



Building Great PZ Maps

Low Cost and High Quality
Maps for Your Local Area



Why Care?

Whatever you do,
avoid the field where the library
used to be...



Discussion Topics

- Value and Elements of Good PZ maps
- Documenting areas of interest
- Publishing your map – the easy three
- Publishing your map – step up your game
 - Electronic Maps
 - Paper Maps



Value of “Good” PZ Maps

- Local Pilots – Maintain good relationships
- Visiting Balloonists – Stay safe and easy
- Landowners – Clear communication

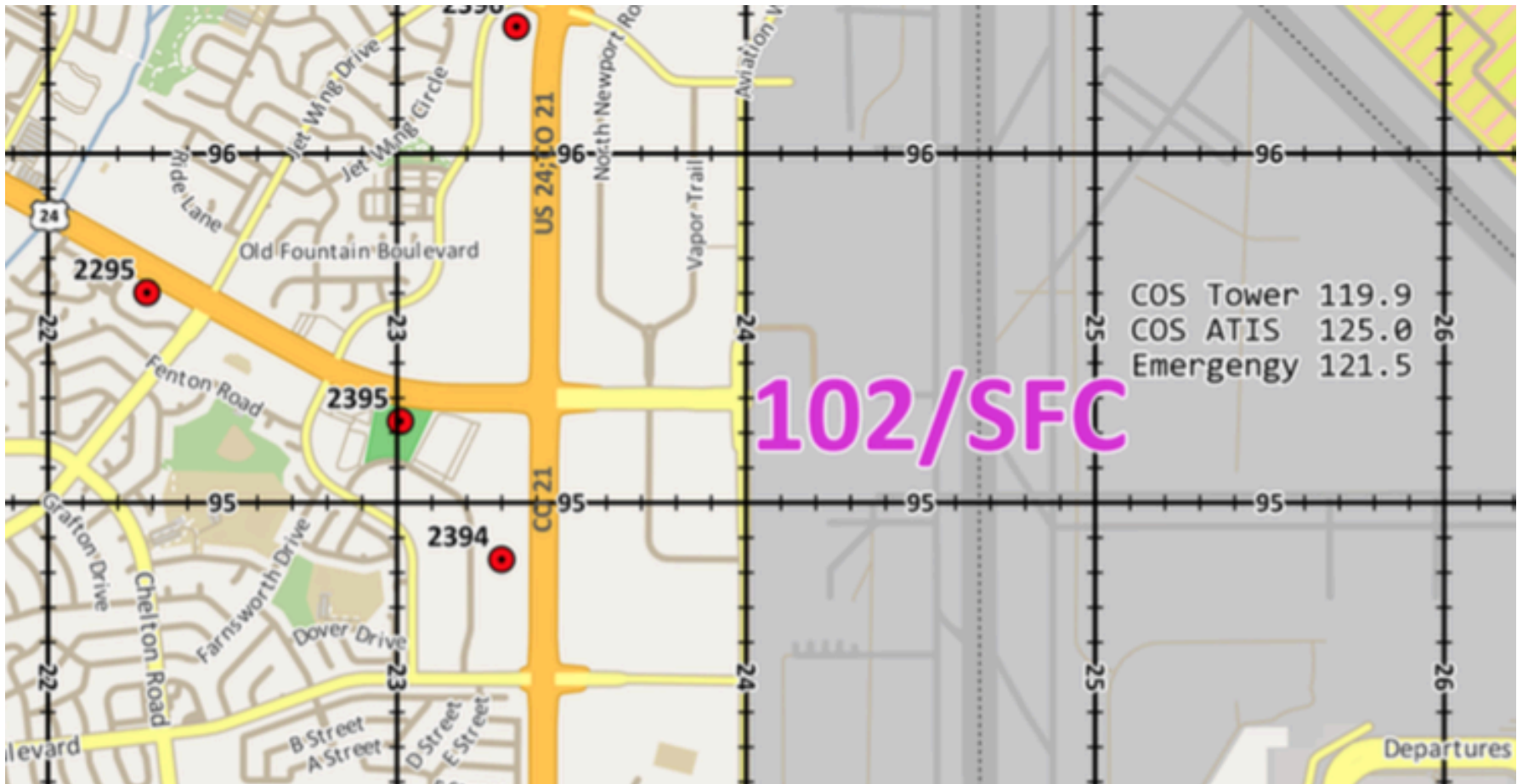
- Reduce confusion
- Proactive vs. Reactive
- Visual vs. Auditory



Elements of “Good” PZ Maps

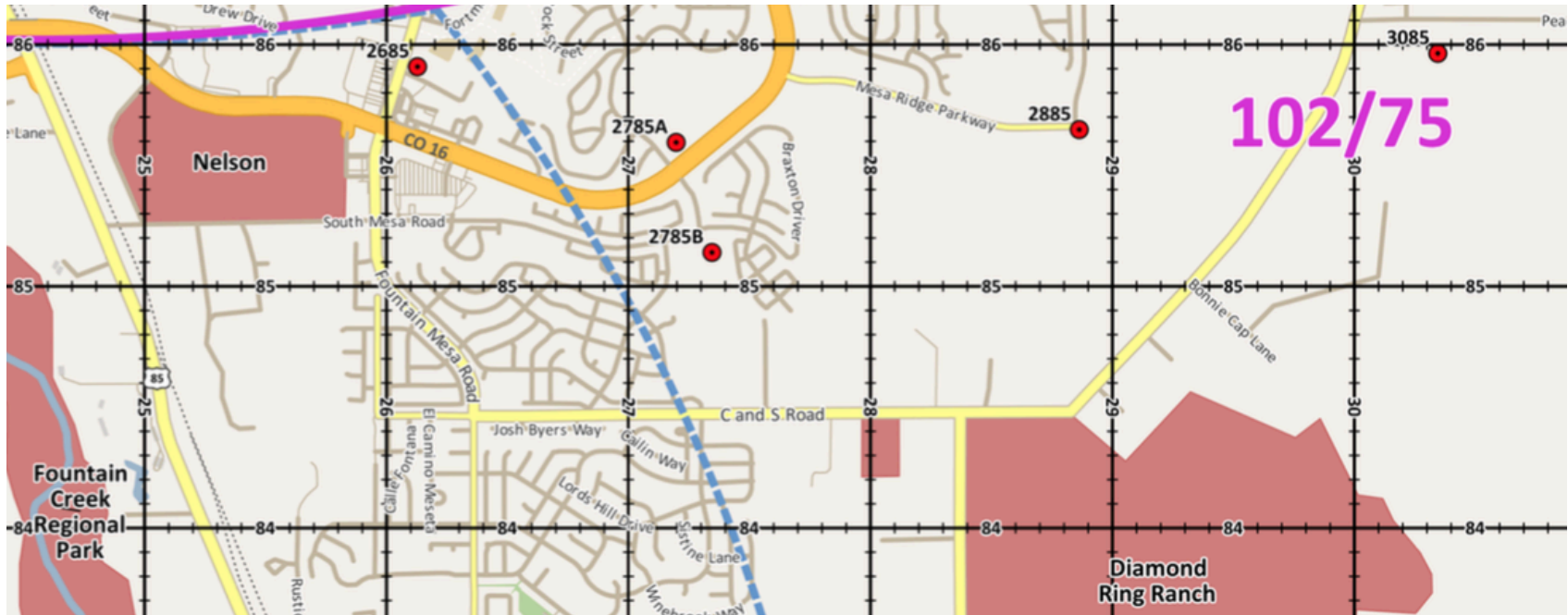
- Enough area to orient
- Include launch sites and other landmarks
- Coordinate system (preferably GPS)
- Airspace
- (Targets)
- Legend (and other documents)
- Readable, Accurate, Complete, and Current

Elements of “Good” PZ Maps

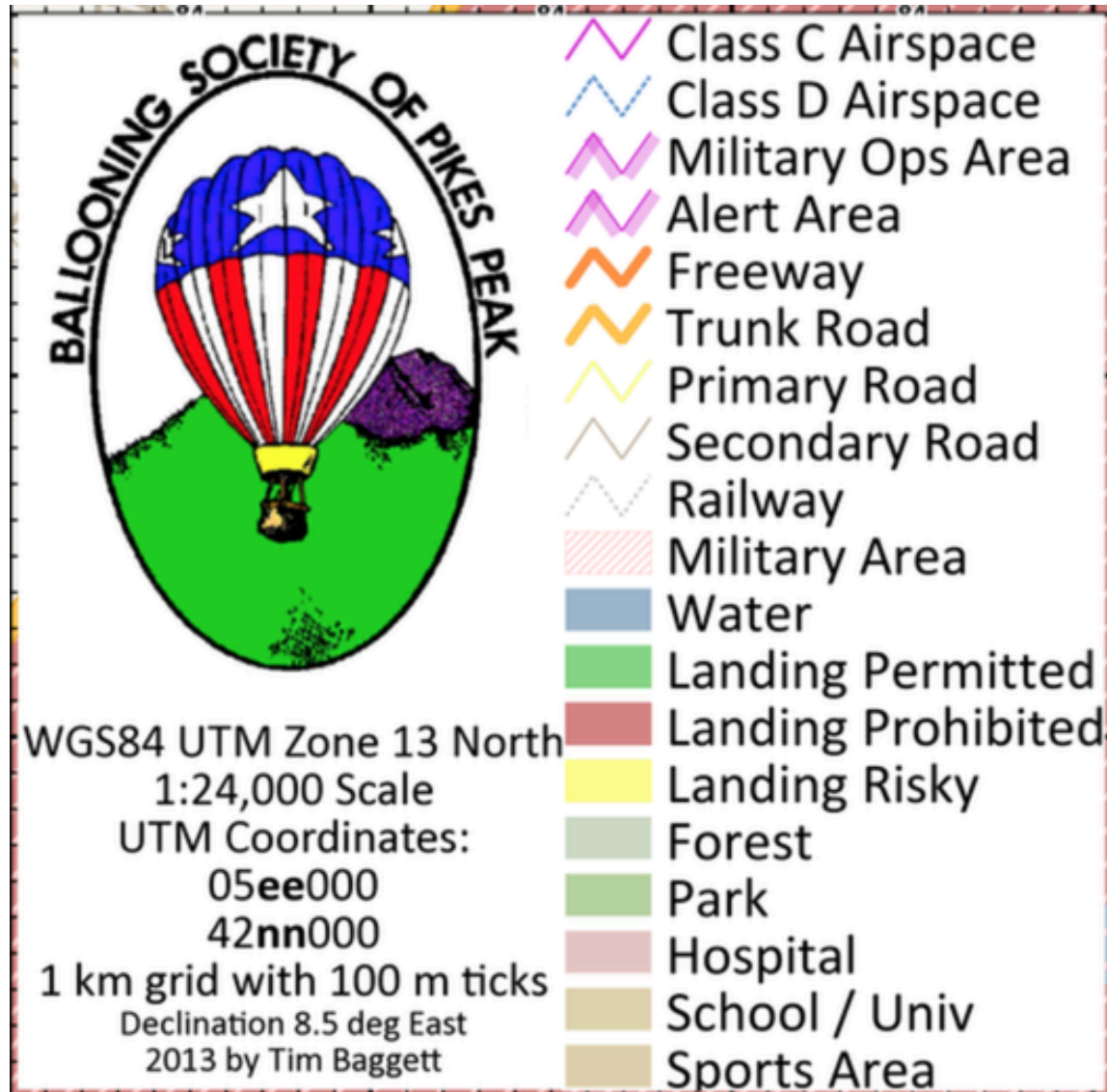




Elements of “Good” PZ Maps



Elements of “Good” PZ Maps





PZ Colors from BFA

- Orange – Minimum altitude, ok to launch
- Blue – Maximum altitude restriction
- Red – Minimum Altitude with no launch, landing, ground contact
- Red Roads - Minimum Altitude with no launch, landing, ground contact
- Yellow – No launch, landing, ground contact



Elements of “Good” PZ Maps



BSOPP Competition Targets

Goal	Description	UTM 13 North		WGS84		Altitude	
		Easting	Northing	Longitude	Latitude	meters	feet
1797	Memorial Park	517531	4297847	-104.7980	38.8292	1854	6082
2104	Gary Born Launch Site	521458	4304668	-104.7526	38.8906	1959	6427
2196	Murray Blvd	521853	4296732	-104.7483	38.8191	1842	6043
2201	Payton Cir	522325	4301051	-104.7427	38.8580	1912	6272
2203	Penrose Park	522120	4303397	-104.7450	38.8792	1962	6437
2290	Cable Ln	522975	4290791	-104.7355	38.7655	1783	5849
2291	Lincoln Plaza and Bradley	522459	4291200	-104.7415	38.7692	1791	5875
2293	Soaring Eagles Elementary	522868	4293003	-104.7367	38.7855	1817	5961
2295	Jet Wing & Fountain	522284	4295601	-104.7433	38.8089	1842	6043
2296	Wildflower Park	522586	4296667	-104.7398	38.8185	1851	6072
2303	Homestead Park	523618	4303248	-104.7277	38.8778	1999	6558



Document Areas of Interest

- Drive around – what do you see?
- Talk to people – Landowner preferences
- Take your GPS / iPhone / iPad
 - Mark a waypoint
 - Take a screen shot
- Capture in Google Earth
- Talk to people again
 - “Is this the right boundary?”
 - What if they are lying?



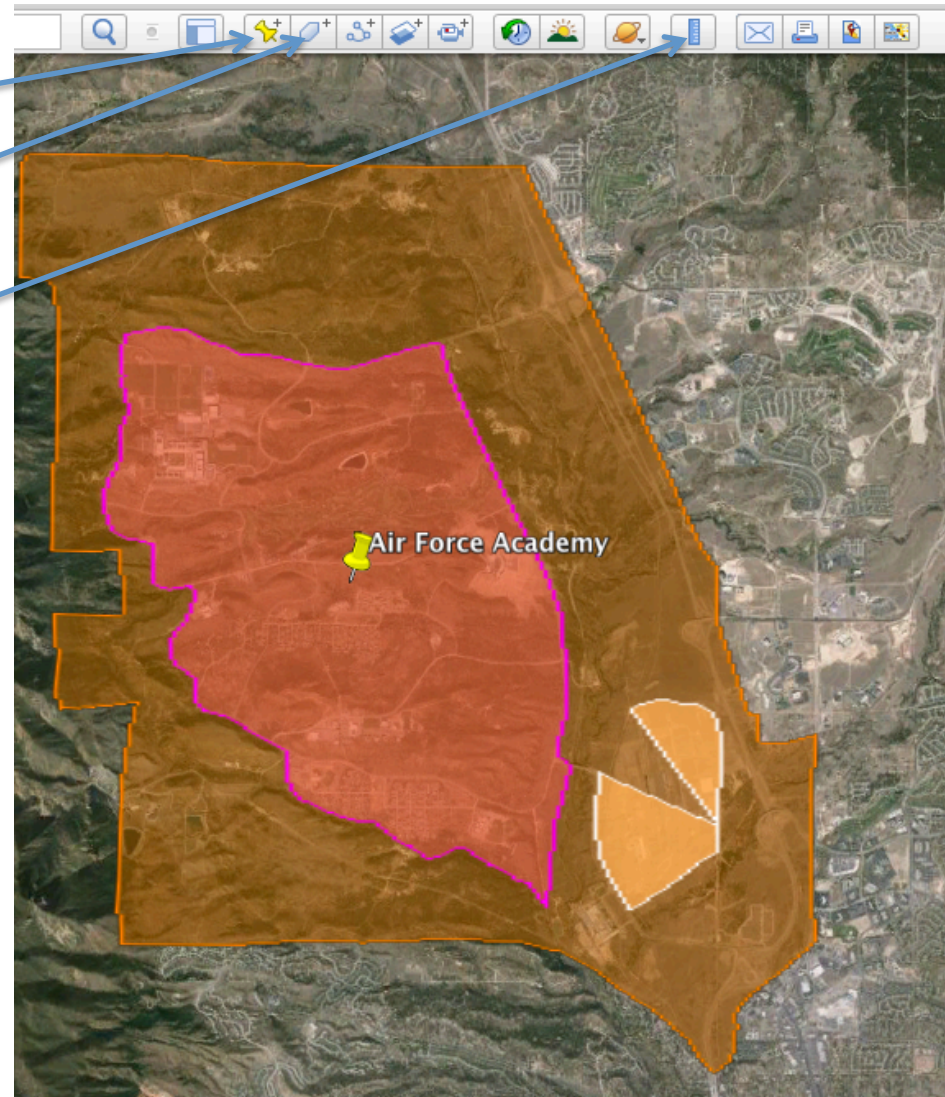
Google Earth is Your Friend

- Free application
- Platform independent (PC, Mac, mobile...)
- GPS Coordinates (any format)
- Satellite Imagery
- Import and Export capability
- Easy to Use



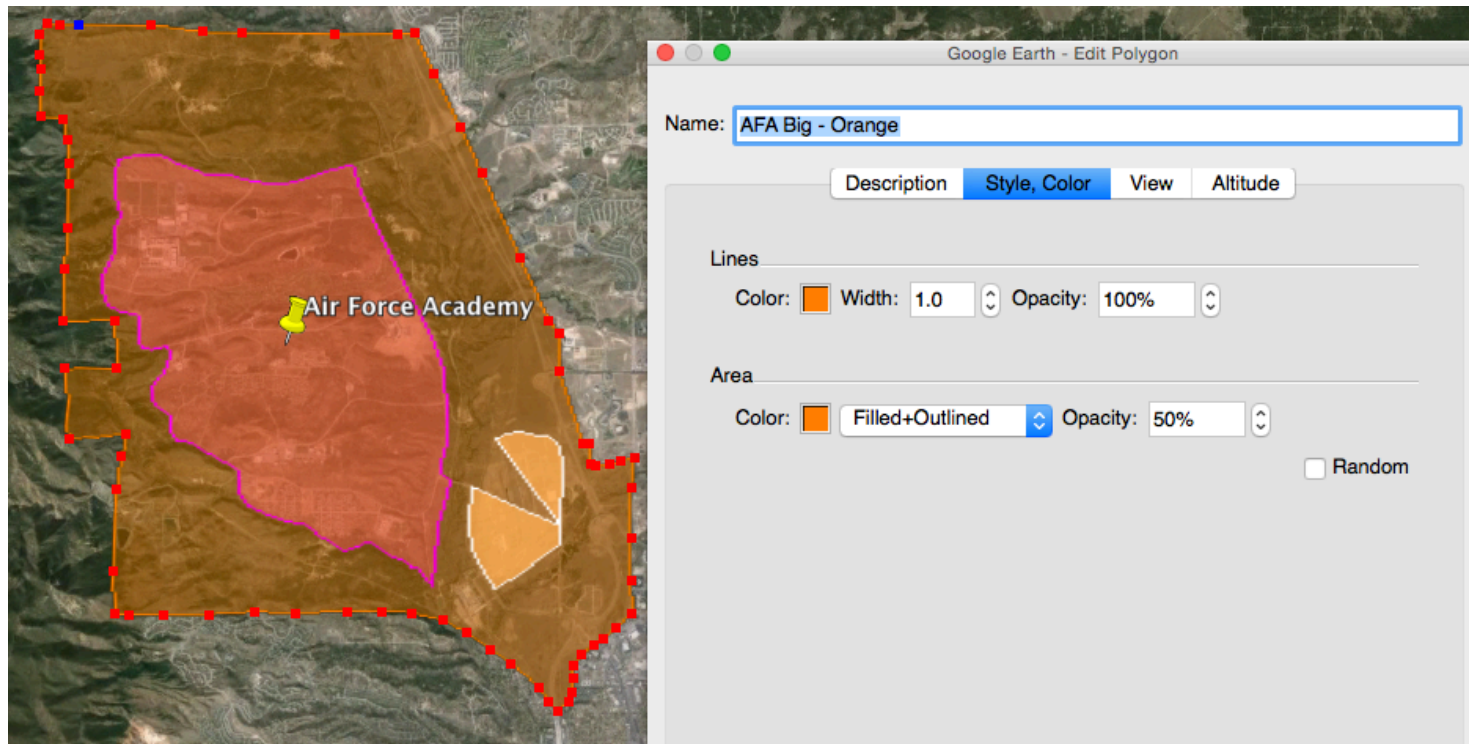
Google Earth is Your Friend

- Points
- Polygons
- Measuring



Google Earth is Your Friend

- Polygons – Practice makes perfect



Google Earth is Your Friend

Plug-ins to consider

– Aviation Charts

<http://www.chartbundle.com/charts/kml/sec.kml>



UTM Grid

http://www.nearby.org.uk/google/grid_utm.kmz.php?

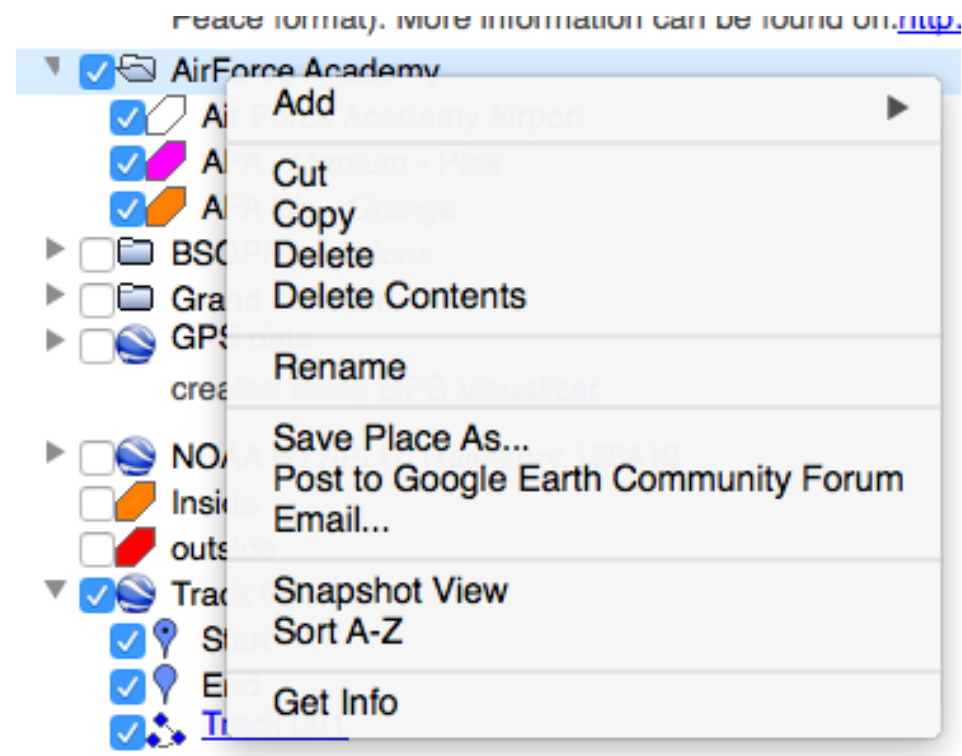
GPS Visualizer – Rings, Upload, etc.

<http://www.gpsvisualizer.com/>

Publishing Your Map – Easy Three

1. Right Click on FOLDER – Save Place As
 - KML / KMZ File to share via email

2. Print the screen
 - File / Print
 - Screen Capture
 - Save as PDF

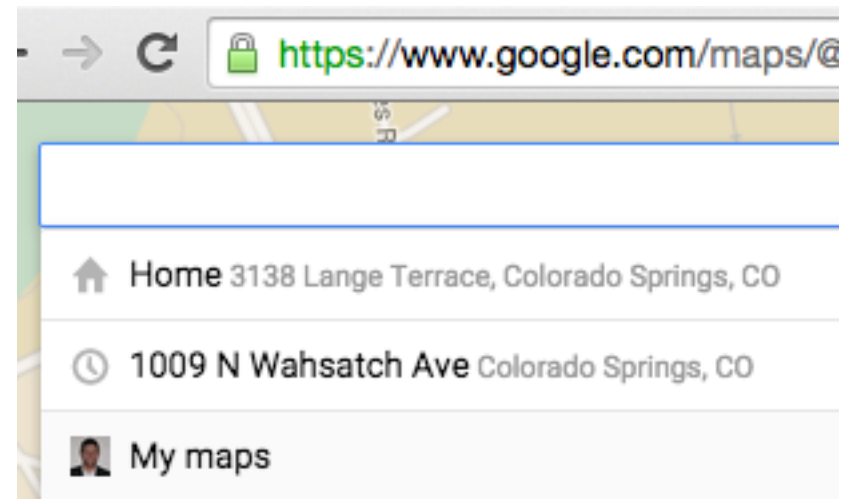




Publishing Your Map – Easy Three

3. Right Click on FOLDER – Save Place As

- KML / KMZ File saved
- From your Google account, My Maps
- Upload that KML file
- Share the Link
 - Email
 - Website
 - <http://bsopp.com/>





Publishing Your Map – Step Up

- Send that KML file to your mapping expert!
 - Include a “map boundary” rectangle

Digital Cartography Basics

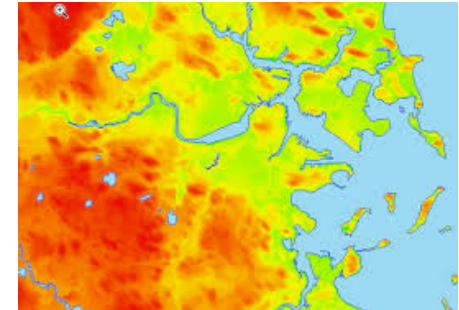
Introduction to creating your own
maps from scratch

Why?

- You control what is displayed and how
 - Google doesn't show airspace
 - Make some features more or less prominent
- Web maps do not scale to large format
 - Intended for computer screens, not paper
- Licensing issues
 - Can you really use someone else's base map?
- Disconnect from the Internet

Map Data

- Raster (GeoTiff)
 - Think satellite images
 - Limited resolution
 - Can require HUGE files, or horribly compressed
 - Usually causes blurring or reduction in resolution
 - Limited information
 - Useful for map base layer



- Vector (KML)
 - Points, Lines, Polygons
 - Infinite resolution
 - Smaller file size
 - Attach any type of information

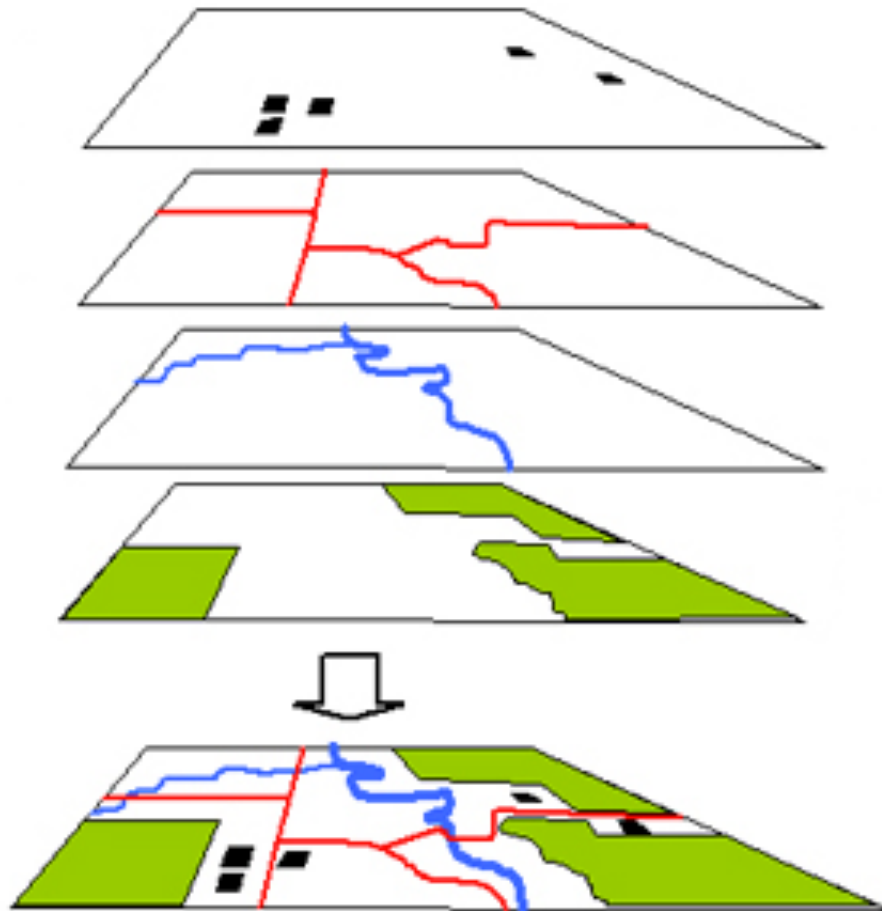
Map Data

- Where do you get it? Any where you can!
 - Local / regional governments
 - Watch out for different datum / coordinate systems
 - Federal government (US Census Bureau)

- OpenStreetMap
 - Community mapping project
 - Find an error? Then fix it yourself.
 - No cost, just display proper copyright attribution
 - <http://www.openstreetmap.org/about>



Maps Are Made in Layers



Building layer (point)

Road Layer (line)

River Layer (line)

Park Layer (polygon)

Layers are combined to form a detailed map.

Open vs. Closed Source

- Closed Source
 - ESRI
 - Industry heavy-weight
 - Closed source (stuck with what they give you)
 - Expensive
 - Others, but trivial (Delorme, Autocad)
- Open Source GIS
 - Community developed
 - Often free - as in beer
 - Certainly free - as in freedom
 - You can spend \$\$\$ for support or special development

Map Creation and Rendering

- QGIS Desktop GIS

- Interactive desktop application for data viewing, editing, analysis, and publishing

- Pikes Peak flight map in Ballooning was rendered with QGIS

- <http://www.qgis.org/>



-  **MapServer**
open source web mapping

- Map rendering for web mapping applications

- BSOPP map was rendered using MapServer

- <http://mapserver.org/>

Data Storage

- PostgreSQL Database
 - Requires PostGIS extensions
 - <http://www.postgresql.org/>



- PostGIS
 - Spatial and Geographic objects for PostgreSQL
 - <http://postgis.net/>

Critical Libraries & Tools

- GDAL – Geospatial Data Abstraction Library
 - Translator tool for 138 raster data formats
 - Includes OGR for translating 82 vector data formats
 - Many other raster/vector utilities
 - <http://www.gdal.org/>
- PROJ.4 – Cartographic Projections Library
 - Convert data from one earth model, coordinate system, or map projection to another.

Web Browser Map Applications

- Leaflet
 - My current favorite
 - Used for Two Eagles tracking
 - Designed for simplicity, performance, and usability (if you know Javascript)
 - Doesn't do a lot, but many plug-in extensions available
 - <http://leafletjs.com/>

Web Browser Map Applications

- OpenLayers 2
 - My old favorite
 - America's Challenge maps
 - Loads of features!
 - Big and heavy, sometimes slow
 - Lots of books available for documentation
 - Getting quite dated
 - <http://openlayers.org/two/>

Web Browser Map Applications

- OpenLayers 3
 - Complete rewrite of OpenLayers
 - Modular
 - Faster
 - Smaller
 - <http://openlayers.org/>

For more information

- Cartographical Map Projections
 - <http://www.progonos.com/furuti/MapProj/Normal/TOC/cartTOC.html>
- GeoJSON
 - Efficient standard for transfer of vector map data to a web browser
 - <http://geojson.org/>
- Open Source Geospatial Foundation (OSGeo)
 - <http://www.osgeo.org/>
- Open Source GIS tools for Windows (OSGeo4W)
 - Single installer for many OS GIS tools
 - QGIS, Mapserver, GDAL/OGR, PROJ4
 - <http://trac.osgeo.org/osgeo4w/>

Find a Community

(or, where to find local talent)

- Geospatial Meetups
 - <http://geospatial.meetup.com/all/>
- OpenStreetMap User's Groups
 - <http://usergroups.openstreetmap.de/>
 - <http://openstreetmap.meetup.com/all/>
- Maptime Meetups
 - <http://maptime.meetup.com/all/>
- OSGeo Chapters
 - http://wiki.osgeo.org/wiki/Local_Chapters



Discussion Topics

- Value and Elements of Good PZ maps
- Documenting areas of interest
- Publishing your map – Quick and Easy
- Publishing your map – Digital Cartography

Questions?



Thank You!

Slides found at

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