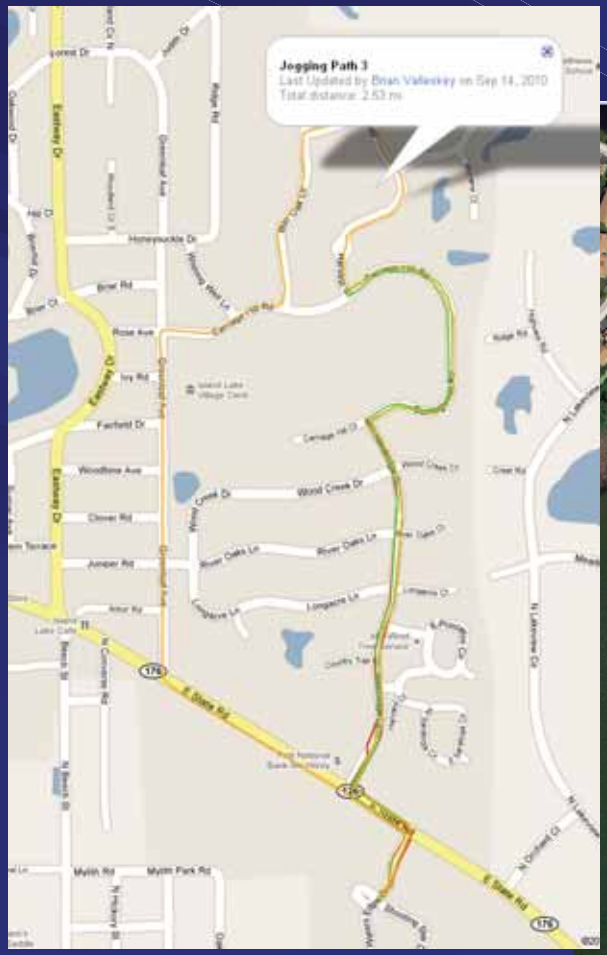
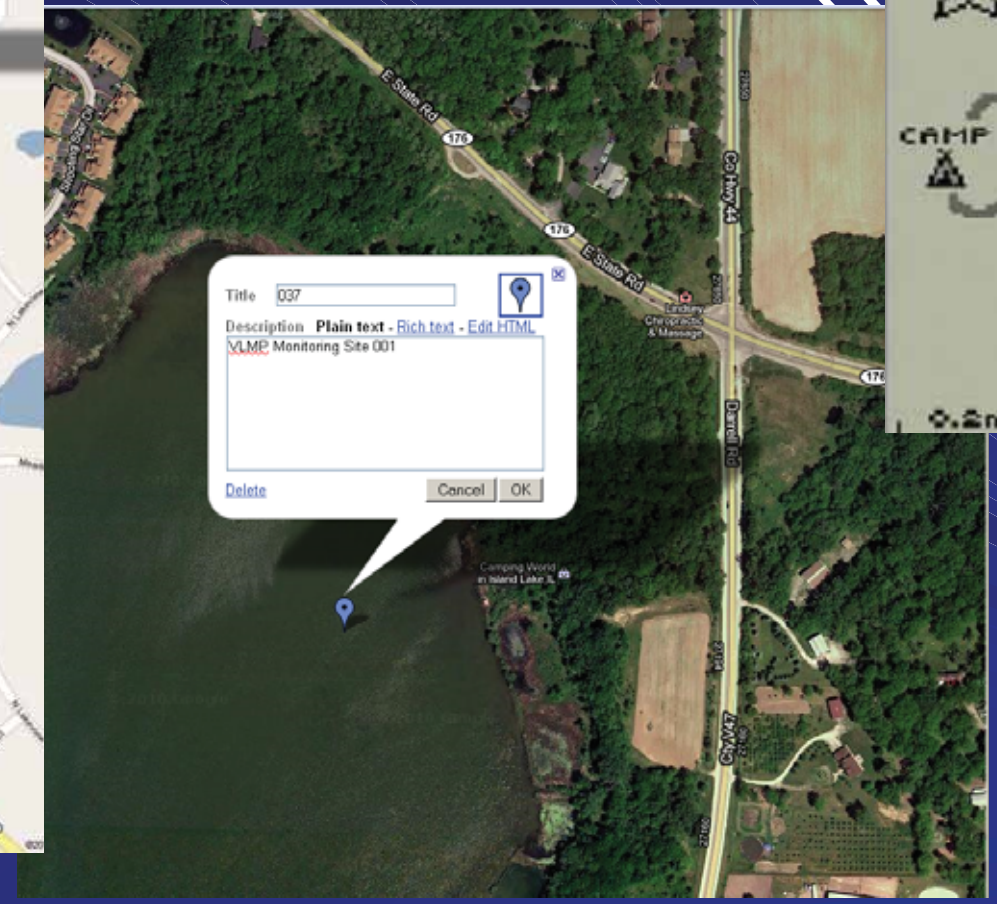
FREE MAPPING RESOURCES TO ENHANCE THE USE OF YOUR GPS





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Workshop Outline

- Introduction
- Freeware data discussion and types (GIS data/GPS data)
- GPS and GPS theory basics
- Freeware internet mapping applications (Google & Bing)
- GPS data capture and downloading (Using Garmin Etrex)
- Case Study – Real World Application (VLMP example)
- Alternative Case Study – Build your own

Free Mapping Resources to Enhance the use of your GPS

Geographic Information Systems (GIS) [illegible] data

- Aerial Photography
- USGS topographic maps
- Bathymetric lake maps
- Internet base maps

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Image Data Types (Raster)

Aerial & Satellite Imagery

USGS Topographic Maps

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Vector Data Types

Field Collected data (survey/GPS)

Digitized Map data (roads, stre ms tc)

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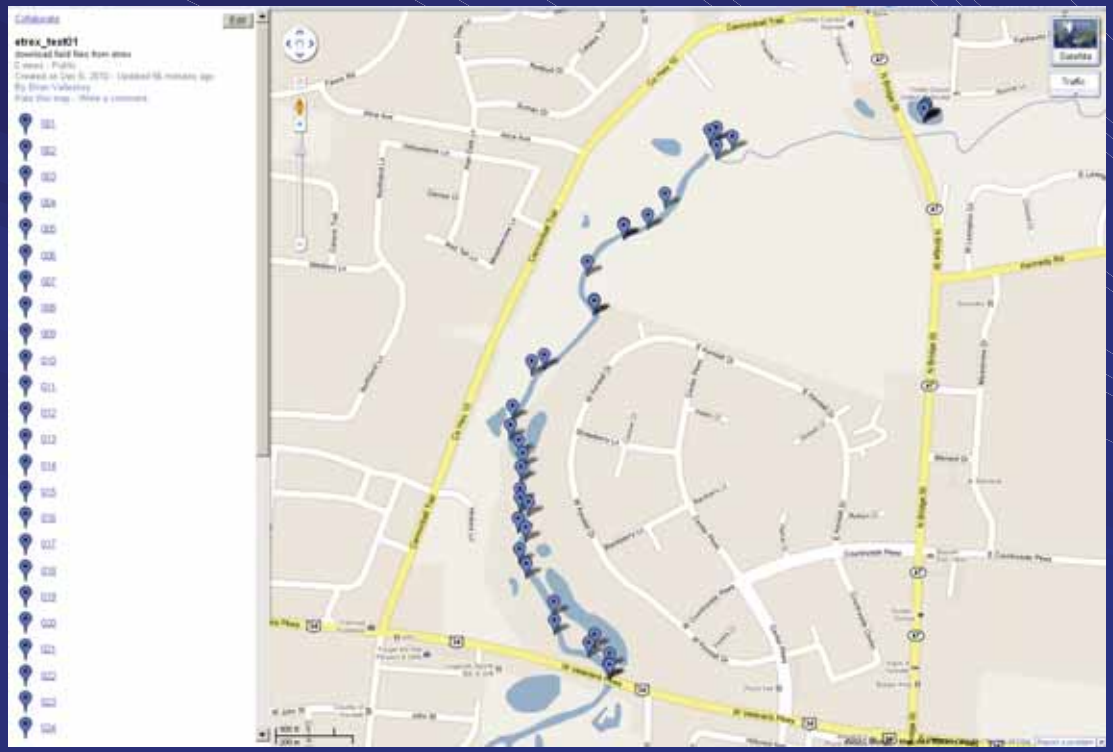
GPS field data from stream inventory overlain on Google



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- How it is used by Lake County
- Free Lake County Assessor's information GIS [illegible]
- GIS Contour info Collected by LMU
- Natural Resources Inventories
- Existing data sites
  - Illinois Geospatial Data Clearinghouse
  - Greenmapping.org
  - GeoCommunity.com
  - US National Atlas

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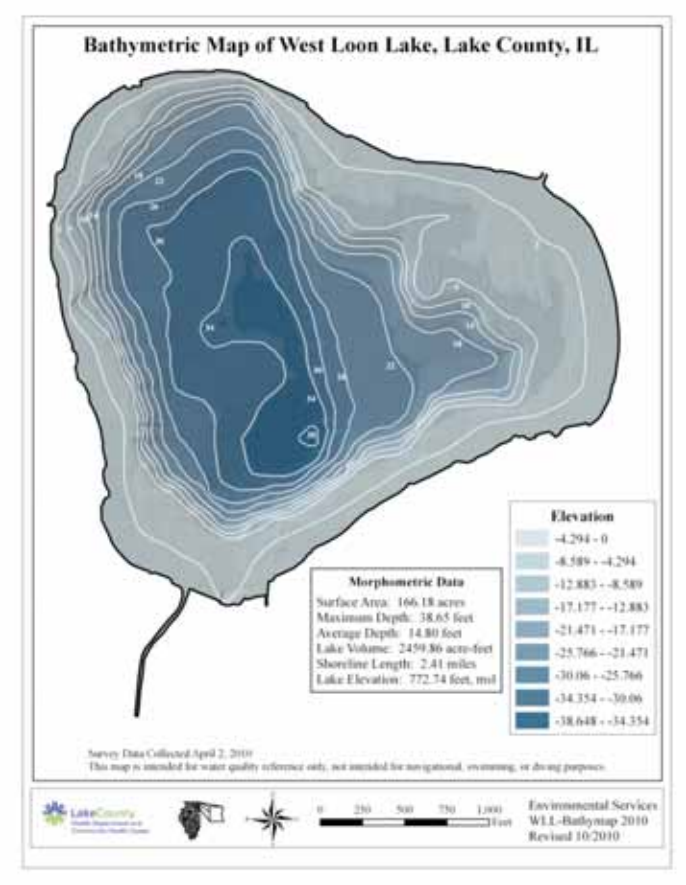
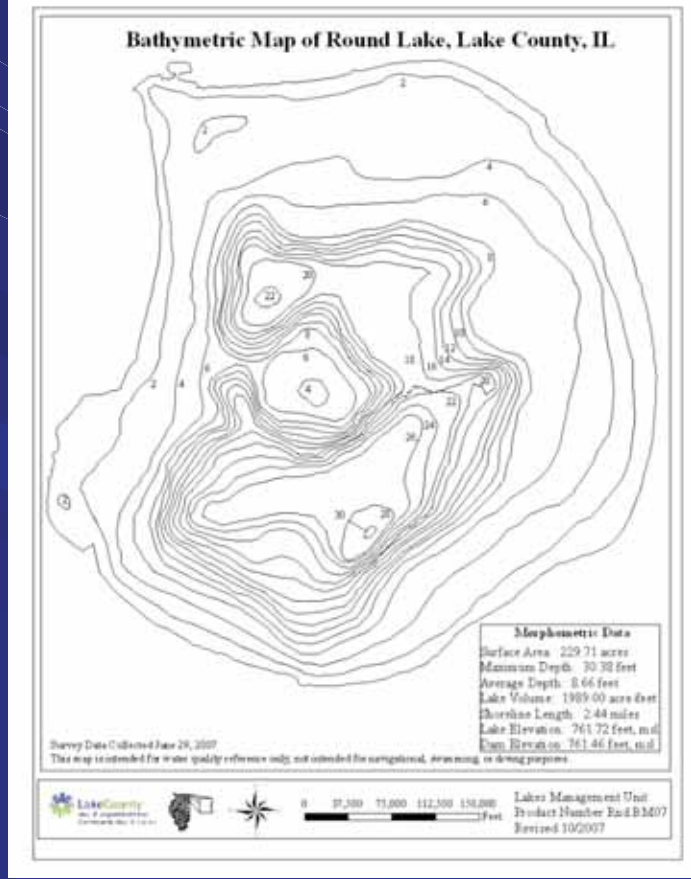
Bathymetric Mapping

A service of the Lake County Health Depa[illegible]
Environmental Services





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Equipment Used

BioSonics DTX Echosounder and Software

Laptop Computer

GPS

Boat

ArcMap GIS Software

Surveying equipment

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Field Data Collection

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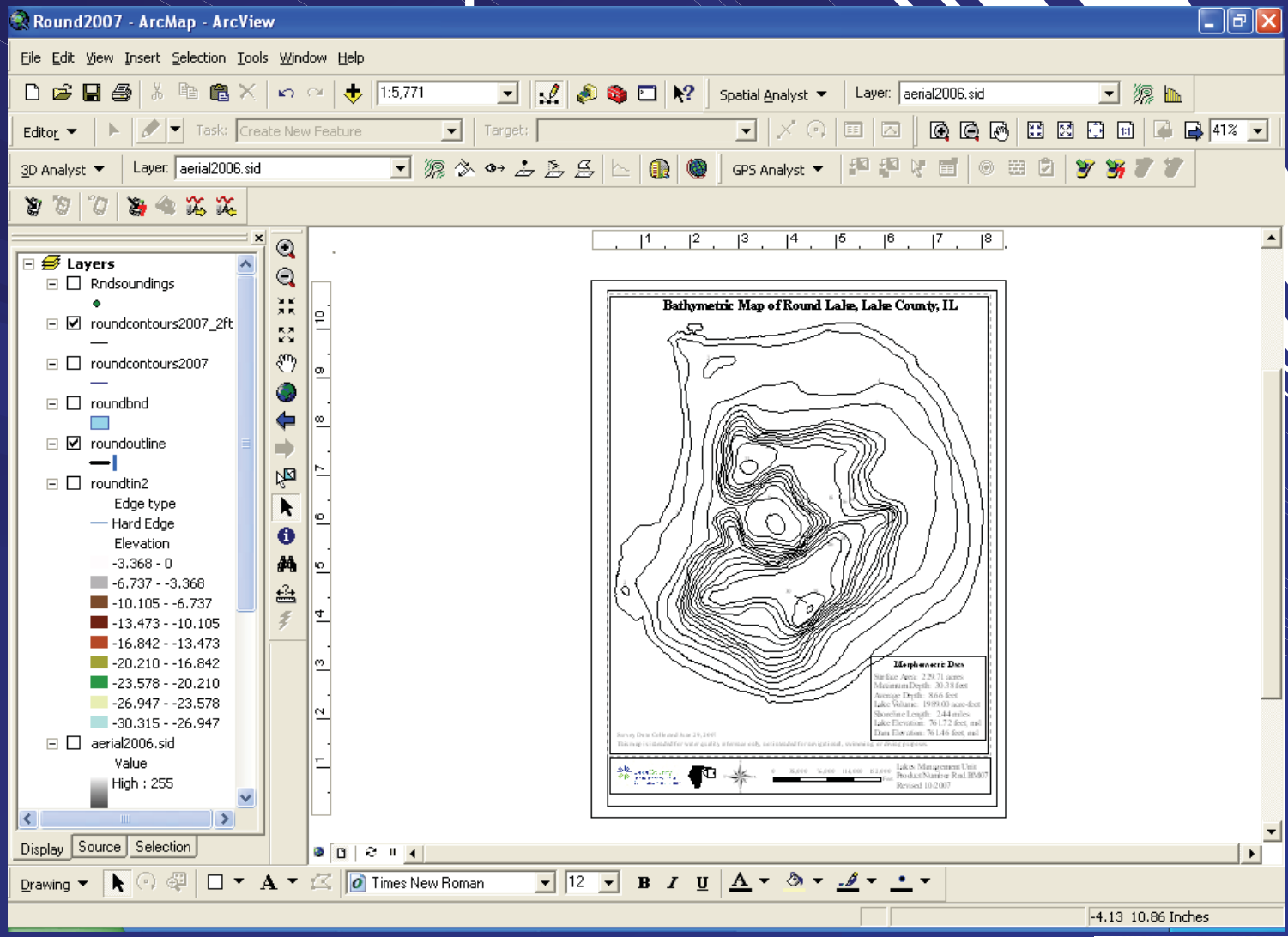
Map Creation



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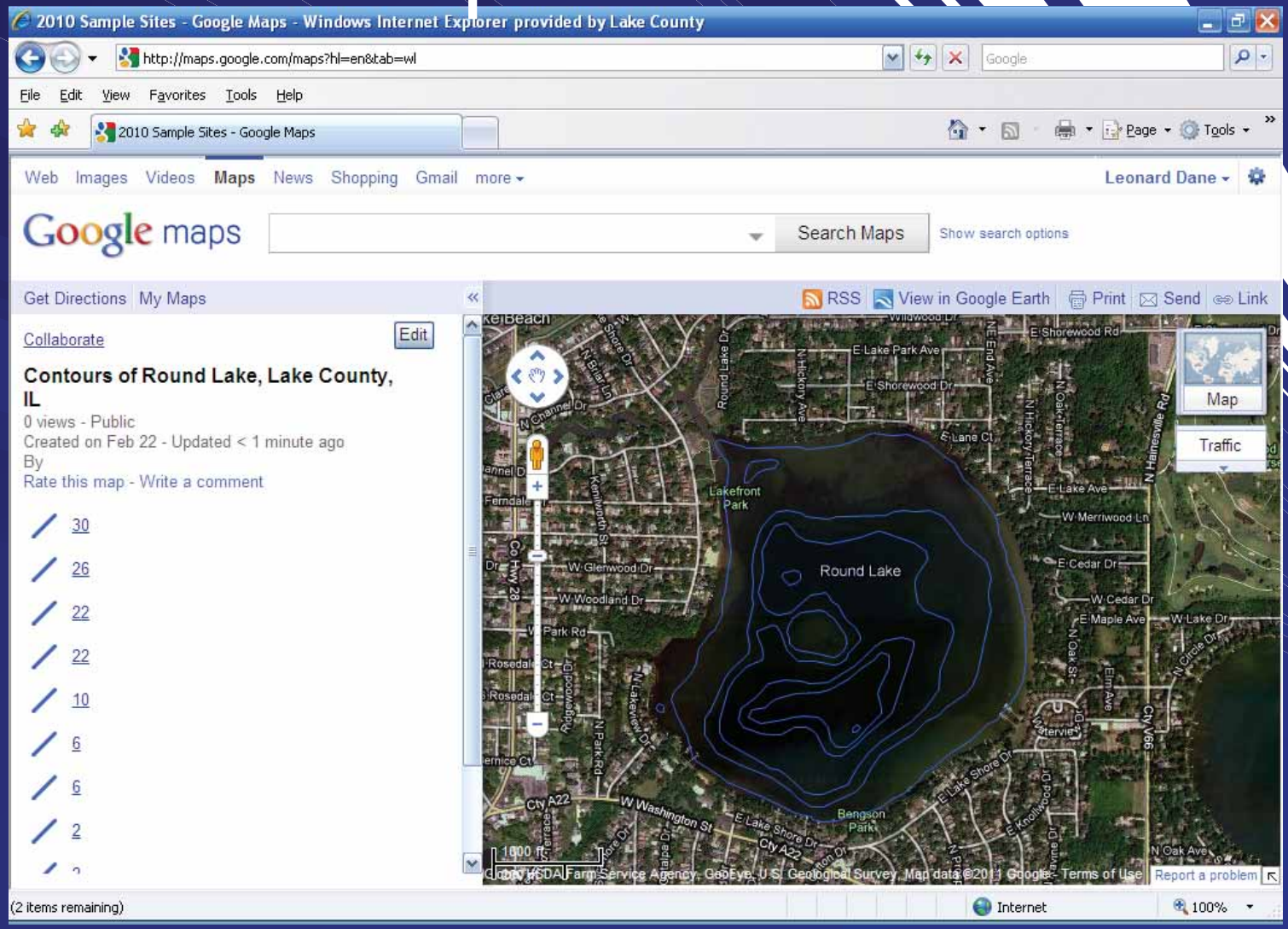
Map Creation



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Full Blown Mapping Applications

- ESRI ArcView and ArcINFO
- MapWindow (freeware)
- Grass/QGIS (freeware)
- AutoCAD
- MicroStation

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Internet Mapping- the new revolution

- Google Maps
- Google Earth
- Live Maps
- Bing Maps
- Terra Server
- Map Quest

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Internet Mapping- the new revolution

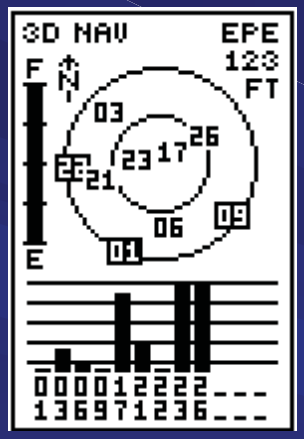
Uses Keyhole Mark-up Language (KML) file structure to post data set onto the internet and share

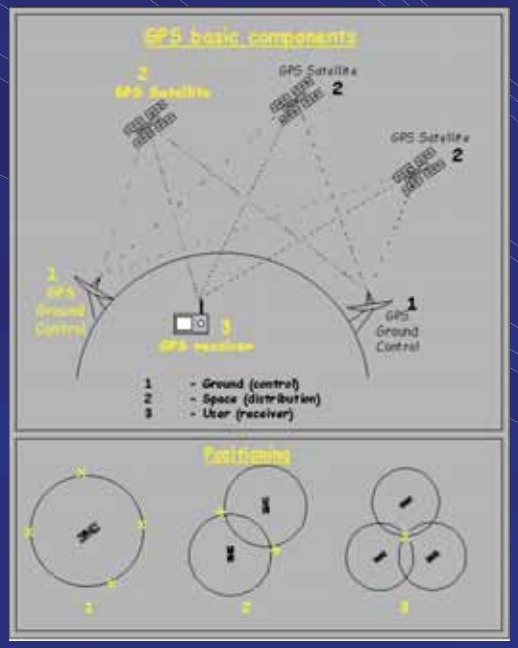
- Embed in webpages
- Share through email
- Many other various applications

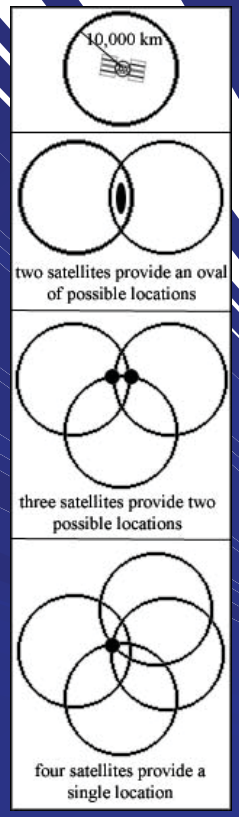
Free Mapping Resources to Enhance the use of your GPS

Geographic Positioning System (GPS)

GPS Theory







There are over 8000 satellites currently orbiting the earth

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Common GPS Collection Devices

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Common GPS Collection Devices

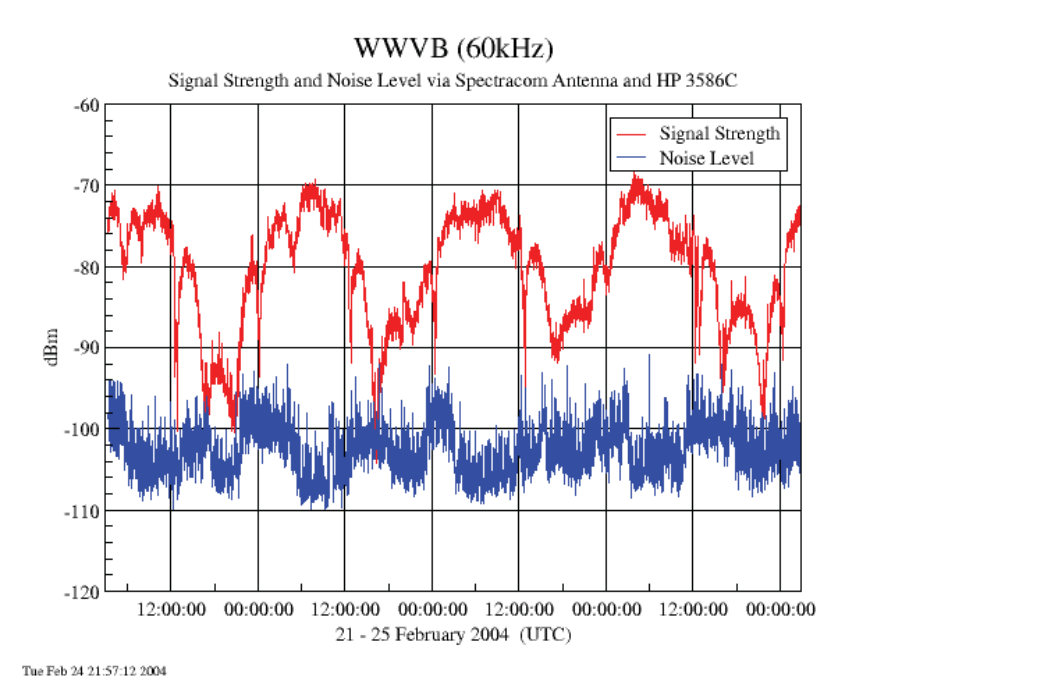
GPS data collection issues – b[illegible] s[illegible]

•Signal to Noise Ratio (SNR) – ground Interference that reduces signal strength

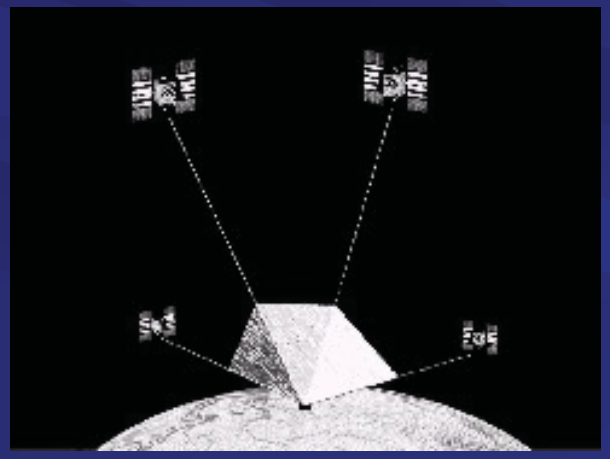
•Particle Dilution of Precision (PDOP) – Angle of satellites in relation to receiver impact Accuracy

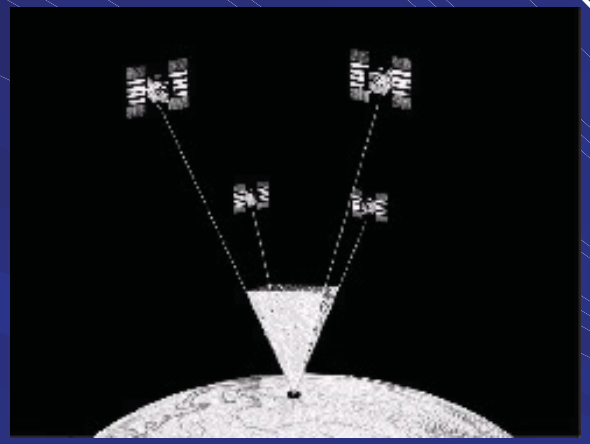
•Multipath – signal bounce off of adjacent object surfaces

Signal to Noise Ratio (SNR)

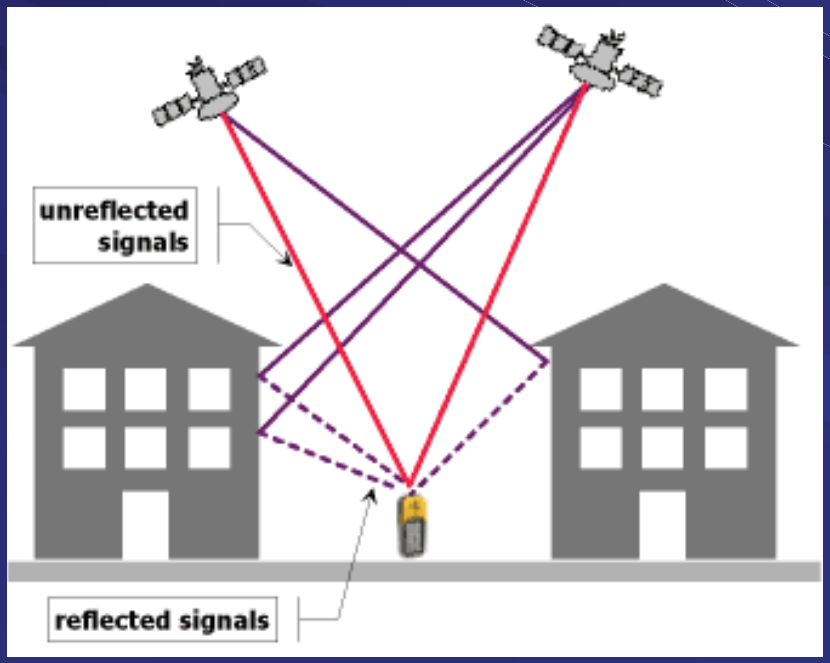


Particle Dilution of Precision (PDOP) – ng of satellites in relation to receiver impact accuracy





Multipath – signal bounce off of adjacent object surfaces



Free Mapping Resources to Enhance the use of your GPS

Google Earth, Google Maps, Bing & Others

- Google Earth – Standalone downloadable application
- Google Maps – internet based mapping
- Bing Maps – MSN's answer to Google Maps
- County navigational websites

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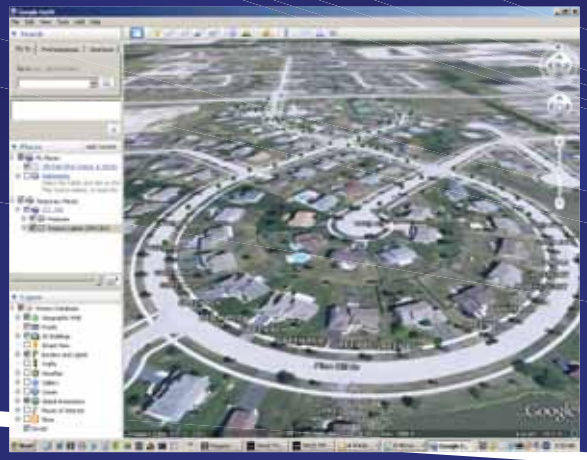
Google Earth

Outperforms most online mapping programs



http://www.google.com/earth/download/ge/agree.html

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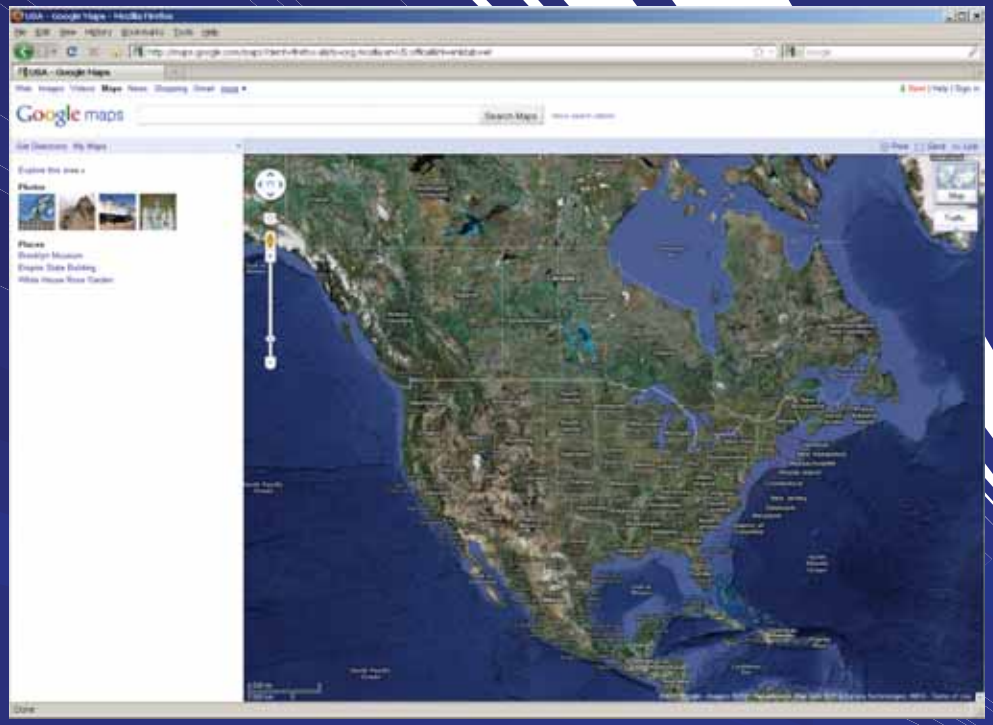
Google Maps

Your basic online – get directions mapping service

Requires a Google Account

Excellent additional map content

http://maps.google.com/maps



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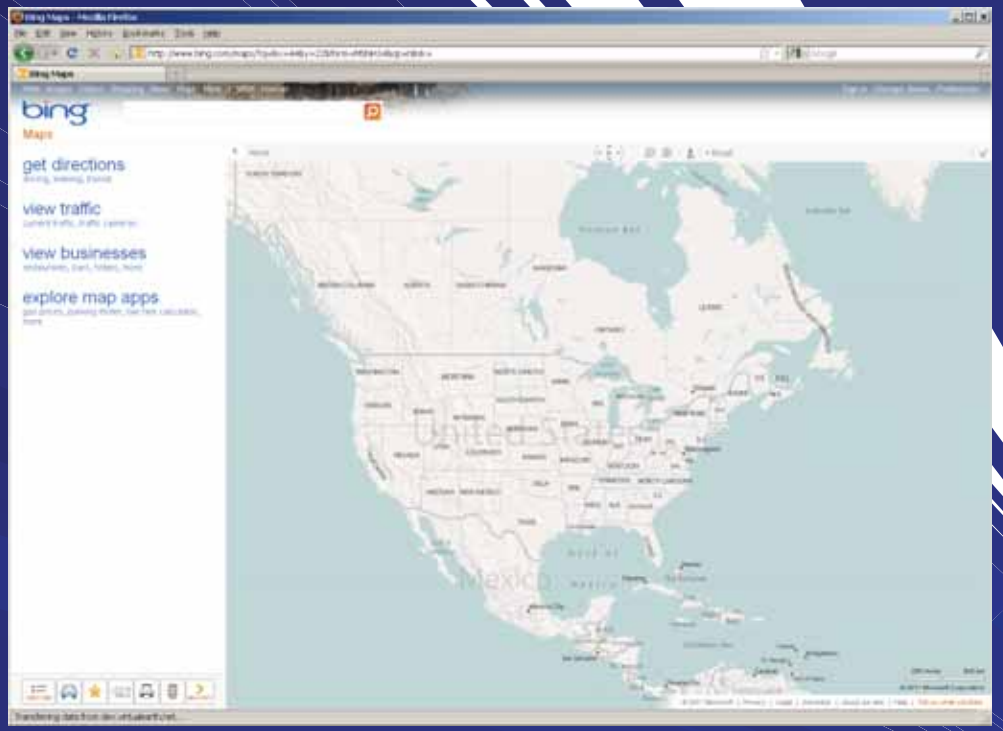
Bing Maps

Another basic online – get directions mapping service

Requires a MSN/Hotmail account

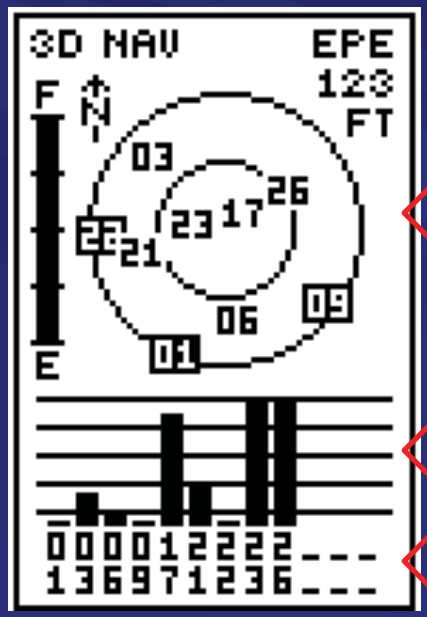
"Bird's – eye" perspective is a neat additional feature



http://www.bing.com/maps/?FORM=Z9LH9

GPS Data Capture & Download Basics

The longer you sit the more accurate the location (typically)



Satellite Constellation

Satellite Signal Strength

Satellite Number

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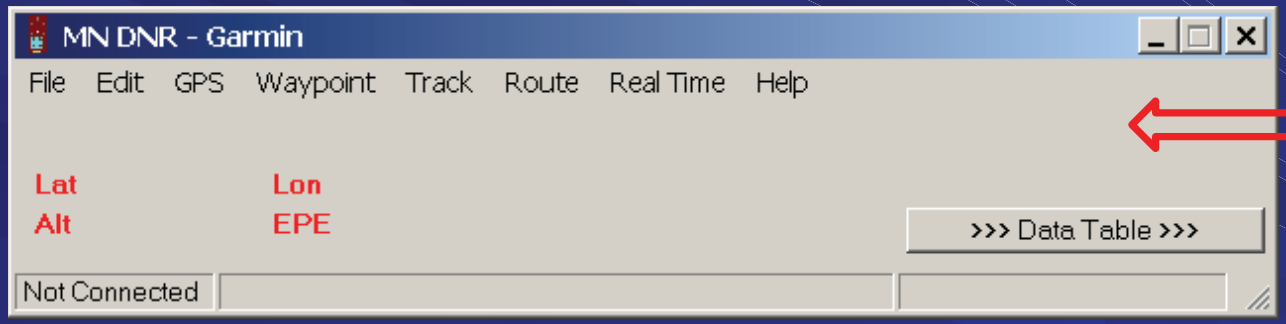
GPS Interface program

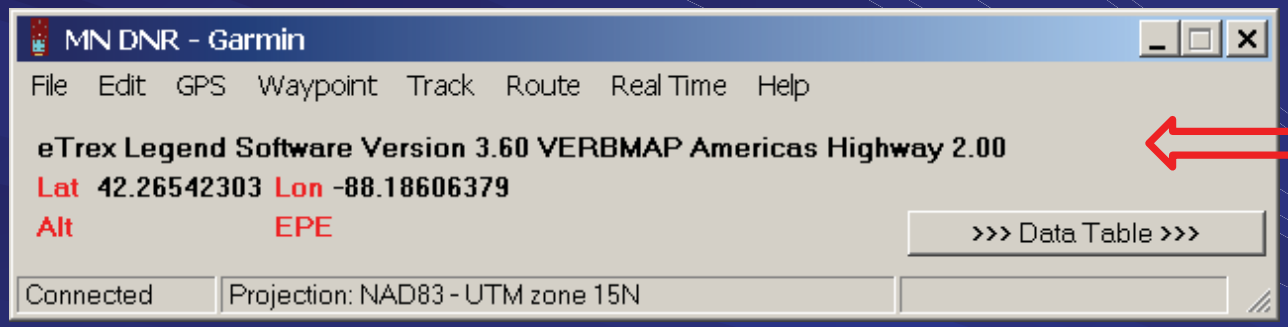
- I recommend one created by Minnesota DNR



Not connected

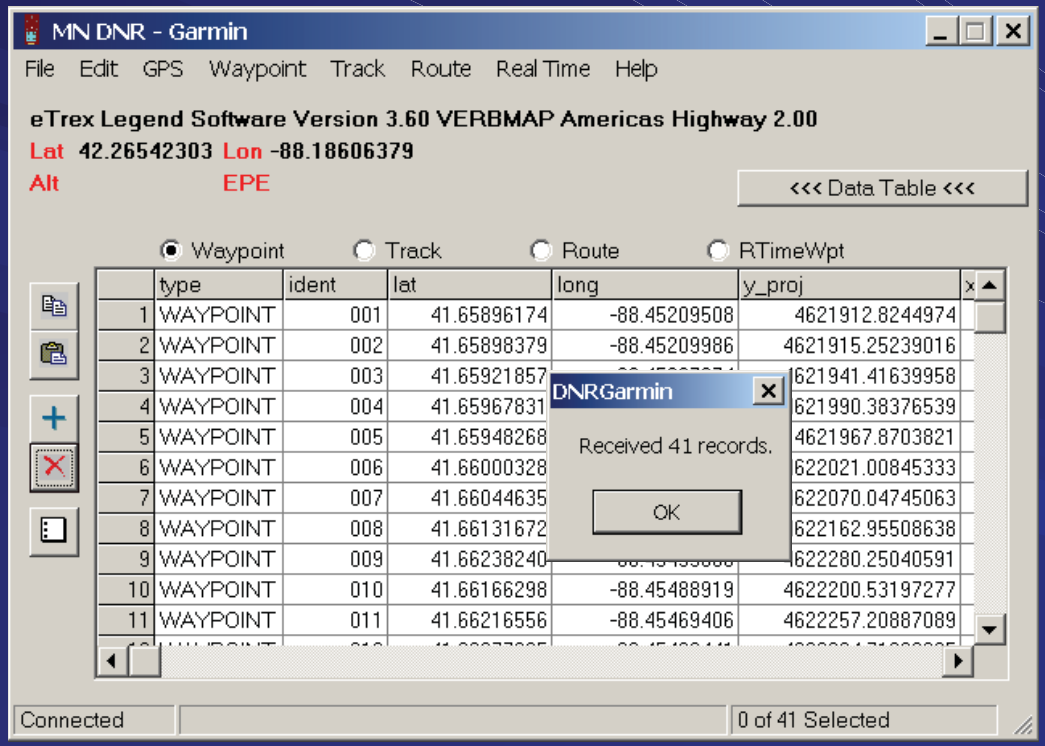
http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html

GPS Interface once plugged into Etrex



Connected

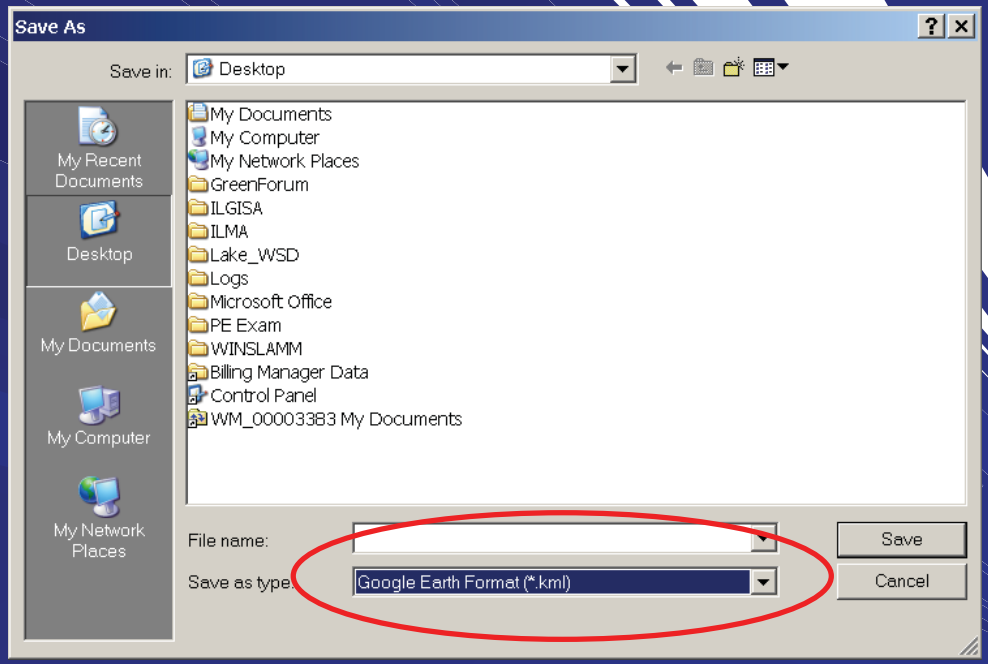
GPS Interface once plugged into Etrex



1. Navigate to "Waypoint Menu
2. Select "Download"
3. Wait for points to download

GPS Data Capture & Download Basics

- Menu → Save To → File
- Google Earth Format (*kml)
- Other options exist for more advanced users
- If Google Earth is on your computer, double clicking the KML will auto-launch Google Earth



BREAK

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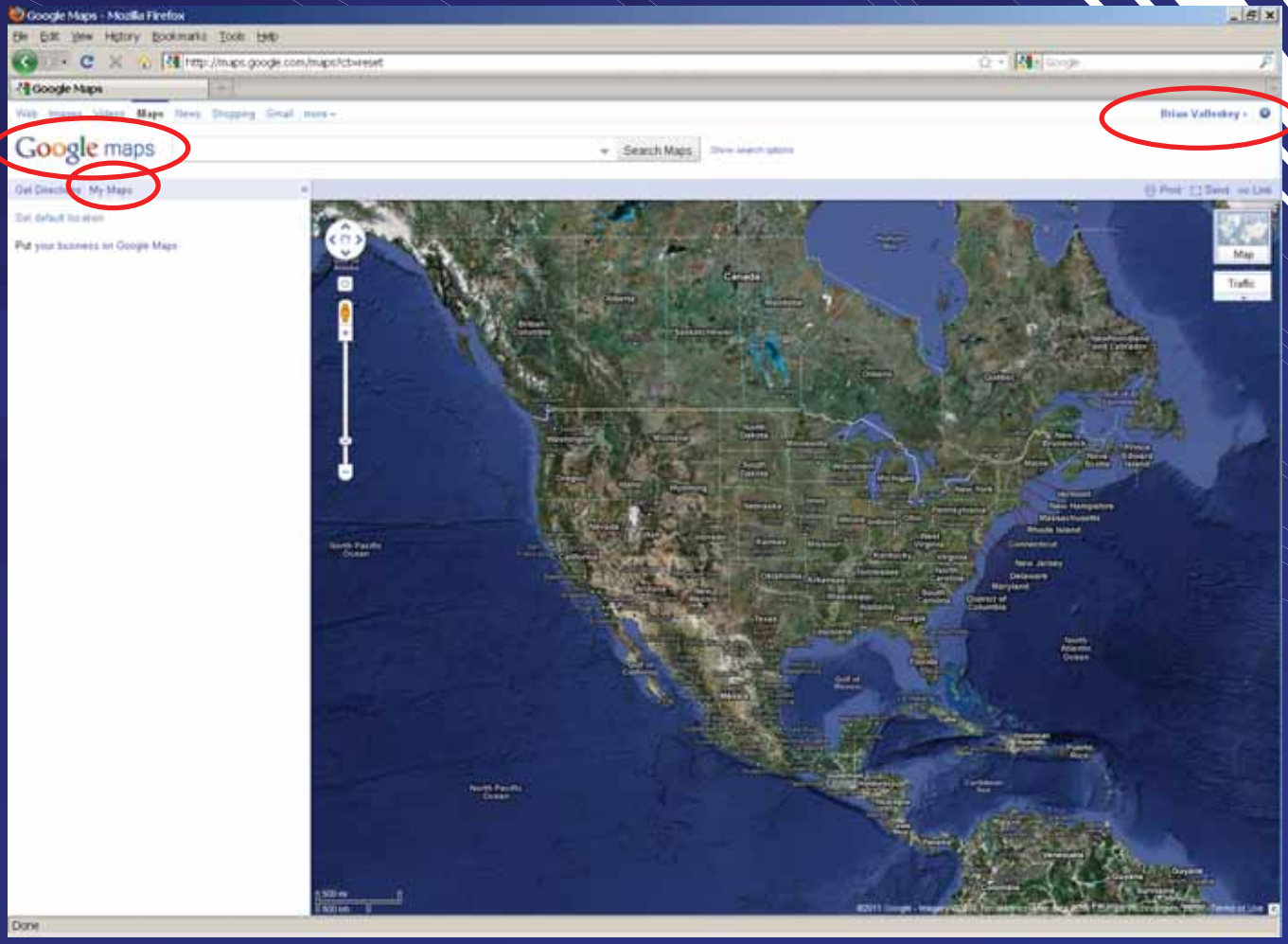
Real Example: VLMP Mapping



L
Click
My Map

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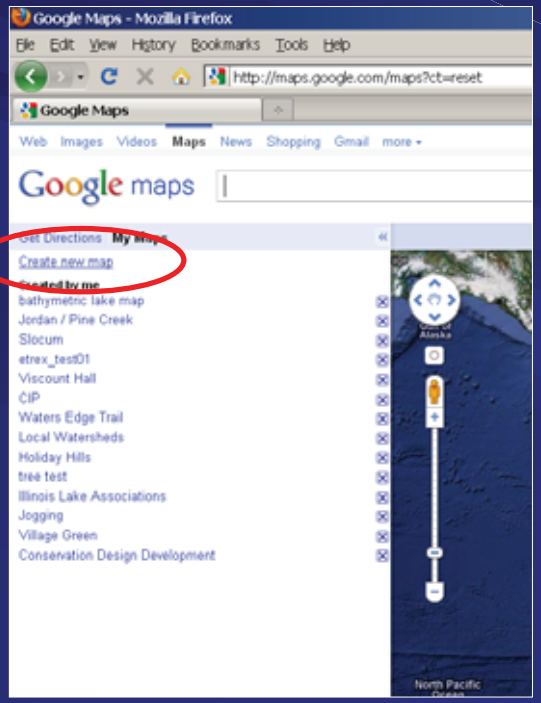
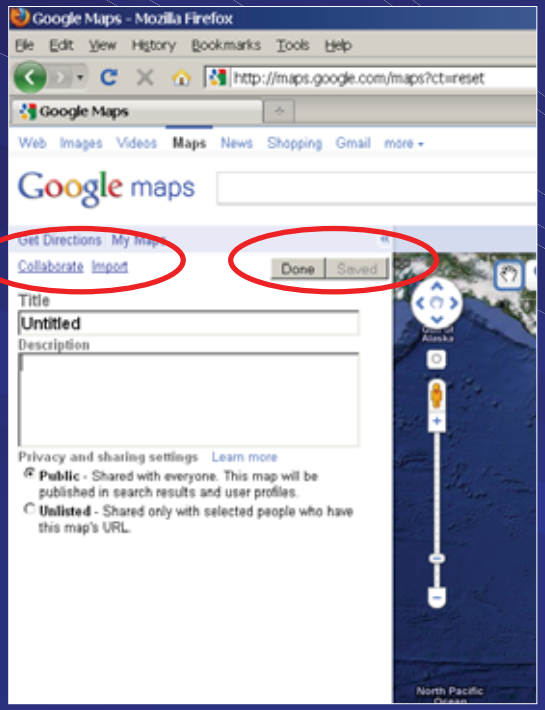
Define your map, description – note the additional items below My





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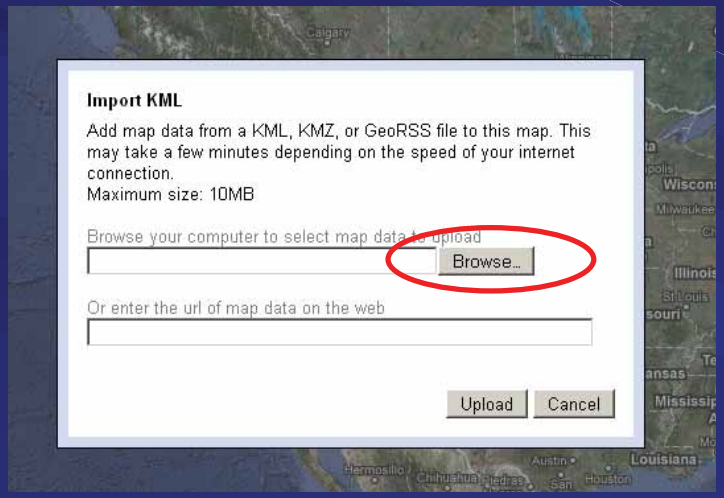
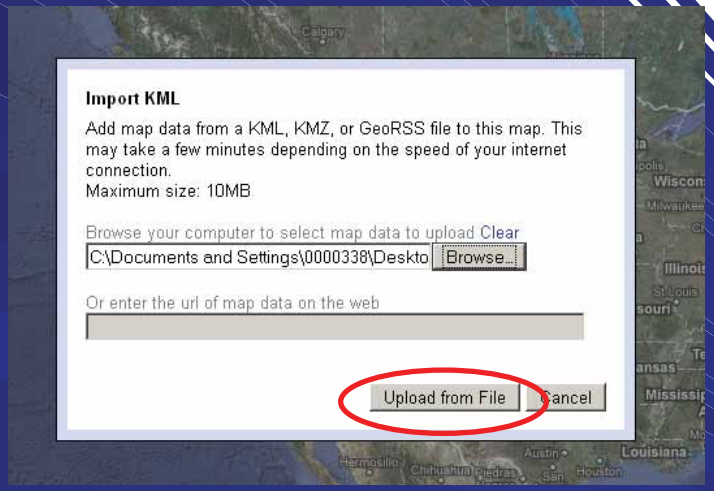
Navigate to .kml files stored on flash drive – Upload from File





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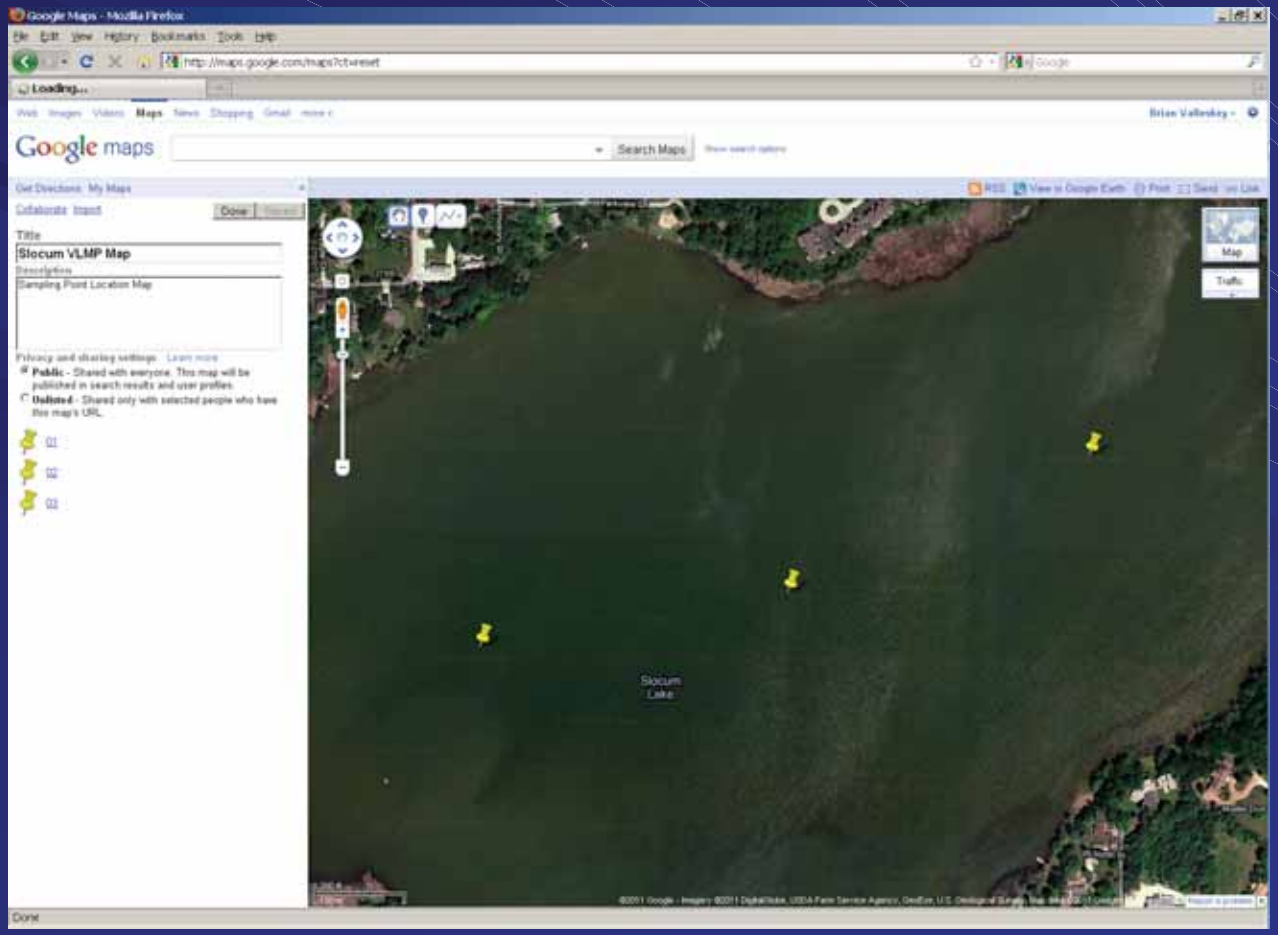
Will automatically Zoom to the range of your ma[illegible]p[illegible]s



1. Redefine[illegible]nts
2. Zoom in/out
3. Toggle Map/A[illegible]ri
4. Draw something
5. Save Map

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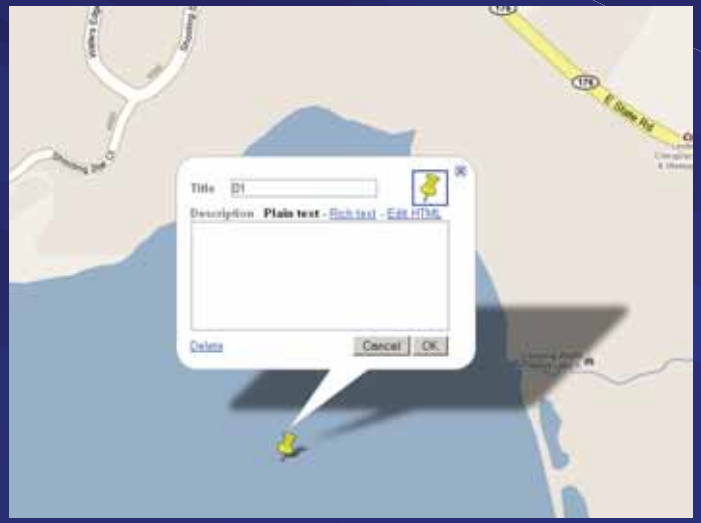
Toggle to “Earth” View, change symbol, add text

Redefine the remaining two points



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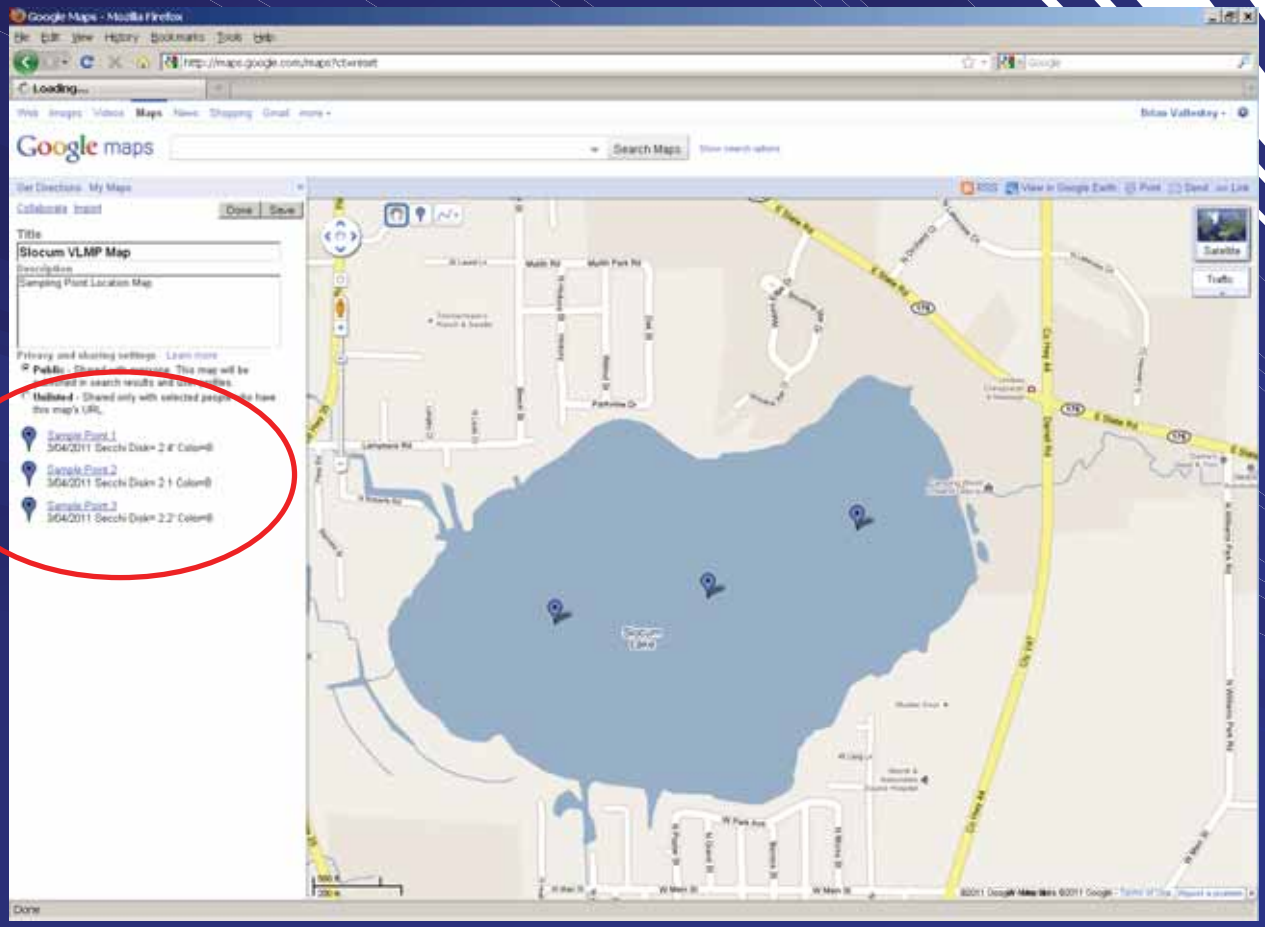

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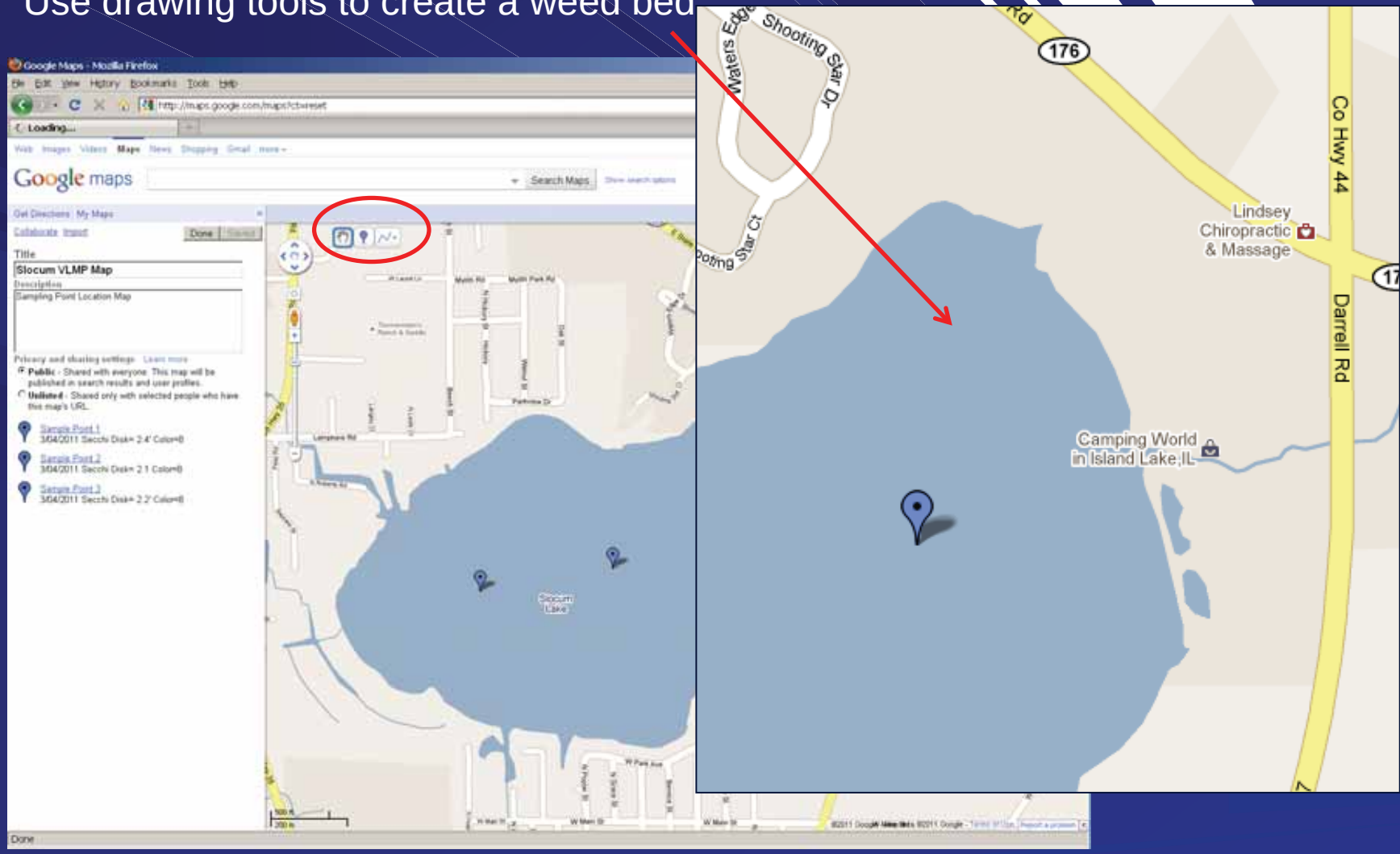
Use drawing tools to create a weed bed



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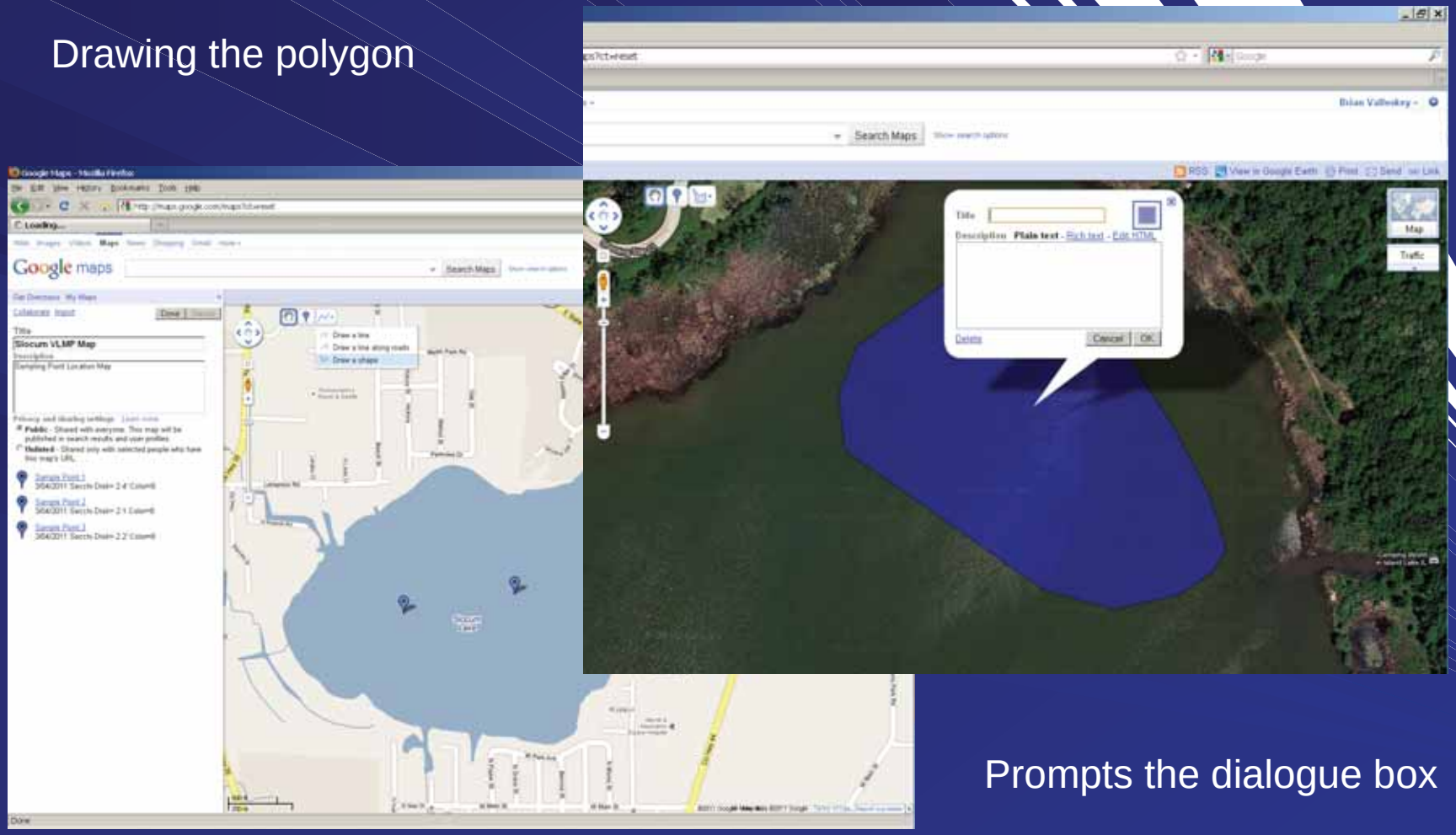
Drawing the polygon



Prompts the dialogue box

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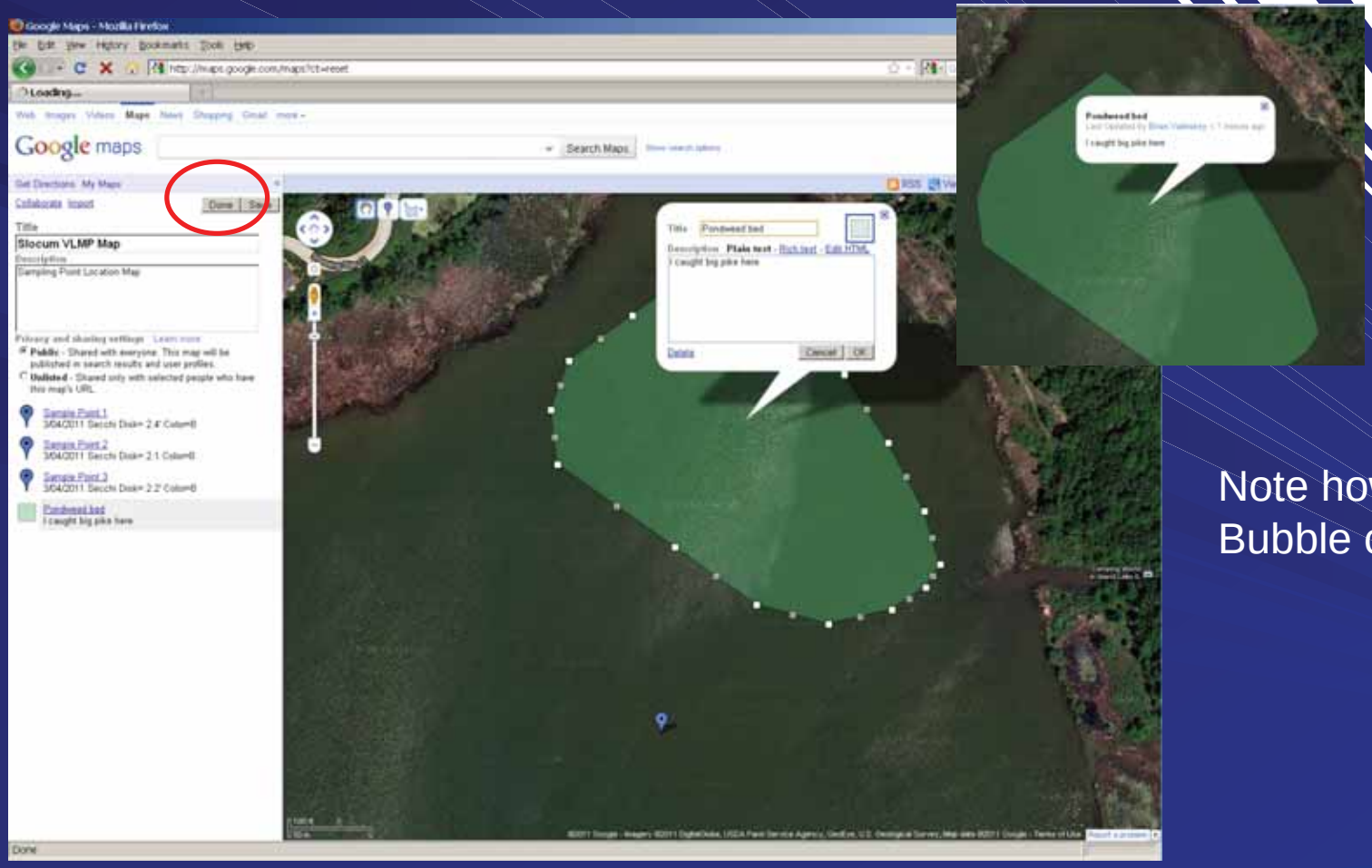
Click on “Done” to save your map, you can always make mo[illegible] ha[illegible]



Note how dialogue Bubble changes

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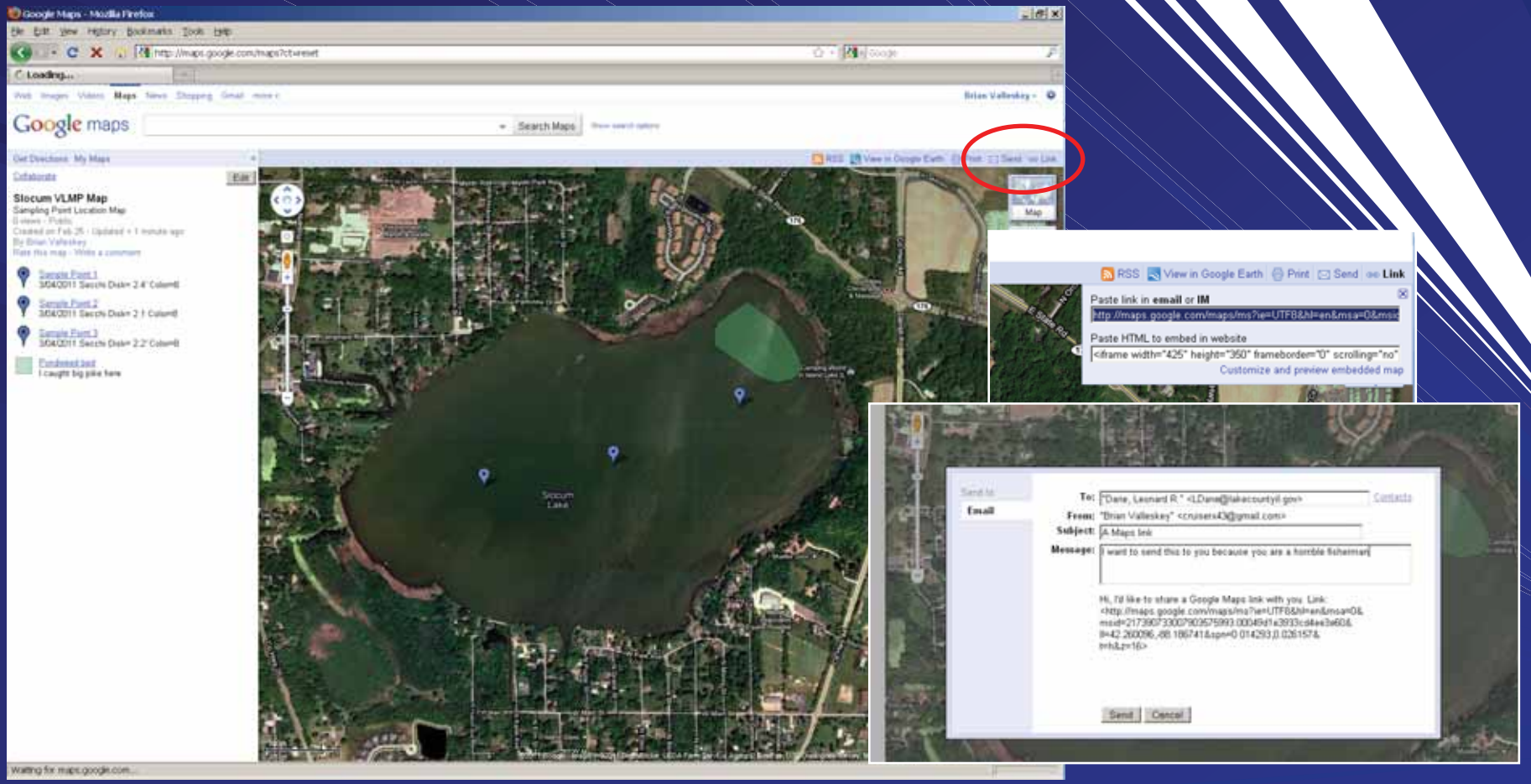
Email the Map using Link or Send



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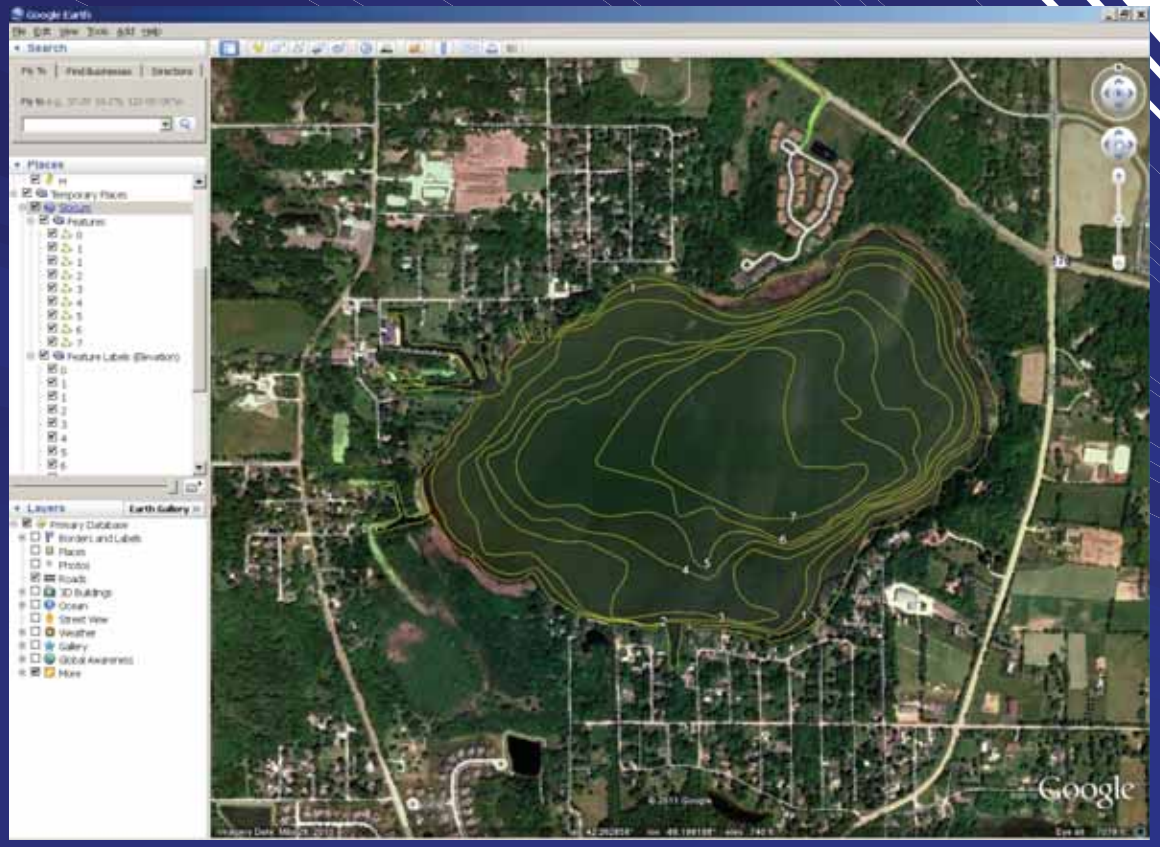
Example of converted GIS data imported into Google Earth



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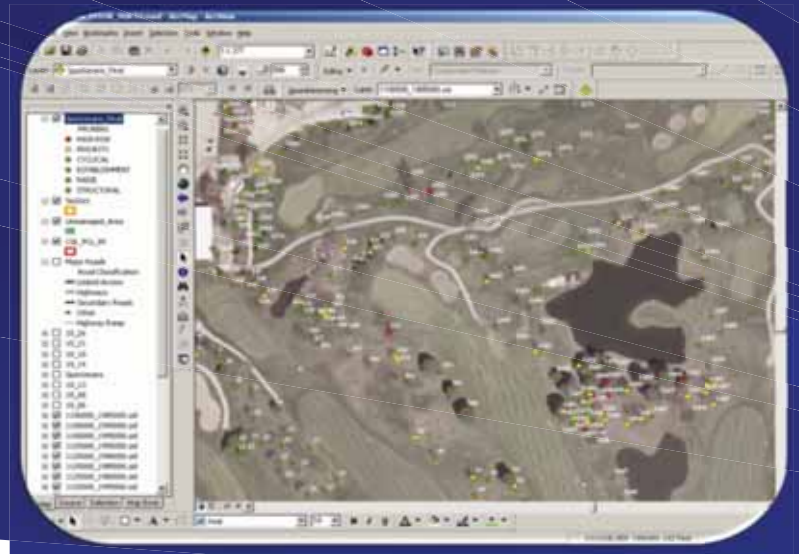

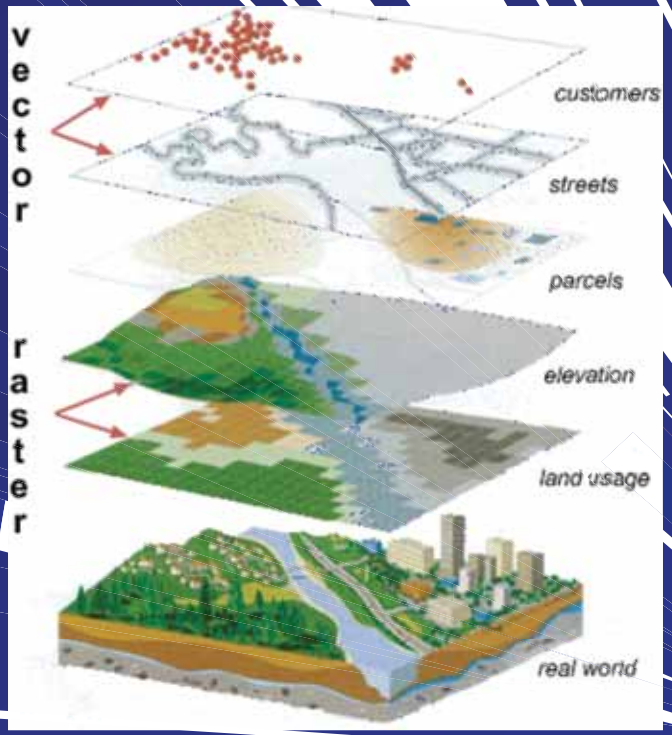

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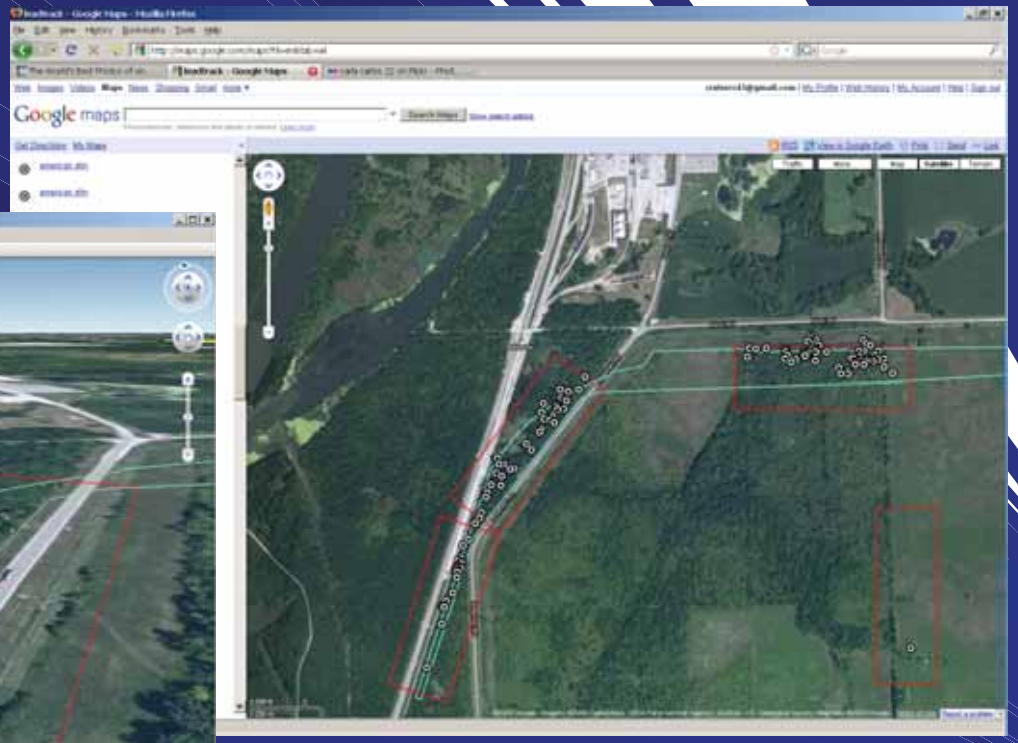
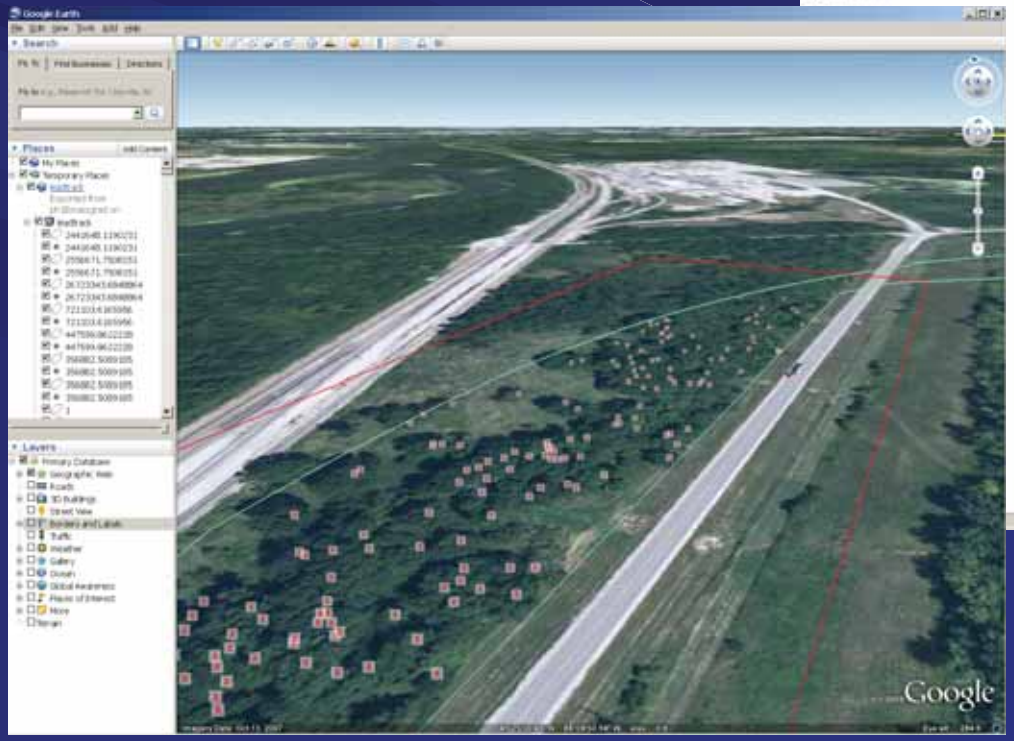
- Google Earth
- Google Maps





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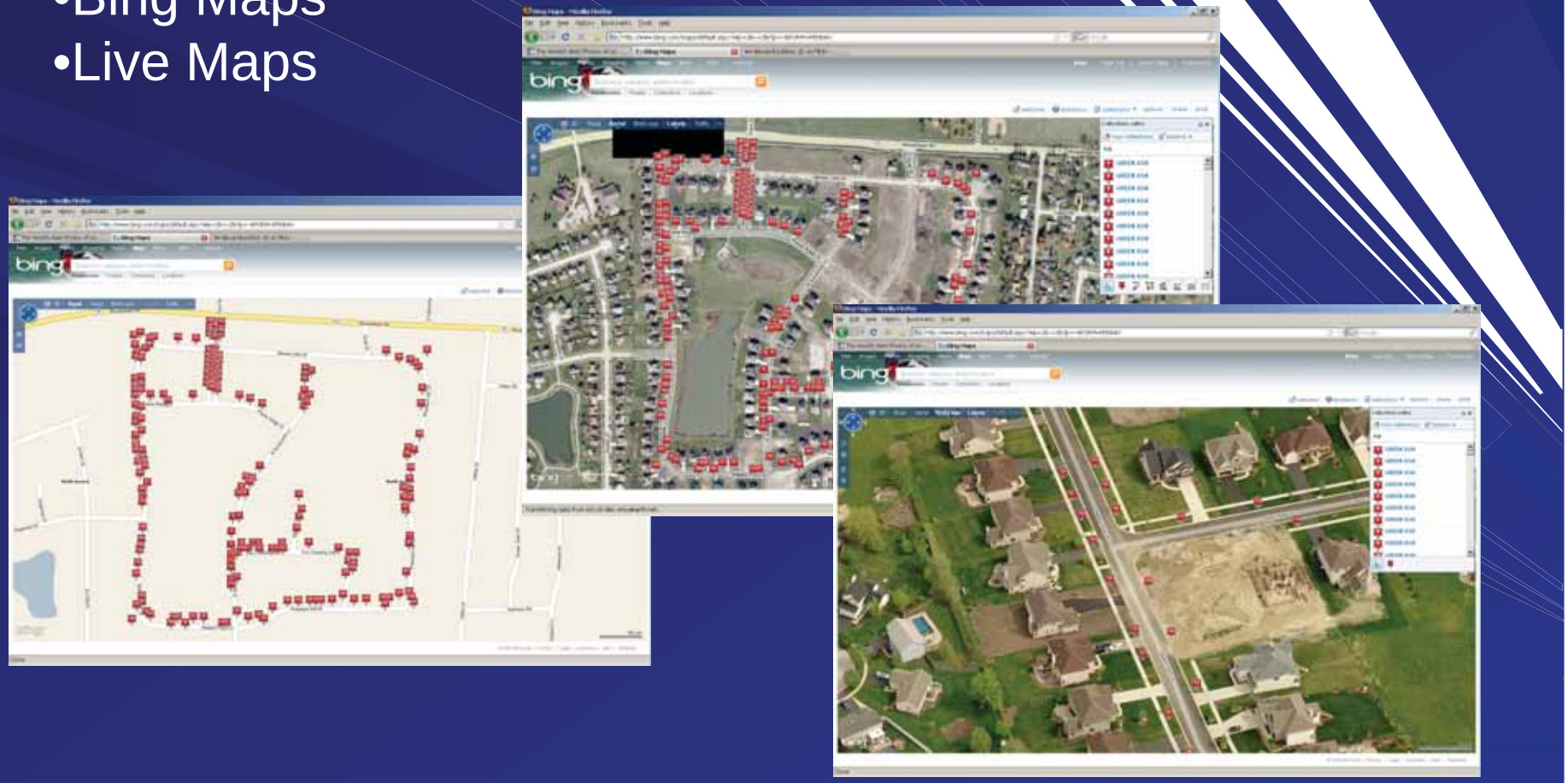
- Bing Maps
- Live Maps



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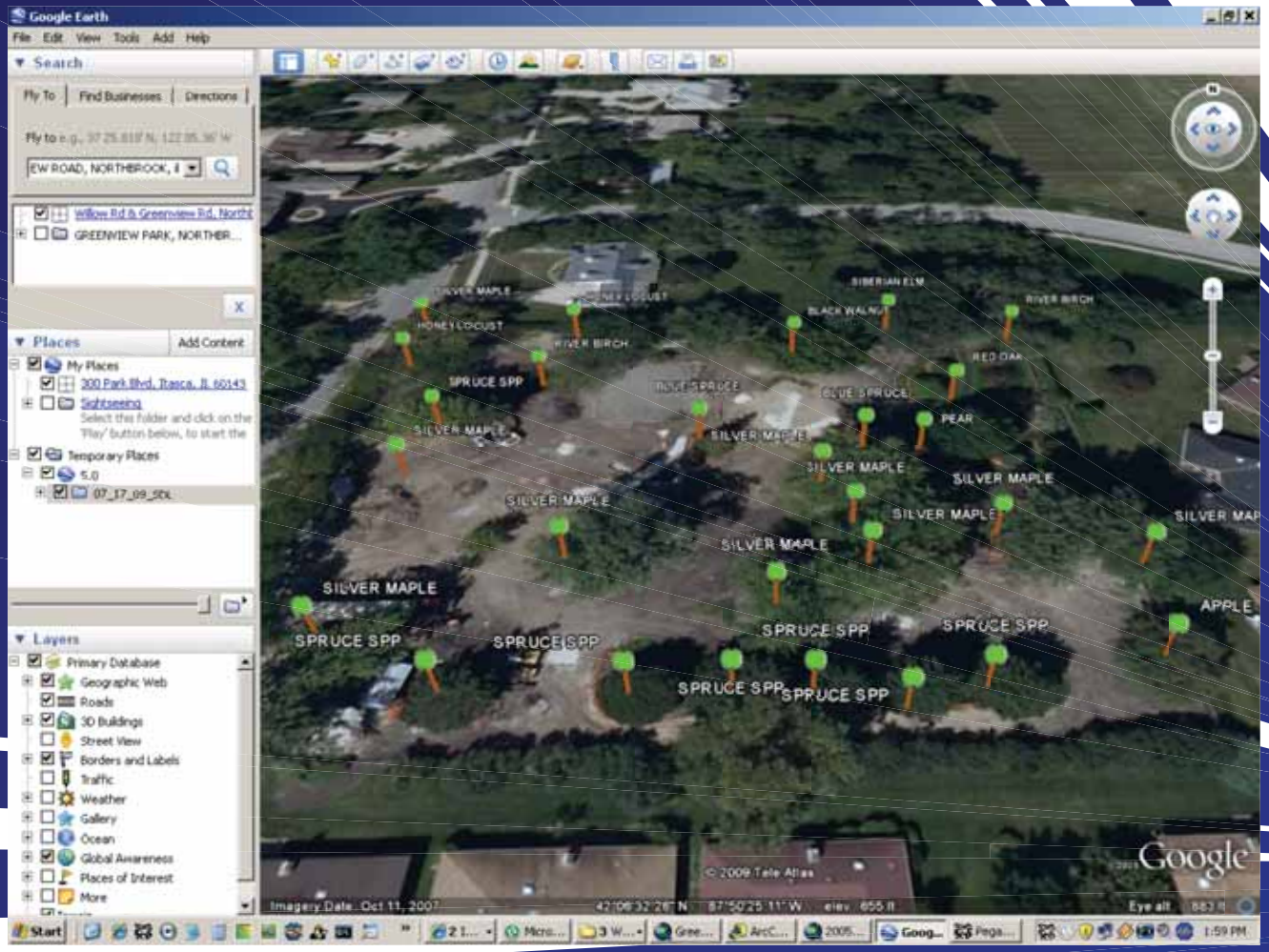

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QUESTIONS!

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