Accurate Map in Google Earth Using KML

Ghusoon Idan Arb - Assist Lecturer, Computer Engineering Dept., Mustansiriyah University,
Email - eng.computer38@gmail.com

Abstract:
Convert a Map Document into a Keyhole Markup Language (KML) file containing a translation of ESRI geometries and symbology. This file is compressed using zip compression and will have a ".kmz" extension and can be read by any KML client including ArcGIS Explorer, ArcGlobe, and Google Earth. KML files are a snapshot of the current state of the GIS data, and can contain both vector and raster elements. Vector elements, in particular, are effectively shared in KML files as their geometry and symbology can be fully contained in a small file. Imagery data shared in KML files, on the other hand, must be brought across the network for displaying and are therefore usually defined at a limited resolution to reduce the file size.

Key Words: Keyhole Markup Language , Google Earth, GIS.

Introduction:

Google Earth is a program that allows users to find places on the Earth, mark them, and show visual data. Google Earth is a program that is becoming compatible with many other programs [1]. Google Earth is considered as the rapid source for information. In fact, it includes the entire database for each country over the entire world. On other words, Google Earth is a database viewer that combines satellite data to reconstruct a three-dimensional model (3D) of the ocean and Earth's surface [2]. It is possible to use Google Earth without an internet connection, but functionality is limited to low resolution satellite imagery, imagery cached on the computer from recent use, and locally saved KM files [3].

Materials:

When Google Earth is opened, it will immediately have the globe in hands for navigation. First, let's understand the Google Earth Layout, see Figure (1):

Figure (1): The Google Earth Layout [30]

1) Search bar

The Search box allows users to Fly To or move the view to any place in the Google Earth database. You can also Find Businesses, and locate Directions.

2) Places

In the Places window, one can mark and save placemarks, polygons, paths, and pictures that one would like to highlight. Any items located beneath My Places will automatically open once Google Earth is restarted. Any items located beneath Temporary Places will be removed when Google Earth is closed. It will not be saved.

3) Layers

The Layers window includes content provided by Google Earth. This includes roads, 3D Buildings, terrain models, and variety of other themes.

4) Toolbar

The top menu bar offers options for marking-up the Google Earth view. One also save the mark-ups in the form of place marks, polygons, paths, and even add an image overlay or a photo.

5) Navigation

Over in the top right corner of the view screen, the navigation tools are available. These allow a user to zoom in, zoom out, change aspect, tilting to view the horizon and street view [4].

Method:

In the world of markup languages, there are many powerful tools that realize data managing, modeling, storing and displaying. Keyhole Markup Language (KML) is one of those tools that realizes these services and allows users to get results in Google Earth based on selected geographic features. KML developed by Google Company, is a descriptive markup language based on the syntax and file format of XML for describing and storing geographical information such as point, line, surface, three -dimensional, etc. On the basis of absorbing and referring the Geography Markup Language (GML) standards which is defined by Open Geospatial Consortium (OGC), KML gives away the depiction of topological relationship in geographical models, streamlines descriptive elements, and describes geographical information with a based -labelled syntax. KML was developed for doing with Google Earth. It lays out satellite photos, navigational charts and GIS on a three -dimensional earth's model, which is an information carrier contained namespace-qualified. A large amount of geographical information is integrated in the form of place mark on the Google Earth. To use this technology, what is transmitted directly between client-side and server-side is not spatial data, but pictures and KML documents. The process by which Google Earth displays KML documents is similar to the processing in which web browser opens HTML pages, namely, KML documents formed with KML standard, are explained and represented by Google Earth browser. The principles that how Google Earth works are similar to those used in internet explorer browser, Google Earth can view any KML files on the internet and have capable of saving those KML files to local computer, but contents are static instead of dynamic. If one wants to view KML as view HTML pages can be used the Google Earth browser [5]. See figure (2):

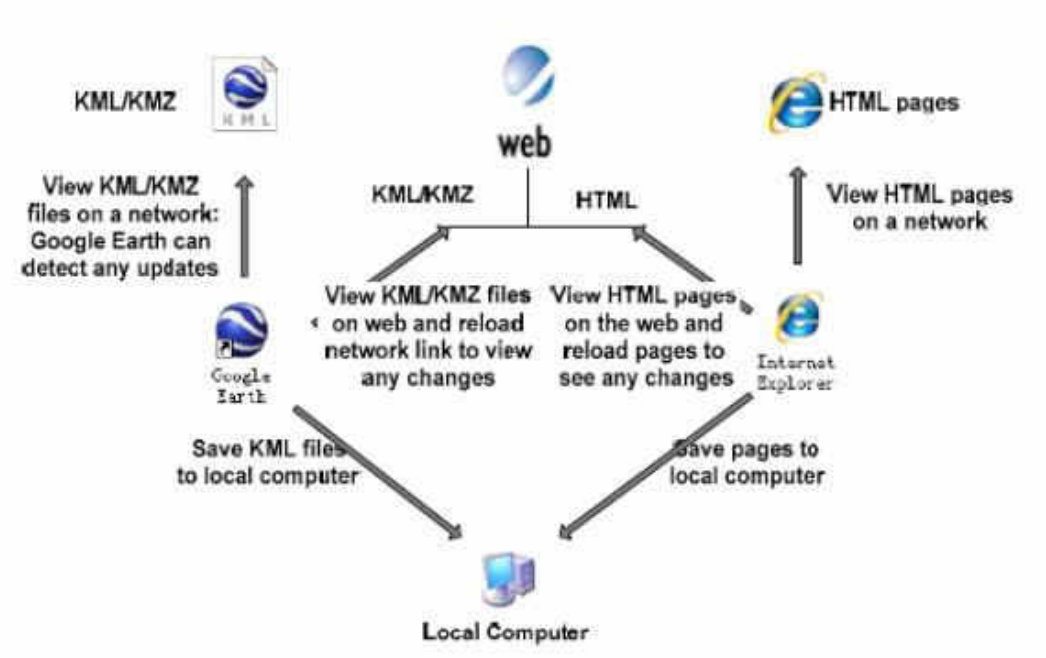

Figure (2): Google earth browser compared with web browser [5]

A KML file includes the following three parts:
1) XML Header: <?xml version="1.0" encoding="UTF-8"?>;
2) The definition of KML namespace:
<kml xmlns="http://earth.google.com/kml/2.1">;
3) The object of geographical indication. In a hierarchical structure, the object of geographical indication includes <name>, <description>, <LookAt>,<longitude>, <latitude>, <Point>, and so on..
In Figure (3) explain concept map produced from spatial analyst and geostatistical analyst in GIS convert to KML.

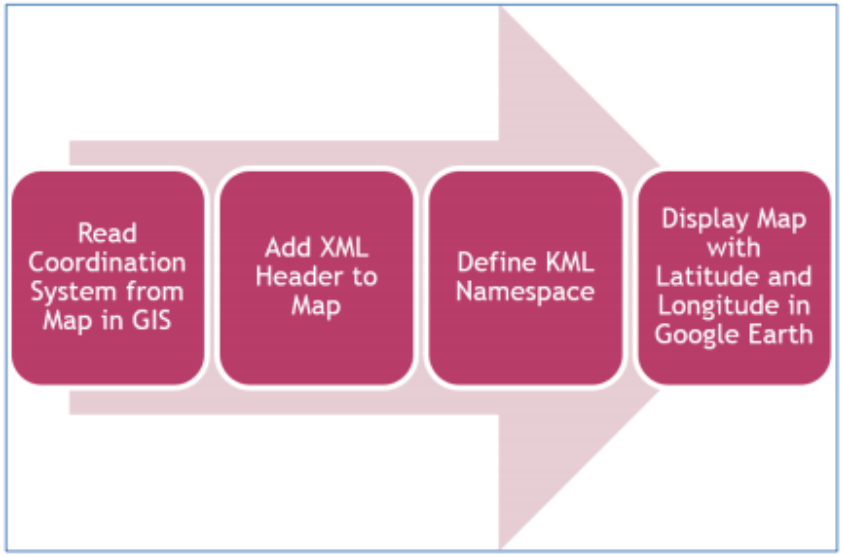

Figure (3): Converting map to KML block diagram

Discussion:

This is a very quick and simple way to create KML data from ArcGIS Desktop. The Map to KML geoprocessing tool allows multiple layers to be exported into a single KML source. The tool works on a single data frame within an ArcMap document and is an effective way of grouping many types of GIS data into a single shared unit see Figure (4).

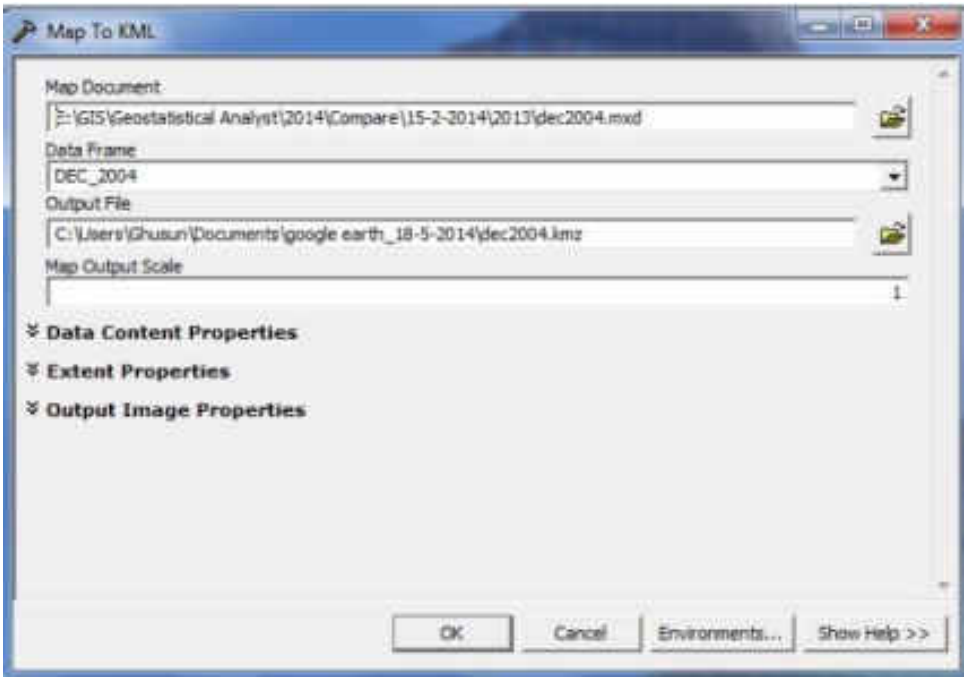

Figure (4): KML geoprocessing dialog box

Result:

Once the zipped KML (KMZ) file has been created, it can be distributed to others in a variety of ways. The simplest method is to simply send the file to the intended audience for example, through a mass email. Another option is to post the file on to a shared network location and advise users of the download location. Both of these methods are fully supported; as the KML contains all the display elements that it requires. To made optimal maps as more flexible to user , we used conversion tool (KML) for maps to open it in google earth, see Figure (5).

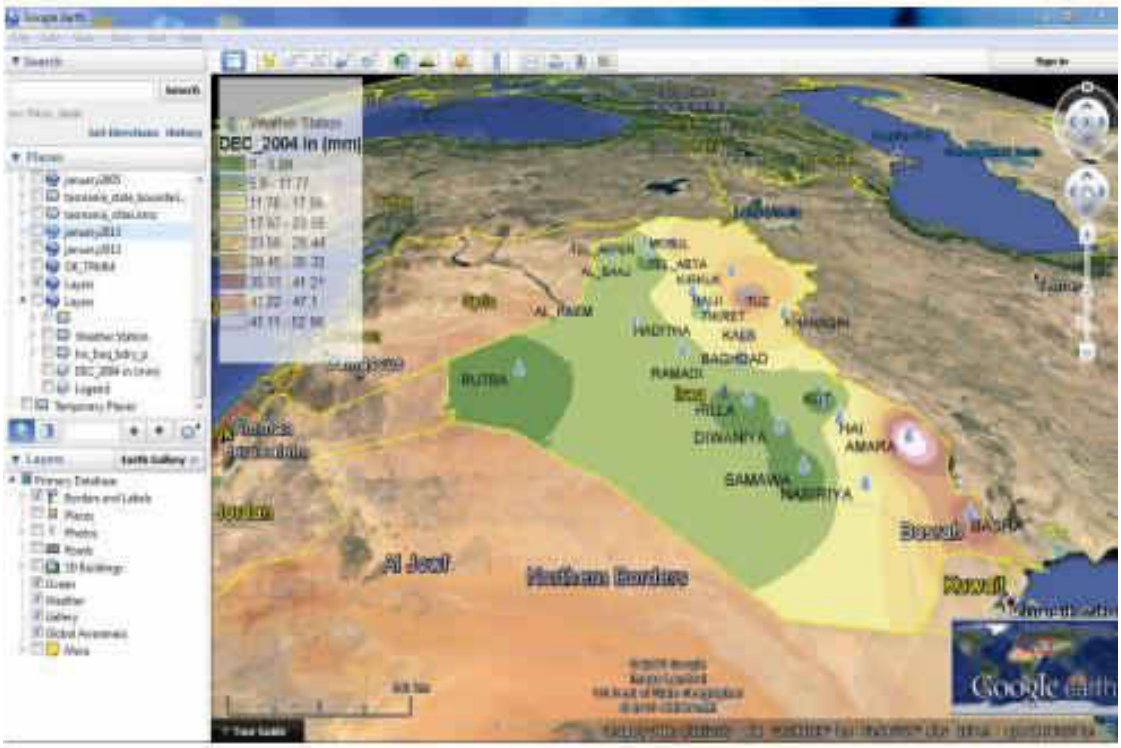

Figure (5): Map in google earth

Conclusion:

As a KML file can contain all the elements for data display, descriptions and behavior, it is a highly portable format that supports distribution requirements very well. KML is quickly becoming a popular and powerful part of the GIS interoperability story. This file is compressed using zip compression and will have a ".kmz" extension and can be read by any KML client including ArcGIS Explorer, ArcGlobe, and Google Earth.

References:

1. Office of Educational Partnerships, Tutorial Using Google Earth, Tutorial prepared for the Project-Based Global Climate Change Education Project, funded by NASA GCCE, Clarkson University, Potsdam NY,2011.
2. Janet Crossley, Google Earth as a geospatial tool for development organizations: mapping climate change vulnerability, M.Sc. in Geographical Information Science by Research Dissertation, the University of Edinburgh, 2008.
3. Marghany, J V Genderen, Three-dimensional slum urban reconstruction in Envisat and Google Earth Egypt, IOP Conference Series: Earth and Environmental Science, 2014, 18(1).
4. Andrew Nicholson, Using Google Earth, University of Toronto Mississauga Library Hazel McCallion Academic Learning Centre, February 2014.
5. DU Ying-jun, YU Chong-chong, Liu Jie, A study of GIS Development Based on KML and Google Earth, Fifth International Joint Conference on INC, IMS and IDC, Transcation in IEEE, 2009.