

# Geographic Coordinate Systems in MicroStation

Design Manual  
Chapter 21  
Automation Tool  
Instructions

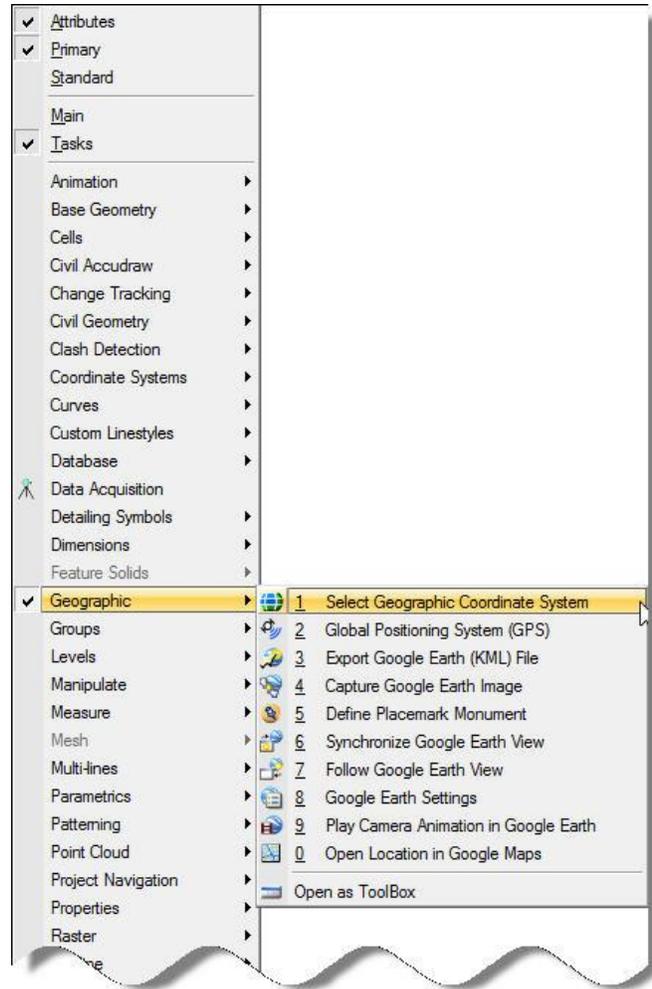
Originally Issued: 07-31-15  
Revised: 06-25-19

Setting a geographic coordinate system in MicroStation will assign the X,Y,Z coordinates into the MicroStation file to correspond with X, Y, Z coordinates of the selected coordinate system. This becomes very important when trying to reference CADD files in different coordinate system to each other, or when running a process in which MicroStation needs to know where the line work exists in the real world (creating a KMZ file for example).

The Geographic Coordinate Systems tool is accessed in MicroStation through **Tools>Geographic>Select Geographic Coordinate System**, or by clicking on the

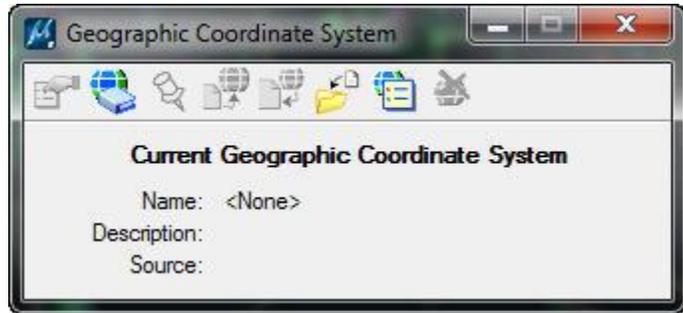


icon in the Geographic ToolBox.



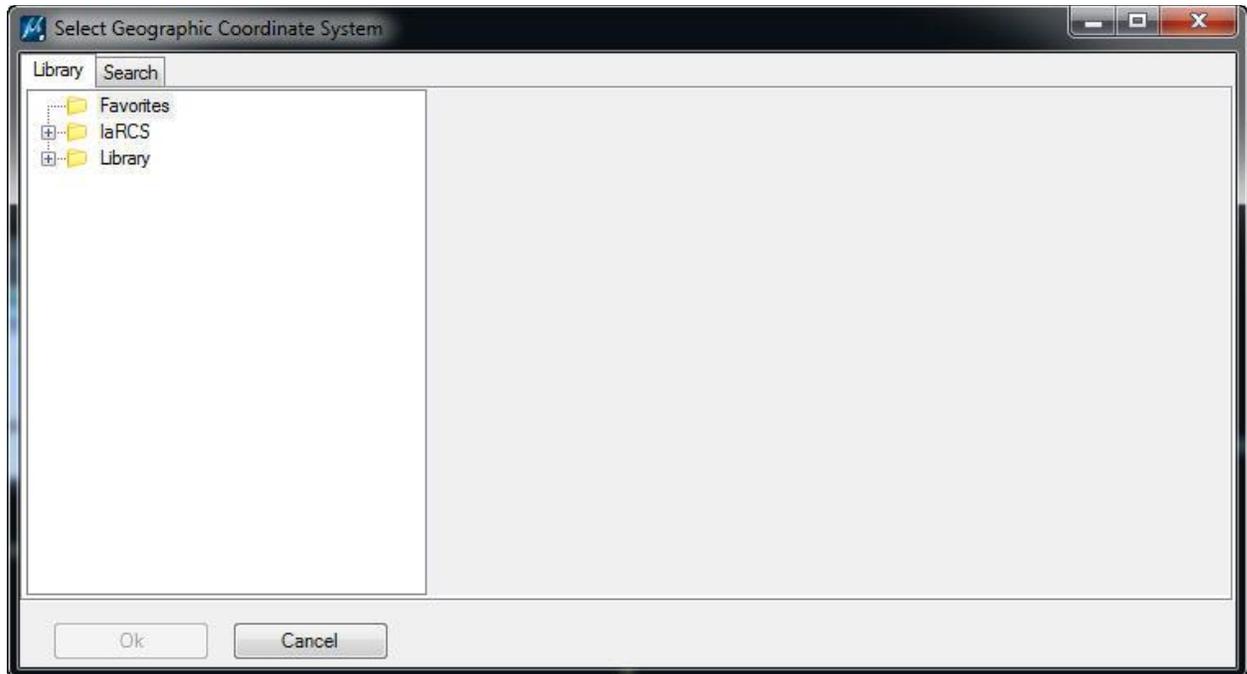
## Setting the Coordinate System

The Geographic Coordinate System toolbox shown to the right will display. The image on the right indicates that no current geographic system is applied to the MicroStation model. Geographic coordinate systems are applied to each model individually. If the appropriate geographic coordinate system is applied to the **Project Overview** model of the “DSN” seed file, the **Create New Model** ([21A-40](#)) copies the Project Overview model when creating new models and propagates the correct coordinate system to all models created using the tool.



### Selecting the Coordinate System from the Library

To set a coordinate system, *Click* on the **From Library** icon  to open the library of available coordinate systems. MicroStation comes with a large library of coordinate systems, and the Iowa DOT has also included the 14 [Iowa Regional Coordinate System](#) (IaRCS) zones within the MicroStation workspace to be available. The library should look like the image below when first opened.



Three folders are available: Favorites, IaRCS, Library.

- **Favorites:** Location to bookmark commonly used coordinate systems for ease in finding again at a later time.
- **IaRCS:** Custom Iowa DOT projections.
- **Library:** The default library of coordinate systems delivered from Bentley Systems with MicroStation.

To apply a coordinate system to the model, select the appropriate coordinate system from one of the three folders in the left side of the dialogue and *click* **OK**.

### Iowa Regional Coordinate System

The Iowa Regional Coordinate system is relatively new. Newer surveyed projects may be in these coordinate systems. This will be indicated in Project Scheduling System (PSS) in the **laRCS** column in the grid, as shown below.

Work Type  
Proj. Dir. No: 0102502014  
Consultant

Segment	laRCS	Project Number	Status	Assigned To
Right Of Way		PN-025-3(32)--2J-01	Active	Nicole L. Cuva
Bridge 0000	7 - Carroll-A	BRFN-025-3(30)--39-01	New	Bridges and Structures

The coordinate system is set in PSS per project number. When Preliminary Survey finishes the D01 event, the laRCS field will be filled out if the survey work was done in an Iowa RCS zone. This is only filled out for the project number used for the D01 event, not all project numbers associated with the PIN. This will give an indication to the designer what coordinate system the survey work was done in. If an laRCS zone was used on the survey work, the appropriate zone should be selected in the Design MicroStation file. For this example, Zone 7 (Carroll-Atlantic) was selected as the coordinate system. Using an laRCS zone will have the greatest accuracy of the linework within MicroStation to Google Earth extraction.

- +
- Favorites
- +
- laRCS
  - laRCS Zone 1 - Spencer (LCC)
  - laRCS Zone 10 - Cedar Rapids (LCC)
  - laRCS Zone 11 - Dubuque-Davenport (TM)
  - laRCS Zone 12 - Red Oak-Ottumwa (LCC)
  - laRCS Zone 13 - Fairfield (TM)
  - laRCS Zone 14 - Burlington (TM)
  - laRCS Zone 2 - Mason City (LCC)
  - laRCS Zone 3 - Elkader (TM)
  - laRCS Zone 4 - Sioux City-Iowa Falls (LCC)
  - laRCS Zone 5 - Waterloo (LCC)
  - laRCS Zone 6 - Council Bluffs (TM)
  - laRCS Zone 7 - Carroll-Atlantic (TM)
  - laRCS Zone 8 - Ames-Des Moines (TM)
  - laRCS Zone 9 - Newton (TM)
- +
- Library

## Library

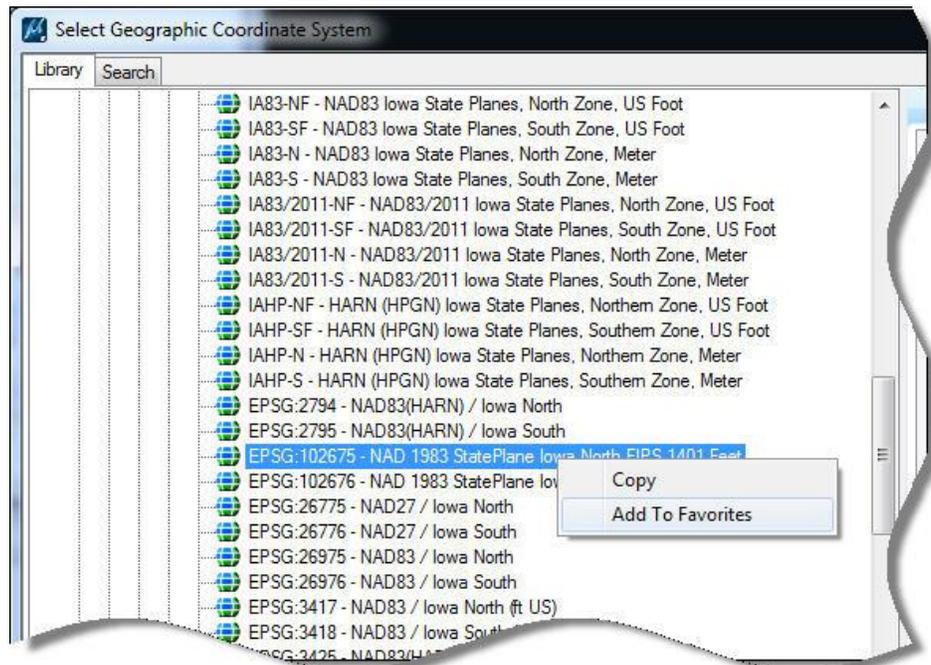
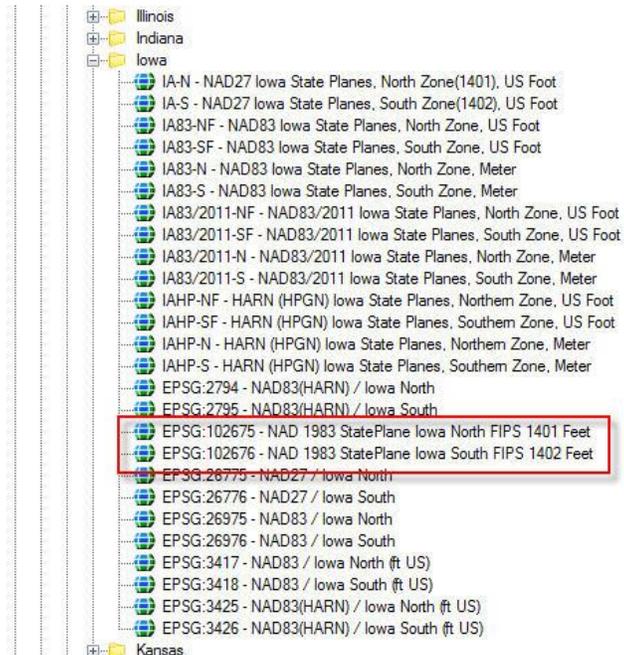
The library contains many coordinate systems; however, most CAD work is drawn in a scaled State Plane coordinate system to correct for ground truth. Older survey work should use Iowa State Plane North or Iowa State Plane South coordinate systems when an Iowa RCS zone is not appropriate. The two coordinate systems for SP North & SP South that are in the preloaded library are:

- EPSG: 102675 – NAD 1983 StatePlane Iowa North FIPS 1401 Feet
- EPSG: 102676 – NAD 1983 StatePlane Iowa South FIPS 1402 Feet

These can be selected from the library by navigating to:

**Library>Projected (northing, easting, \_)>North America>Iowa.**

These two coordinate systems may be used often and are deep in the tree of the library, making them good candidates to save to favorites. This is easily done by *Right-clicking* on the coordinate zone you want to save to favorites and selecting **Add to Favorites**, as shown below.



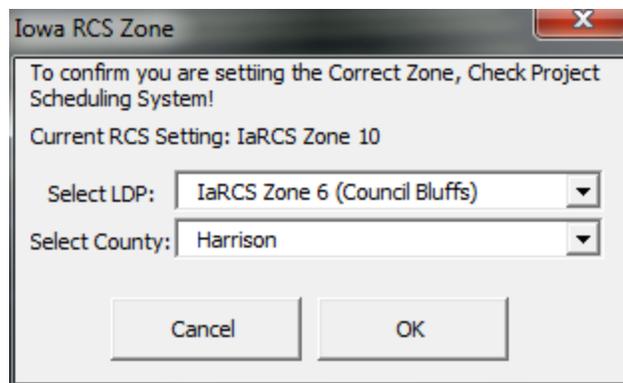
After setting the appropriate zone, the Geographic Coordinate System dialogue shown to the right will show the current coordinate system attached to the MicroStation model. This example has IaRCS Zone 7 applied to the model.



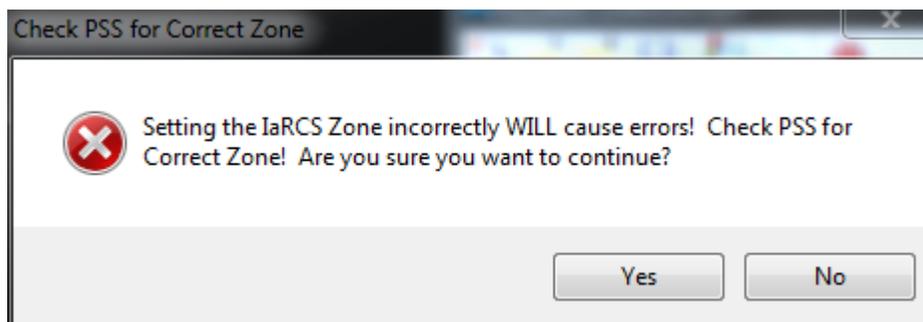
## Automated Application of Geographic Coordinates

Newer projects that have been surveyed in Iowa RCS, have had the correct zone set in PSS, have had the project properties set correctly in ProjectWise, and have had the appropriate workspace applied to the ProjectWise folder will, when opening the MicroStation DGN file for the first time, run an automated tool to set the geographic coordinate system upon.

The image on the right will appear if the MicroStation DGN you are working in does not have a geographic coordinate system set, and the appropriate workspace has been applied to your working directory. This will be done to projects that have been surveyed in IaRCS as they come up until the completed system is in place to set all new projects in PSS with a coordinate system upon project number creation.



The tool will read the county and select the appropriate zone based on the county. *Click OK* to set the geographic coordinate system to the project overview model. The message below will appear asking if you're sure you have the correct zone being applied. *Click Yes* to set the zone and continue into the drawing.



# Chronology of Changes to Design Manual Section:

## 021C-071 Geographic Coordinate Systems in MicroStation

6/25/2019 Revised  
Updated hyperlinks.  
Updated header logo and text.

7/31/2015 NEW  
New