

Area_Miles   Area in square miles per polygon calculated in ArcGIS

Sources of Zoning

Original data collection for regionwide GIS layer - 12/2000
   **jurisdictions supplied updates upon request - 2006

Clinton County
Zoning and ordinances maintain on an individual basis:

Bath Charter Township**
DeWitt Charter Township**
Watertown Charter Township**
City of DeWitt**
City of St Johns**

Village of Elsie
Village of Fowler**
Village of Maple Rapids
Village of Ovid**
Village of Westphalia

*Clinton County maintains the zoning maps and ordinances for the following jurisdictions**:*

Bengal Township**
Bingham Township**
Dallas Township**
DuPlain Township**
Eagle Township**
Essex Township**
Greenbush Township**

Lebanon Township**
Olive Township**
Ovid Township**
Riley Township**
Victor Township**
Westphalia Township**

***There is no zoning map or ordinance on file for the Village of Eagle

Eaton County
Zoning and ordinances maintain on an individual basis:

Delta Charter Township**
Oneida Charter Township**
Windsor Charter Township**
City of Charlotte**
City of Eaton Rapids**
City of Grand Ledge
City of Olivet

City of Potterville**
Village of Bellevue
Village of Dimondale**
Village of Mulliken
Village of Sunfield
Village of Vermontville**

*Eaton County maintains the zoning maps and ordinances for the following jurisdictions**:*

Bellevue Township**
Benton Township**
Brookfield Township**
Carmel Township**
Chester Township**
Eaton Township**
Eaton Rapids Township**

Hamlin Township**
Kalamo Township**
Roxand Township**
Sunfield Township**
Vermontville Township**
Walton Township**

Ingham County:
Zoning and ordinances maintain on an individual basis:

Alaiedon Township**
Aurelius Township**
Bunker Hill Township
Delhi Charter Township**
Ingham Township
Lansing Charter Township**
Leslie Township
Leroy Township**
Locke Township**
Michigan State University
Meridian Charter Township**
Onondaga Township
Stockbridge Township

Vevay Township
Wheatfield Township
White Oak Township
Williamstown Township**
City of East Lansing**
City of Lansing**
City of Leslie**
City of Mason**
City of Williamston**
Village of Dansville
Village of Stockbridge**
Village Webberville**

Methodology

December, 2000

Step 1   A letter and survey (see attachment A & B) were sent to each jurisdiction asking for information on any zoning & comprehensive plans for their jurisdictions. If the jurisdiction had zoning or comprehensive plan they were asked to submit a copy to our office.

Step 2   Each zoning & future land use map was digitized **INDIVIDUALLY**.

Step 3   To enable the comparison of jurisdictions a modified version of a coding system developed in Traverse city was used (see attachment C). It was encoded onto the database of each file.

Step 4   Maps of the zoning & future land use were sent to each jurisdiction for comments and review.

Step 5   Individual jurisdictions sent back corrections on boundaries. These corrections were made to the files.

Step 6   The ArcView files were converted into TransCAD for the final product.

August, 2006

1. A letter and survey were sent to each jurisdiction asking for information on any zoning & comprehensive plans for their jurisdictions. If the jurisdiction had zoning or comprehensive plan they were asked to submit a copy to our office.
2. Each zoning map was "carved" out of **ONE** GIS layer, the MCD & Village GIS boundary files from the Center of Geographic Information (CGI), to ensure the jurisdiction boundaries meet each other. There were boundary and merge issues with the 2000 zoning GIS files; which caused overlaps and gaps between jurisdictions.