Preparing Data and Maps for Display in Google Earth

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Alignment Issues

Google Earth (also Google Maps and Microsoft Virtual Earth) use a Mercator projection based on a spherical datum (in ESRI parlance, datum = "Geographic Coordinate System; GCS") that is a modification of the WGS84 datum. The "true" WGS84 datum is ellipsoidal (GRS80 ellipsoid) and geocentric; only the geocentric aspect is common to both. For data or maps that use the true WGS84 datum good alignment can be achieved by projecting to the "**WGS 1984 Web Mercator**" coordinate system, which uses the "WGS 1984 Major Auxiliary Sphere" datum (GCS). Use the *Project* or *Project Raster* tool in ArcToolbox; the **WGS 1984 Web Mercator** projection can be found under Predefined>Projected Coordinate Systems>World.

For data or maps that use a different datum, for example NAD27, the above approach will not yield good alignments –datum transformations are required first. The exception is NAD83 data, which can be treated like WGS84 (both use GRS80 and are geocentric).

1) Transform the data to WGS84. For example, if the data use NAD27 apply the "NAD_1927_To_WGS_1984_79_CONUS" transformation.

2) Next, transform the data using the "WGS_1984_Major_Auxiliary_Sphere_To_WGS_1984".

The transformation names can be cut-and-pasted into the Transformation field of the *Project* or *Project Raster* tool.

This technique has been tested and works well for data and maps that use NAD27; it has not been tested for other datums. As a last resort (for small areas), data may be shifted manually using "Spatial Adjustment" tools in ArcGIS (See ArcGIS Help files for directions) or, with lesser fidelity, by adjusting them directly within Google Earth.

Symbology

Dashed and dotted lines will default to solid lines; fill patterns are not preserved. Relative line widths are retained if they are integers. Certain geologic symbols are preserved, others are not or are grossly distorted. Strike and dip data can be properly displayed but require <u>special preparation</u>. If an exact version of an ArcMap document is required then use the "Return single composite image" parameter of the *Layer To KML* or *Map To KML* tools to convert the symbolized features into a raster image.

Labels and Attribute Display

Google Earth displays feature attribute information via pop-ups that are visible by clicking on the feature. Certain information (e.g. layer name, feature name) is also visible in the Table of Contents and labels. If feature labels are turned on, the layer's label field or expression will be used for feature names. If labels are not turned on, the layer's display field or expression will be used for the feature names. If neither of these layer properties are set, values from a field named "Name" will be used for the feature swill be labelled. For line or polygon features, a point file of centroids can be created (ArcToolbox has a tool...) and labelled.

By default, the Google Earth pop-up display will show all visible attribute fields for the layer. When an attribute table is visible in ArcMap, right-click on a field name to find the "Turn Field Off" option for fields you don't want visible, use field name aliases to clarify attributes (under field "Properties..."), and controlling what will be displayed using layer HTML pop-up properties (see Desktop Help). If the layer's HTML pop-up displays are turned off, the values in the feature layer's "PopupInfo" field will be shown in the pop-up display when a KML feature is clicked. These can be numeric or text values or HTML-formatted code stored in a text field.

For geologic maps that contains many lines and polygons, consider "Merging" all polygon or line records that share common attributes. "Merge" is available while editing – see Desktop Help for directions. The "Explode" editing tool can be used to later undo any merges if needed. Merging creates fewer records and a cleaner display in the Google Earth Table of Contents.