

## Export to KML Extension Version 2.4 documentation

---

### description

---

*Export to KML* is an extension developed for ArcGIS 9.x by the City of Portland, Bureau of Planning. The extension allows ArcGIS users to export any point, line, or polygon dataset in "keyhole markup language" [KML] format for viewing in the free Google Earth data viewer.

For more information on KML, please refer to the Google Code KML documentation:  
<http://code.google.com/apis/kml/documentation/>

One note: This is a free product and is not intended to replace the commercial KML tools available for ArcGIS. While I will continue to maintain and improve the extension's functionality, there are limits to what I am able to do without a substantial investment of time and resources. If you need more sophistication than this tool offers, I encourage you to check out one of the commercial products.

One other note: I want to acknowledge all of the users who have reported errors and sent suggestions on how to improve the extension. You've made this a much more useful tool... thanks.

### install/uninstall

---

**You must have local administrative rights on your computer to install the *Export to KML* ArcMap extension. Also note that the directory where the installation files are stored cannot have any spaces in the pathname (or the installation will fail). Finally, the Windows Vista operating system is not supported (and will not be for some time).**

Make sure you have the latest version of Google Earth installed (Google Earth can be downloaded from <http://earth.google.com/>).

Open the 'Export\_to\_KML\_{version number}.zip' archive and specify a location for the files to be extracted. *Note that an 'Export\_to\_KML' folder will be created in the specified location.* If you are upgrading from an earlier version of 'Export to KML', extract the files from the downloaded zip file containing the new version into the same directory as the old version (and allow the old directory and files to be overwritten).

Double-click the batch file 'ExporttoKML\_INSTALL.bat' to register exporttokml.dll and to add the appropriate registry keys. Open ArcMap, then browse to *Tools – Extensions* and click on the

## Export to KML Extension Version 2.4 documentation

---

checkbox next to the "Export to KML" extension. Then browse to *View – Toolbars* and click the "Export to KML" toolbar to make it visible.

If the "Export to KML" toolbar is not listed in ArcMap after running the installation batch file, you will need to also register the extension directly from ArcMap. In ArcMap, select *Tools – Customize*, then press the *Add from File* button. Browse to the 'ExporttoKML.dll' file that was extracted from the downloaded zip archive and select *Open*. The "Export to KML" toolbar will then be added to the list of toolbars. Browse to *View – Toolbars* and click the "Export to KML" toolbar to make it visible.

To remove the extension, double-click the batch file 'ExporttoKML\_UNINSTALL.bat'. If you want to be absolutely sure the extension was completely uninstalled, check to make sure all component categories were removed using "Categories.exe" in C:\Program Files\ArcGIS\Bin. Just manually remove any of the following entries that remain:

- > prjExporttoKML.clsCustomGXFilter from 'ESRI GX Object Filters'
- > prjExporttoKML.clsExporttoKML from 'ESRI Mx Commands'
- > prjExporttoKML.clsExporttoKMLExtension from 'ESRI Mx Extensions'
- > prjExporttoKML.clsExportToKMLToolbar from 'ESRI Mx CommandBars'

### what's new in version 2.4

---

- > implements KML version 2.2
- > selected attributes from the GIS database can now be added to and stored in the output KML using KML's "schema" tags
- > labels and information points can now be vertically offset from exported features
- > layer and features descriptions can now be saved as and imported from files
- > feature "names" are now independent of the feature labels
- > a horizontal "shift" (in X/Y coordinates) can now be applied to exported data
- > supports KML "time stamps" (for time animations); formats date/time formats to Google Earth XML standard
- > labels & information points can now be forced to fall inside polygons

### what was new in version 2.3

---

## Export to KML Extension Version 2.4 documentation

---

- › graduated marker symbols are now supported
- › multi-part features are now supported; multi-part features are labeled individually
- › the feature name can now be explicitly defined as one of the layer attributes (in "Labeling and description options"); features in the output KML are sorted on this attribute
- › there is now an option to include point labels as either part of the feature or as a separate label layer
- › fixed issue with commas in European operating systems
- › bunch of other bug fixes, minor tweaks and improvements

### what was new in version 2.2

---

- › labels are now independent of symbology and grouping; point, line, and polygon labels can be turned on and off via a single "Feature Labels" layer
- › "information points" can be added for line and polygon features; these points can be selected in Google Earth to display information contained in the feature description; points can be turned on and off via a single "Information Points" layer

### main form controls

---

#### select layer to export

Select the point, polyline, or polygon dataset containing the features you want to export to KML format. The layer can be in any ArcGIS format – shapefile, coverage, or GDB. The layer must have a defined spatial reference (it will be reprojected into WGS 84 geographic coordinates if necessary). By default, only the selected features will be exported (see *options form controls*).

#### group and color features using the layer's symbology

If checked, the ArcMap layer symbology is used by the output KML. Symbology can be "single symbol", "unique values", "graduated colors" or "graduated symbols" (*multiple unique value fields and class normalization are not currently supported, and the symbol field cannot be in a "joined" table.*) If using a unique value or graduated symbology, the output KML will be "grouped" by the symbol attribute. Each symbol category will have its own folder, name, and symbology. For example, a building polygon dataset could be grouped on

## Export to KML Extension Version 2.4 documentation

---

an attribute identifying the building use (residential, commercial, etc.). Note that because Google Earth does not currently support hatching and other complex symbology, only the colors and line widths of symbols are used by the output KML.

### **select an attribute for labeling features (*optional*)**

An attribute in the GIS layer that will be used to create feature labels in the output KML. If features are being labeled, this is also the field that will be used to name the individual the features in Google Earth.

### **select an attribute that represents the height (*optional*)**

Specifies an attribute to use for setting each feature's vertical height. The height of true 3D features, such as 3D shapefiles, can be set using their z-value. Height attributes must be numeric.

### **height attribute units (*optional – only enabled if an height attribute is selected*)**

The linear units of the height attributes, either feet or meters. This ensures that the height or elevation values are in the correct format for Google Earth, which uses meters.

### **extrude features based on the height (*optional – only enabled if an height attribute is selected*)**

Extrudes features based on their height. All feature types can be extruded in Google Earth – points, polylines, and polygons. By default, features are extruded using the KML altitude mode "relative to ground", meaning the extrusion value is added to the feature's surface elevation if terrain is being used, or added to 0 if no terrain is being used (the altitude mode can be changed on the "options" form). For example, a building polygon dataset could be extruded using a field that contains the height the building. The output KML will extrude each building from the ground to its specified height, making them appear 3-dimensional when the view is tilted.

### **name and location of the output KML**

Shows the file name and directory location of the KML file that will be created by the export. The user must browse to the desired directory using the "browse" button, and specify a file

## Export to KML Extension Version 2.4 documentation

---

name (the .kml extension will be added automatically). Existing KML files can be overwritten.

### options form controls

---

#### export options

*export only the selected features*

If checked, only the selected features are exported. If no features are selected, all features are exported. Checked by default.

*output KML layer name*

The name of the layer that will be displayed when the KML is opened in Google Earth. Same as output file name by default.

*KML layer transparency*

The percent transparency of the output KML layer. 0% by default.

*KML layer description*

The description of the layer that will be displayed when the KML is opened in Google Earth. The user will see the full description when they click on the name of the KML layer. The layer description can include HTML markup and hyperlinks. Each of these items is described briefly below:

- › using HTML tags – some common HTML tags are provided. The buttons above the description box will add tags for bold, italic and underlined text (text should be inserted between the two tags). Other tags can be added manually.
- › adding hyperlinks – hyperlinks can be added to the description without tags; any valid URL string is automatically converted to a hyperlink to that URL (e.g. <http://www.google.com>).

## Export to KML Extension Version 2.4 documentation

---

"Save" will save the current layer description out to a "KML layer description" (.kld) file. The description can be imported from the KLD file using the "Import" button.

### *apply horizontal shift to features*

Allows user to manually shift the output features in the exported KML file by X units along the x-axis and Y units along the y-axis. Units are determined by the exported layer's projection. A shift may be necessary in certain areas if, for example, the Google Earth imagery is not accurately registered.

## **labeling and feature description options**

### *apply feature colors to labels*

If checked, the feature labels will be the same color as the feature they label. If unchecked, all labels will be white.

### *label features with empty or <null> values*

If checked, features with empty or "Null" label attribute values will be labeled as "-NULL-". If unchecked, these features will not be labeled. The default is unchecked.

### *export labels as a separate KML layer (optional for point features only)*

If checked, point feature labels will be exported as a separate KML layer (or "folder"), meaning the labels are independent of the features and can be turned on and off. The default is checked.

### *select an attribute for naming the features*

An attribute in the GIS layer that will be used to name the features in the output KML. By default, the same attribute used to symbolize the layer in ArcMap will be used to create the feature names (or the label attribute if no categorical symbology is being applied to the output KML). The KML features will be sorted on the feature name attribute in ascending order. This is also the text that will be displayed in bold at the top of the feature description.

## Export to KML Extension Version 2.4 documentation

---

### *force labels and information points to fall inside polygons*

If checked, polygon labels and "information points" will be forced to fall within the boundary of polygon features (instead of the weighted center, which may be outside the polygon). Note that checking this option may slow processing time considerably.

### *feature description*

The feature description option allows users to build a "description expression" that will be used to describe each of the output KML features. The description appears in Google Earth when either a) a feature name is clicked in the "Places" pane, b) the feature's "information point" is clicked (assuming they were created), or c) the feature is clicked while holding down the CTRL key.

The feature descriptions can include attribute values, HTML markup, and hyperlinks. Each of these items is described briefly below:

- › attribute values in the description – double-click the attribute name in the "layer attributes" box to add an attribute value to the description. The "Add ALL Attributes" button will add all of the feature attributes to the description. *Attribute names must be surrounded by brackets.*
- › using HTML tags – some common HTML tags are provided. The buttons above the description box will add tags for bold, italic and underlined text (text should be inserted between the two tags). Other tags can be added manually.
- › adding hyperlinks – hyperlinks can be added to the description without tags; any valid URL string is automatically converted to a hyperlink to that URL (e.g. <http://www.google.com>).

"Save" will save the current feature description out to a "KML feature description" (.kfd) file. The description can be imported from the KFD file using the "Import" button.

### *Create an "information point" for each feature*

Creates points in the output KML that sit on top of each feature. These points can be selected ("clicked") in Google Earth to display the feature description. The points make it easier, especially in complex 3D datasets, to select and display the feature description.

### 3D options

#### *altitude mode*

Determines the KML altitude mode if specifying feature heights:

- › "*Relative to ground*" sets the altitude of the element feature to the actual ground elevation of particular location. If, for example, a feature with a height of 9 meters is set over a location where the ground elevation is 10 meters above sea level, the elevation of the feature is 19 meters. Only available if a height is being assigned to features.
- › "*Absolute*" sets the altitude of the element exactly above sea level, regardless of the actual elevation of the terrain beneath the feature. For example, if the height of a feature is 10 meters, and the terrain below is 5 meters above sea level, the feature will appear elevated above the terrain by 5 meters. Only available if a height is being assigned to features.
- › "*Clamped to ground*" drapes all elements on the Google Earth surface (either a flat plane or the surface if terrain is being displayed). This is the default altitude mode if features are not being assigned a height.

#### *surface offset attribute*

If heights are being assigned to features, a surface offset can be specified. Note that the offset will still be extruded if the extrusion option is selected.

#### *surface offset constant value for features*

If heights are being assigned to features, a surface constant surface offset can be specified. The surface offset will be added to the values of the surface offset attribute if one has been specified. Note that the offset will still be extruded if the extrusion option is selected.

#### *surface offset constant value for labels*

If features are being labeled, a constant surface offset for the labels can be specified.



## Export to KML Extension Version 2.4 documentation

---

*surface offset constant value for features*

If "information points" are being created, a constant surface offset for the points can be specified. There will be a "leader" line from the information point to the surface.

### **time options**

*select an attribute that represents the "start time" of each feature*

You can specify an attribute to use for setting the start – or "begin" – time of each feature. Adding start and/or end times will enable the "time slider" in Google Earth, allowing you to do time series animations.

*select an attribute that represents the "end time" of each feature*

You can specify an attribute to use for setting the end time of each feature. Adding start and/or end times will enable the "time slider" in Google Earth, allowing you to do time series animations.

*format all dates and times to the Google Earth XML standard*

Converts all date and time attributes to the XML standard time (YYYY-MM-DD HH:MM:SS) format required by Google Earth. For more information on Google Earth time/date formats, refer to the online KML documentation. This option is enabled by default and should only be disabled if you have a specific reason to override the formatting.

### **database options**

*export GIS database "schema" to google earth kml file*

You can include the GIS database "schema" – or attribute item definitions and values – in the output Google Earth KML file. This is important if you want to retain the GIS attributes in a more structured format than the KML feature description. It is also important if you want users to be able to import the KML back into GIS. *If no "feature*

## Export to KML Extension Version 2.4 documentation

---

*description" is specified in the "Labeling and Description Options", the schema attributes will be used as the feature description.*

### about "export to kml"

*check for updates*

Opens the ArcScripts homepage for "Export to KML". The latest version of the script can be downloaded and installed from here. I recommend that users check the website regularly (once every month or so, more often when a new version is first released).

### known issues

---

- › There is an upper limit of features that you can export. All the information about the features you are exporting is temporarily stored in memory, rather than writing it out to a temporary file on the hard drive, so the number of features you are able to export is limited by the amount of RAM available.
- › joined table attributes are not currently available to the extension; this issue will be addressed in a future version. To access joined table fields, you will need to export the data to a shapefile before exporting.
- › there are some issues with converting GIS data that is in certain projections that causes the resulting KML to display incorrectly in Google Earth. This is a glitch with ArcObjects "on-the-fly" reprojection functionality. If you are having issues, reproject your data manually (in ArcToolbox) to the Google Earth coordinate system before exporting. Google Earth uses latitude/longitude coordinates based on the WGS84 datum (in ArcGIS, this is known as "geographic coordinate system", or GCS).
- › an error occurs with some types of SDE data. If you run into this error, export the SDE data to a shapefile before exporting.
- › "GIS server" layers are not currently supported. If server layers are in your mxd, the "Export to KML" extension will work, though very slowly.
- › "multipoint" features are not currently supported.

## Export to KML Extension Version 2.4 documentation

---

- › proportional symbols are not currently supported.

### bug fixes

---

#### version 2.4

date	summary	description
2/6/08	Modified function to handle special characters in KML "styles"	Exported KML would not open if non-alphanumeric characters were used in the layer symbology (e.g., ">", "&")
1/4/08	Fixed issue with info points and multi-part geometries	With multi-part geometries, the info points were being assigned to the wrong features in some cases
11/20/07	Fixed minor issue with class breaks value inconsistency	There was a slight inconsistency between class break values converted from strings and their numeric counterparts; it's fixed

#### version 2.3

date	summary	description
5/10/07	Circles and curves not exporting from geodatabases	"Densified" true circles and Bezier curves into individual segments for export to KML
3/27/07	Output KMLs not displaying correctly in Google Maps API	Removed unnecessary leading commas before line and polygon coordinates
9/7/06	<i>Major</i> error introduced at version 2.3.2 was corrected – extruded height values were bogus	Apologies to everyone who had to deal with the confusion this one caused; fixed error in code to correctly extrude features
8/14/06	"information points" all describe the last feature exported	Fixed error in code to correctly export individual feature descriptions

## Export to KML Extension Version 2.4 documentation

---

8/8/06	export failure with topologically-incorrect polygons	Modified code to clean polygon topology on export using IPolygon4.SimplifyEx
8/8/06	European operating systems 3D issue	modified code to correctly extrude 3D features on European (comma-based) operating systems

## disclaimers

---

This extension is offered freely to the community, but is provided "as is". Any express or implied warranties, including the implied warranties of merchantability and fitness for a particular purpose are disclaimed. In no event shall myself or the City of Portland or contributors be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) sustained by you or a third party, however caused and on any theory of liability, whether in contract, strict liability, or tort arising in any way out of the use of this extension, even if advised of the possibility of such damage.

## contact

---

Please feel free to contact me to report bugs or bug fixes, request additional functionality, suggest improvements, or with any other questions. The download includes all of the original VB source code. Please keep me in the loop on any improvements or fixes you make. Enjoy!

kevin martin | gis analyst | city of portland | bureau of planning  
[kmartin@ci.portland.or.us](mailto:kmartin@ci.portland.or.us)