Google Earth for Surveyors
PLSO Conference
January 21, 2015

Bill Clark

Earth Point

Introduction

- Bill Clark, developer of Earth Point
  - www.earthpoint.us
  - bill.clark@earthpoint.us
  - 208.860.6311

Notes

- These notes are intended to complement the presentation.
- The presentation itself is a live demonstration of Google Earth.
- Slides and examples available at www.earthpoint.us/plso.aspx

Topics

- Getting started with Google Earth
- Township and Range Grid on Google Earth
- Texas Survey System on Google Earth
- USGS topo maps on Google Earth
- Calculate Polygon Area and Perimeter, and Line length and midpoint
- Map Excel Data
- Convert Coordinates (lat/long, state plane, PLSS, UTM, US National Grid)

Install Google Earth

- Install page is earth.google.com
- Google Chrome is also installed unless you request otherwise.
- Make sure you have “admin” rights to your computer, or find someone who does. Otherwise, you might have trouble opening Google Earth files.

Getting Started

- Daily reading
  - Google Earth Blog at www.gearthblog.com
- Learning
  - http://www.gearthblog.com/reference.html
  - Search Google for tutorials
  - Search YouTube for tutorials
- Contact Earth Point
  - bill.clark@earthpoint.us

Google Earth Settings - Tour Guide

- From the Google Earth menu, select “View”, then uncheck “Tour Guide”. This removes the strip of photos across the bottom of the screen.

Google Earth Settings – Options Menu

- From the Google Earth menu, select “Tools”, “Options”. A busy screen appears.
- Note the tabs across the top.

Google Earth – 3D View Tab

- Midway down on the left side is a the “Show Lat/Long” box. Select as desired. These options format the display of coordinates on Google Earth.
- To the right is the “Units of Measurement”. Select as desired. Formats the display of elevation on Google Earth.

Google Earth – Navigation Tab

- Midway down on the right side is a the “Navigation” box.
- Select the first option “Do not automatically tilt while zooming”.
- Uncheck the last option “Gradually slow the Earth while rotating or zooming”.
- Midway down on the left side is the option “Invert mouse wheel zoom direction”. I have this checked. To me the mouse wheel zoom is backwards with out it.

Google Earth – General Tab

- In the upper left corner is the “Display” box.
- Make sure “Show web results in external browser” is checked.

Google Earth – Save Options

- Click the “OK” button to save the options.

Google Earth – Layers

- Layers are shown in the lower left corner of Google Earth.
- If there are no windows on the left side of the Google Earth screen, select “View”, “Layers” from the Google Earth menu.

Google Earth – Layers

- The only layers I have checked are “Borders and Labels” and “Roads”. The rest are turned off as they clutter the screen.
- Also, drill into “Borders and Labels”, then into “Labels”. Uncheck “Islands” and “Geographic Features” as these can also clutter the screen.

The Basics

- Moving around – tilt, zoom, keyboard, mouse, press the “R” key to reset north up
- Fly To – lat/long or address
- Places – a folders view of the files you have loaded in Google Earth
- Layers - roads, photos, Google Earth Community
- Street View

Adding Content

- Add a folder.
- Plot locations, polygons, lines, and paths.
- Use Image Overlays to place scanned plat maps and enhanced areal imagery onto Google Earth
- Quick view of KML

Earth Point

- Provides several tools for Google Earth.
- Some have limits if the user has no subscription.
- This is a non-commercial presentation, free subscriptions are available to any class participant. Send a request to bill.clark@earthpoint.us

Earth Point Features

- View Township and Range Grid on Google Earth
- View Texas survey on Google Earth
- View USGS topo maps on Google Earth.
- Map spreadsheet data onto Google Earth using lat/long, state plane, UTM, and PLSS coordinates
- Convert coordinates from one system to another, for example UTM to State Plane, or State Plane to lat/long
- Calculate Polygon area and perimeter

Sign into your account

- Most features work better if you are signed into your account.
- A test account is available for today's session.
- Go to www.earthpoint.us
- Towards the upper left corner, click the "Sign In" link.
- User name is plso15
- Password is plso15

Earth Point PLSO demo account

- This account will expire in a few days, at which time any links you have loaded into Google Earth will start displaying pop-up messages.
- If this happens, delete the link from Google Earth and get your free account.
- Contact bill.clark@earthpoint.us

Township and Range Data

- Data is sourced from the BLM "Geocommunicator" service
- http://www.geocommunicator.gov/GeoComm/
- The data is extensively processed and cleaned up by Earth Point for display on Google Earth.
- There are approximately
  - 85,000 townships
  - 3,000,000 sections
  - 21,000,000 quarter-quarters

Township and Range Grid

- Go to the Earth Point Township and Range page at www.earthpoint.us/townships.aspx
- Make sure you are signed into your account.
- If no account, a pop-up message is displayed every ten minutes.
- Click the “View On Google Earth” button, under the heading “BLM Township, Range, and Section”
- If prompted, “Open” the file.

Township and Range Grid

- The file opens in Google Earth.
- Zoom into a western State.
- Township lines are orange, sections are purple, quarter-quarters are green.
- Mouse-over an icon to see the name.
- Click on the icon to see the details, such as area and corners.

Township and Range Grid

- To save the file permanently in Google Earth
  - Right click the “Earth Point Townships” folder
  - Select “Save to My Places” from the pop-up menu.
- The grid can be turned on and off by clicking the check-box to the left of the “Earth Point Townships” folder name.

Township and Range Lookup

- Go to the Township and Range page at www.earthpoint.us/townships.aspx
- No account is needed.
- Scroll down to “Convert Township and Range to Latitude and Longitude”
- Use the drop-down boxes to enter the township and range description.
- Click the “Fly To On Google Earth” button.

Texas Land Survey

- Texas does not use township and range.
- Texas has its own system.
- The data is available from the Texas Railroad Commission at http://www.rrc.state.tx.us/data/online/gis/index.php
- Earth Point grid is just like Township and Range, except the web page is www.earthpoint.us/TexasLandSurvey.aspx

USGS Topo Map

- Resulting from research program by the USGS and Microsoft Corporation, now hosted by ESRI.
- Earth Point wires the ESRI map into Google Earth.
- An Earth Point account is not needed.
- To get the map, go to www.earthpoint.us/topomap.aspx
- Use the transparence slider at the bottom of the Google Earth “Places” window to adjust the topo transparency.

Polygon Area

- Add a folder to Google Earth.
- Add a polygon to the folder.
- Right click the polygon or the folder.
- Select “Copy” from the pop-up menu.
- Go to www.earthpoint.us/Shapes.aspx
- Paste the polygon into the web page.
- Results can be displayed on the web page or returned in an Excel file.

Map Spreadsheet Data onto Google Earth

- The Earth Point “Excel To KML” utility maps spreadsheet data onto Google Earth.
- Several coordinate systems are supported
  - Latitude/Longitude
  - State Plane
  - UTM
  - MGRS, USNG
  - Township and Range (maps centroids)

Example Data

- Sample data for this example available at

  www.earthpoint.us/plso.aspx

Prepare Spreadsheet

- Prepare a spreadsheet of data.
- At a minimum, need latitude and longitude, or any of UTM, MGRS, PLSS, or state plane.
- Can also specify icons, text, pop-up descriptions, connecting paths, and more.
- Sample sheets are available at www.earthpoint.us/ExcelToKml.aspx

Sample Spreadsheet

- Latitude, Longitude

	A	B	C	D	E
1	**Latitude**	**Longitude**	**Name**	**Description**	**Icon**
2	44.938767°	-123.040555°	Grand Hotel	Site of 2011 PLSO conference	186

Sample Spreadsheet

- Position

	A	B	C	D
1	**Position**	**Name**	**Description**	**Icon**
2	10T 496800mE 4976149mN	Grand Hotel	Site of 2011 PLSO conference	186

Sample Spreadsheet

- Township and Range

	A	B	C	D
1	**TownshipAndRange**	**Name**	**Description**	**Icon**
2	OR Willamette S27 T7S R3W	S27 T7S R3W	Contains Grand Hotel	186

Map Spreadsheet

- Go to www.earthpoint.us/ExcelToKml.aspx
- Sign into your account.
- If no account, map is limited to 200 rows of data.
- Click the “Browse” button.
- Select the spreadsheet.
- Click the “View on Google Earth” button.
- Can also check spreadsheet for errors.

Convert Coordinates

- Individual coordinates can be converted at www.earthpoint.us/Convert.aspx
- State Plane coordinates at www.earthpoint.us/StatePlane.aspx

Batch Convert

- A spreadsheet of coordinates can be converted at www.earthpoint.us/BatchConvert.aspx
- Compatible with ExcelToKml spreadsheets
- Supports lat/long, UTM, MGRS, USNG, state plane, PLSS
- Plots centroids of PLSS grid, corners are coming…

Sample Spreadsheet

- Can include several coordinate systems on the same sheet.

	A	B	C	D	E
1	Latitude	Longitude	Position	TownshipAndRange	ToStatePlaneZone
2	43°36'34.86"N	116°12'23.30"W			1103
3	43 36 33.22	-116 12 18.40			1103
4			10S 577727mE 4341180mN		0402
5			12SVD9954691185		0202
6			2401 201995.535m 311469.941m		
7				WA Willamette T24-1/2N R9W	4601
8				19T4NR2WS21	2113

Coordinate Types
Row 1: Column Headings, can be in any order
Row 2: Latitude Longitude
Row 3: Latitude Longitude without punctuation
Row 4: UTM
Row 4: UTM
Row 5: MGRS
Row 6: State Plane
Row 7: Township and Range
Row 8: Township and Range, BLM "Landkey" format

Questions?

- Bill Clark
  - www.earthpoint.us
  - bill.clark@earthpoint.us
  - 208 860 6311