

# Online Mapping Primer

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<http://www.gisp.vt.edu>



Woods and Wildlife Conference  
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## Online Mapping Primer

- Geographic Viewers and Geographic Exploration Systems
- InFOREST
- Google Earth Pro

## Geographic Viewers/Exploration Systems

- Allow for exploration of spatial data
  - Base imagery and data are already collected
- Sharing of spatial information and files
  - KML/KMZ files can be created and shared
- Allows users to create maps
  - Print/download maps using built in templates
- Often free
  - Google Earth Pro is now freely available!

## InFOREST

- <http://inforest.frec.vt.edu/>
- Basemaps and imagery
- Area, location, and distance measurements
- Annotation
- Printable map templates
- GPS point tool
- Runs through website, no need to download

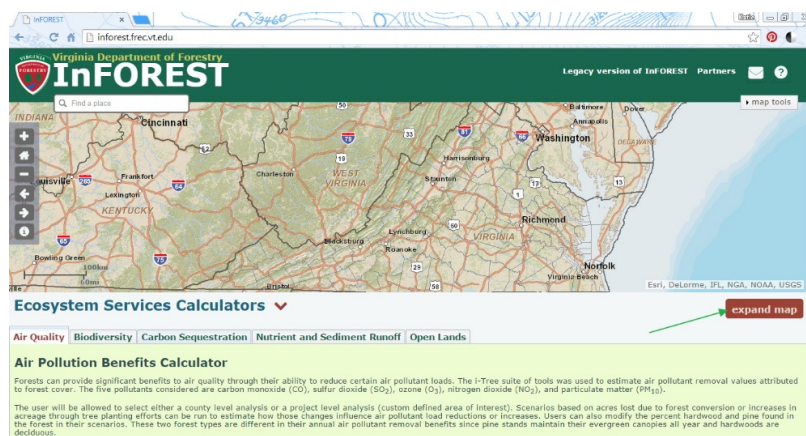
## Google Earth Pro

- Need to download and install program
- Basemaps and imagery available
- Measurement of location, distance, and now area
- Geocoding available
- Printable maps
- Use with KML, KMZ
- Can open shapefiles (.shp)
- New with Google Earth Pro: area function, demographic data, shapefile use, better quality printing, geocoding

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## InFOREST website

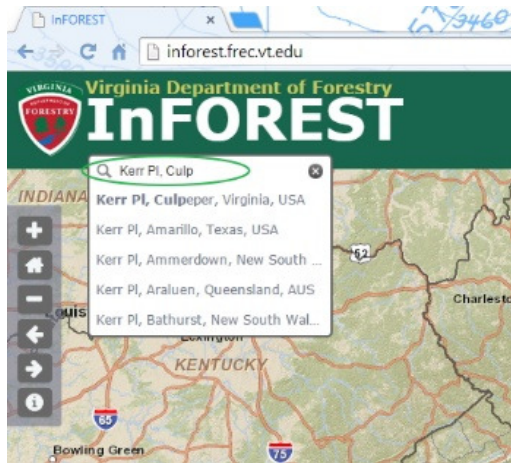


- Expand Map button
- Click to use full screen

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## Search for location

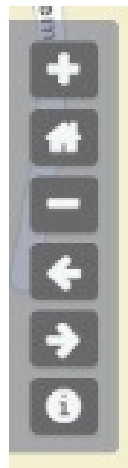


- Address
- Place
- Point of Interest
- Geographic coordinate
- For this exercise:
  - Kerr Pl, Culpepper, VA

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## Navigation of map in viewer

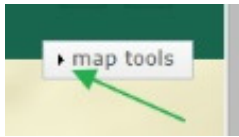


- Zoom in
- Go to home location (centered over Virginia)
- Zoom out
- Go back to last view
- Go forward to more recent view
- Information/help

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## Map tools menu

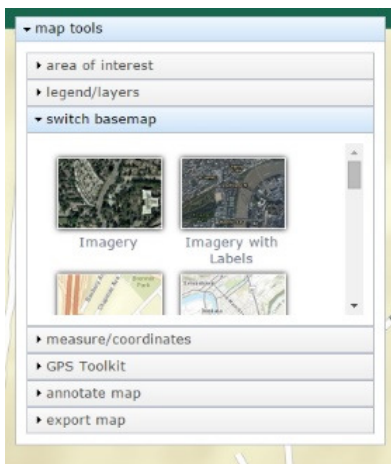


- Click on any “▶” to expand that menu option
- Click on any “▼” to minimize that open option
- Map tools allow for changes in layers and basemap, measurement, annotation, and map export

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## Change basemap to imagery

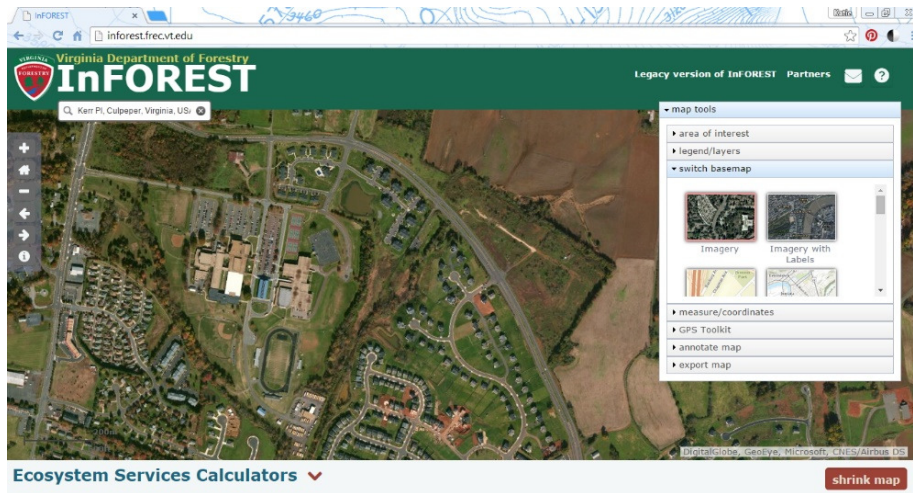


- Expand the “switch basemap” tool and select “Imagery”

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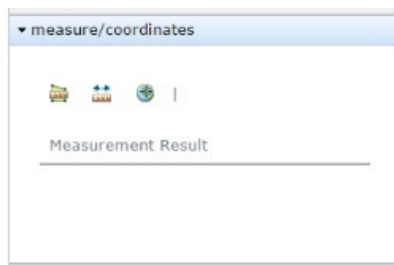
## InFOREST website with basemap imagery



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## Measurement tool

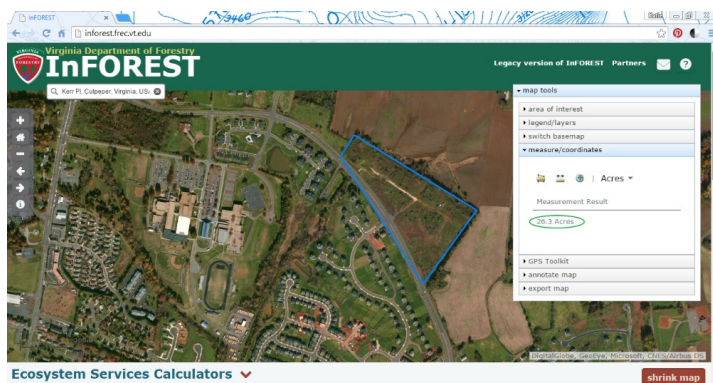


- Measure/coordinates has three options
- Measure area
- Measure distance
- Find point coordinates

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## Measurement tool: area

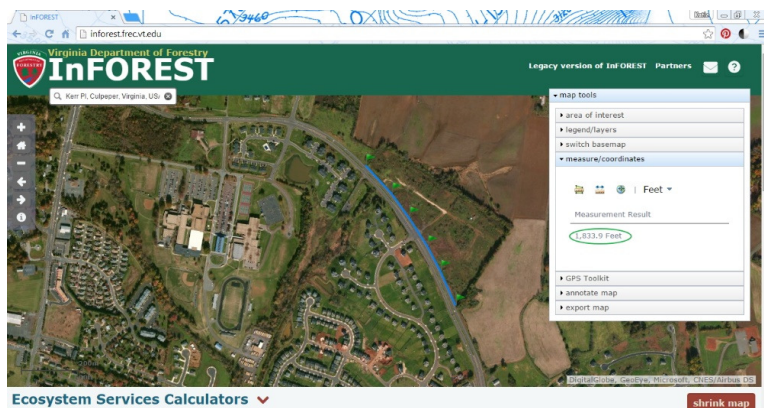


- Left-click around the outside of the area you want to measure
- InFOREST will attempt to “complete” the polygon as you go
- Double click when you are finished
- Display of measurement result in toolbox

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## Measurement tool: length

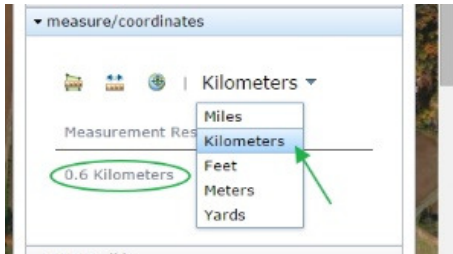


- Left click along the feature you want to measure
- Double click to finish segment
- Results located in toolbox
- Hint: use multiple-close-together points to follow a curve or other complicated feature edge

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## Change units for measured feature

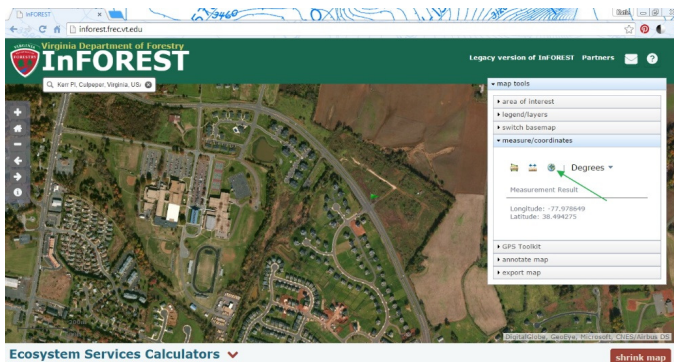


- Drop down allows for change in units
- Can change units after drawing feature (and without redrawing)
- Automatically updates measurement results

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## Measurement tool: coordinates



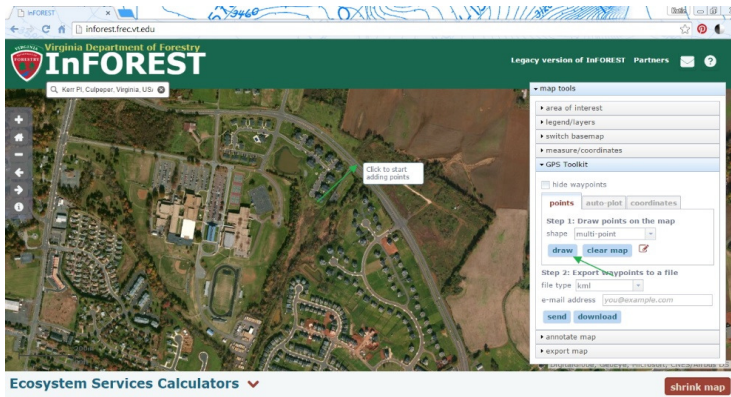
- Left-click on point to find coordinates
- Make sure coordinate button is “pressed down” before clicking

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## GPS Toolkit

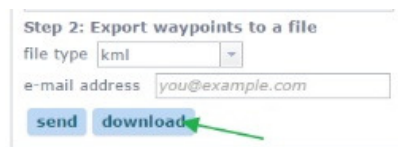
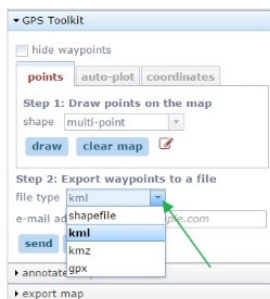


- Can
  - Manually draw Point/Multi-points
  - Auto-plot points in an area
  - Enter coordinates and it will plot points
- Use “Draw” button before starting to add points

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## GPS Toolkit: points



- Select point or multi-point from drop down menu
- Press draw button
- Draw points on map by left-clicking. Double click on last point.
- Clear points using “clear map” button
- Select a file type for exporting from the drop down menu
- Either send the file by email or download the file (in zipped format)

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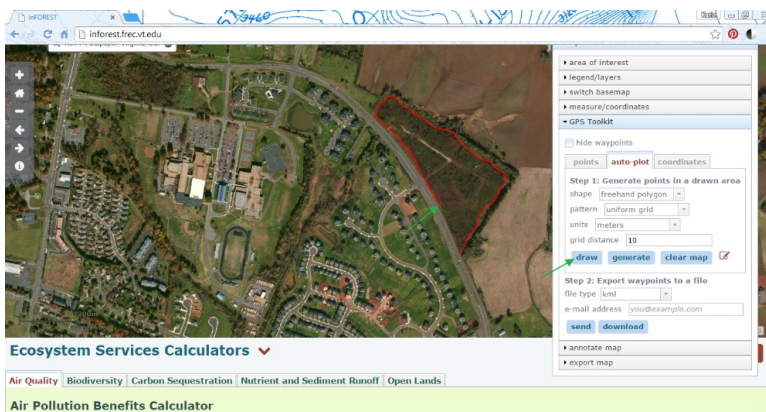
## GPS Toolkit: auto-plot

- Generate a set of points in an area
- Either freehand the area or click the vertices of the polygon
- Uniform grid or random points option
- Select options
- Draw shape
- Let InFOREST generate points
- Export point file for use

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## GPS Toolkit: auto-plot



- Select options
- Freehand with left mouse button held down
- InFOREST will automatically close shape when you release button

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## GPS Toolkit: auto-plot

hide waypoints

points auto-plot coordinates

Step 1: Generate points in a drawn area

shape freehand polygon

pattern uniform grid

units meters

grid distance 10

draw generate clear map

Step 2: Export waypoints to a file

file type kml

e-mail address you@example.com

send download

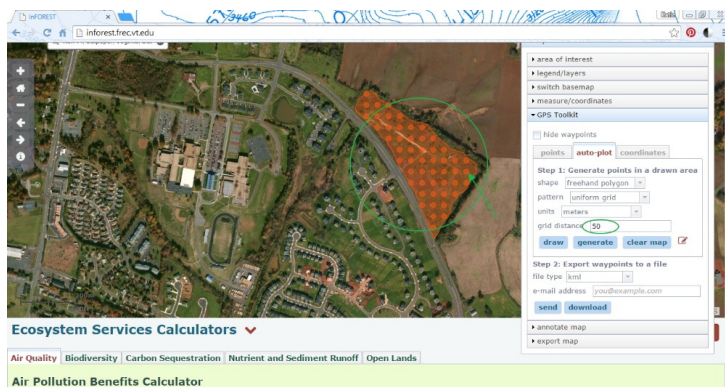
The job is being executed.

- With polygon drawn and options selected, click “generate”
- Then select how to export
- Tips:
  - Only 500 points can be generated in a polygon, so adjust the grid distance as necessary or use multiple polygons to cover the area
  - GPX functionality is currently being worked on

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## GPS Toolkit: auto-plot generation

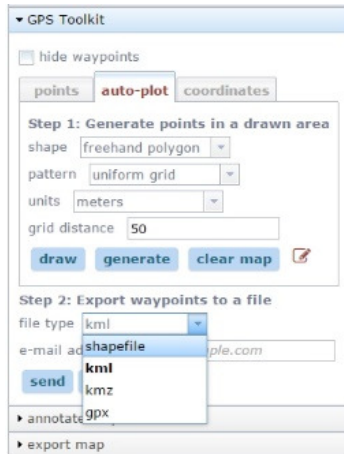


- Map display will update when generation is complete
- Here, the grid distance was updated to 50 to avoid having to many points and receiving an error message

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## Export auto-plot

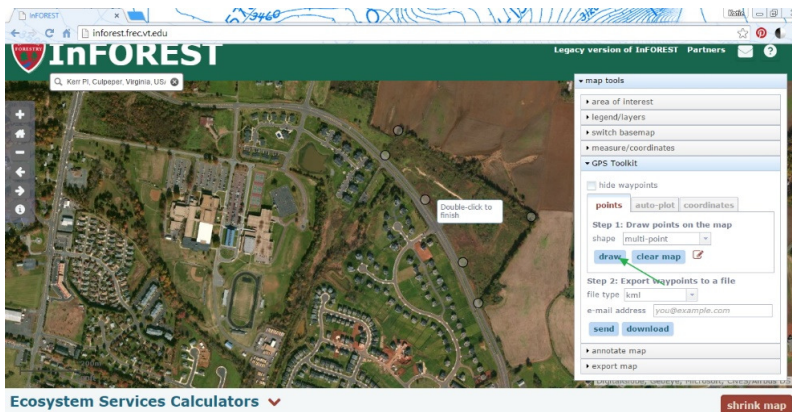


- Shapefiles, KMLs, and KMZs can be used in Google Earth Pro!
- Select to email or download the file
- File will be zipped

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## \*\*\*GPS Toolkit: points

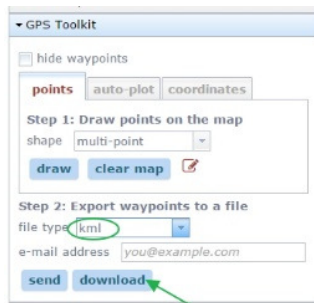


- Click "Draw"
- Draw points around the parcel seen on screen
- Double click to close polygon

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## \*\*\*Download KML file

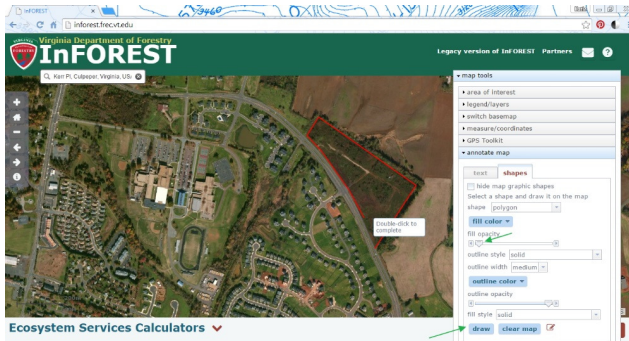


- Select KML from the drop down menu
- Download the file

## \*\*\*Download .shp

- Select .shp from the drop down menu
- Download the file
  
- Take both the KML and the .shp and unzip the files for future use
  
- Be aware that shapefiles have multiple file components... keep them all in a file together to be safe!

## Annotate Map: shapes

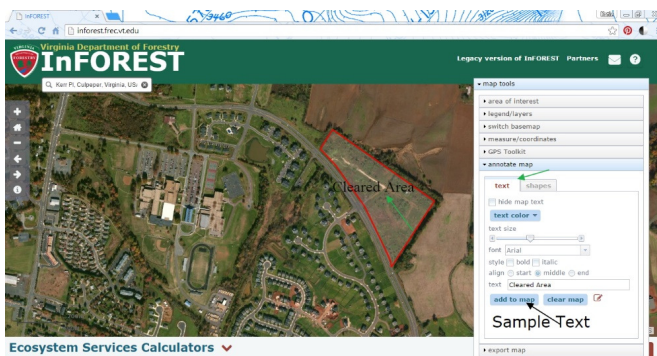


- Select options for shape
  - Shape type (freehand vs vertices, multi point/segment vs individual)
  - Fill and line color
  - Fill and line translucence/opacity
- After selecting options, select “draw” and left click around feature, double clicking to close polygon or end line

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## Annotate Map: text



- Select options for text
- Type text in “text” box
- Preview text
- Add to map at point

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## Export map

▼ export map

title

notes

file type

layout

scalebar units

- Input title, notes about map
- Select file type (pdf, jpg etc)
- Select page size and layout
- Select scalebar units
- Select “print”

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## Sample InFOREST printed map

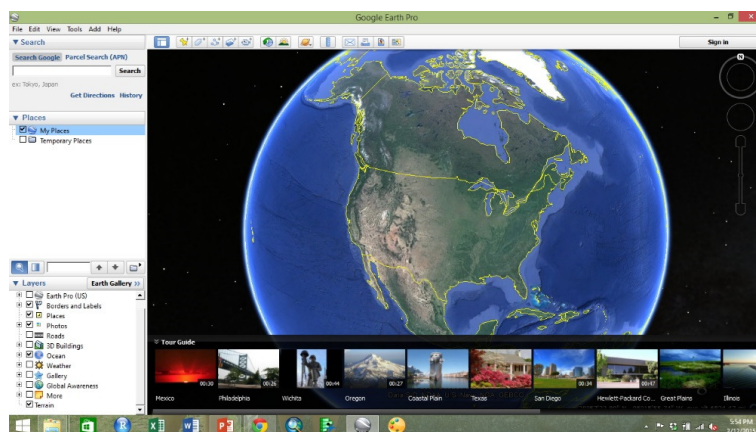


- Retains annotations
- Gives information about imagery sources

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## Google Earth Pro

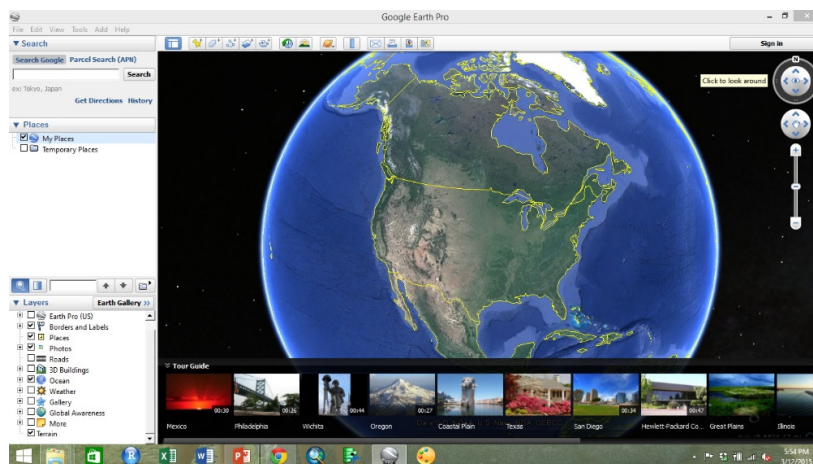


- Opening screen
- Can hide the “Tour Guide” to get more map space (click the down arrows along the tour ribbon)

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## Navigation



- Hover over the navigation tools on the left to make them visible
- Double click in map to zoom in
- Drag map to move view

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## Navigation Tool



- Drag or hold down the left mouse button in the top circle to change the orientation from North
- Double click the “N” to return to normal
- Lower circle: click or drag to move map content
- Zoom in or out by dragging the marker or clicking the “+” or “-”

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## Search for locations

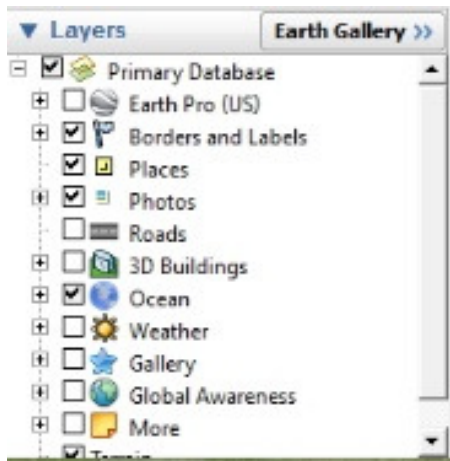


- The Search tool is located in the top left of Google Earth Pro
- Search points of interest, places, addresses, or latitude/longitude
- Parcel number (APN: Assessor Parcel Number) is also available

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## Layers

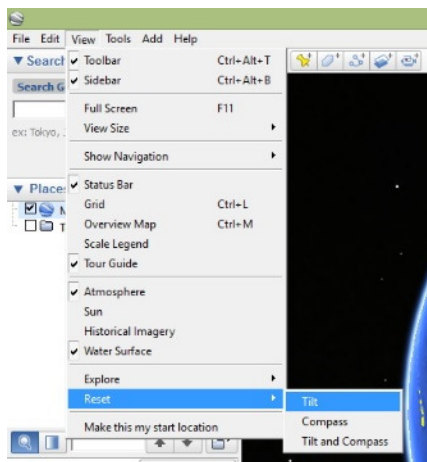


- The layers tool is in the lower left hand corner of Google Earth Pro
- Check or uncheck layers and labels you are interested in
- Some layers have sub layers: expand by clicking the “+”
- Google Earth Pro has more advanced layers than Google Earth. Expand the “Earth Pro” layer set to view demographic, parcel, and traffic data

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## Reset map view



- If you zoom in too far, accidentally change the settings, or view certain layer features, the view can become “tilted”
- To reset the map view to north at the top of the screen and no tilt in the imagery view
  - Click the “View” menu
  - Go to “Reset”
  - Click “Tilt and Compass”

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## Common tools

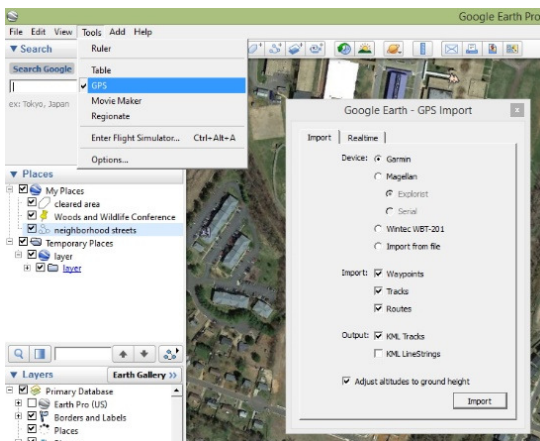


- Add Placemark
- Add Polygon
- Add Path
- Add Image Overlay
- Record a Tour
  
- Show Historical Imagery
- Show Sunlight

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## GPS Tool

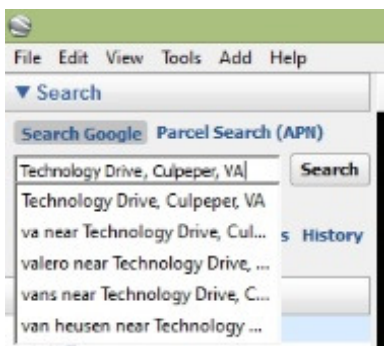


- You can import GPS files
  - Go to the “Tools” menu
  - Click “GPS”
  - Select settings and import in tool interface
- Imports points from unit, unlike InFOREST where you can create a file to load into the unit

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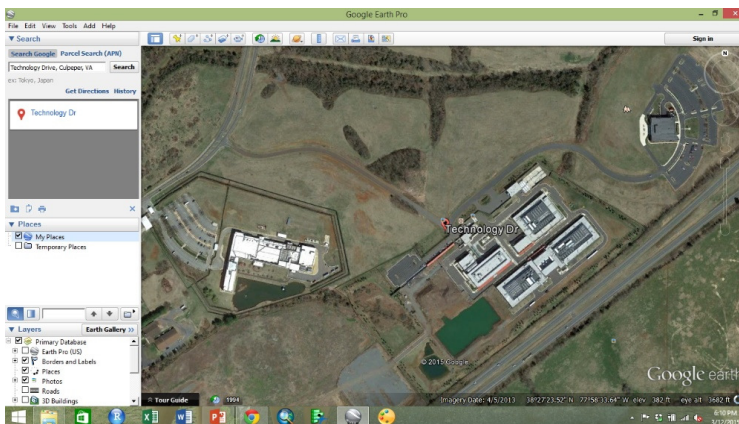
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## Search for conference location



- In the search tool, enter
  - “Technology Drive, Culpeper, VA”
- The tool will autocomplete to suggest locations as you type

## Woods and Wildlife Conference



- You can adjust layers to include those of interest
- Zoom in or out to preference
- Click the red placemark at Technology Drive

## Point information



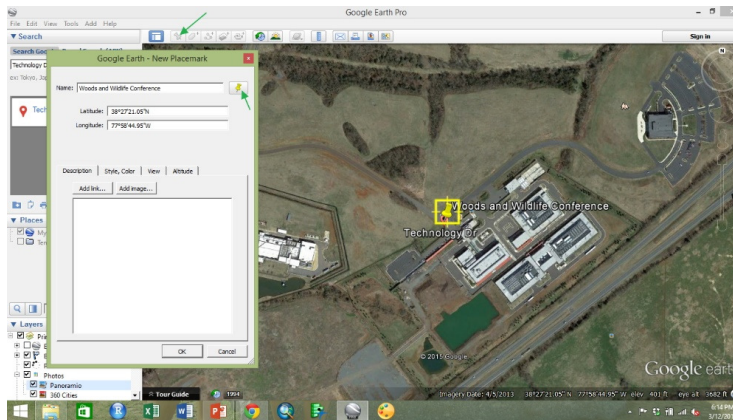
- If you click a symbol on the map, an information bubble will appear
- Close by clicking the “X” in the top right of the bubble

## Other layer symbols



- Click the photo symbol for user uploaded pictures of features of interest
- Click other layer symbols for additional information
- Useful for exploration of sites of interest

## Add a placemark

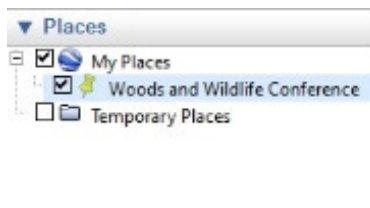


- Click the “add placemark” tool
- Drag the symbol to the correct location
- Add information and a title
- Change the symbol

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## My Places

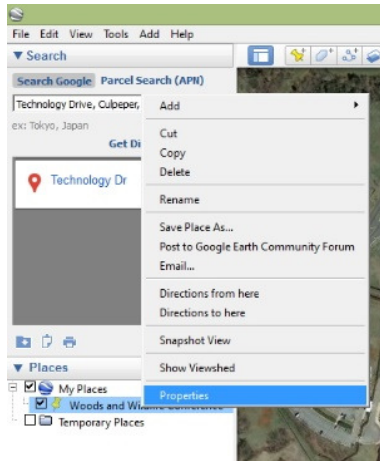


- “Places” are located in the left sidebar
- When you create a place or shape, it will appear in the folder that was highlighted

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## Edit placemark

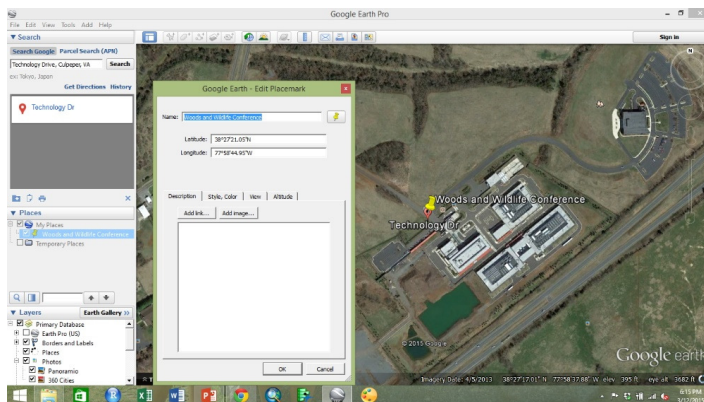


- Right-click the placemark in the “Places” sidebar
- Go to “Properties”

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## Edit Placemark

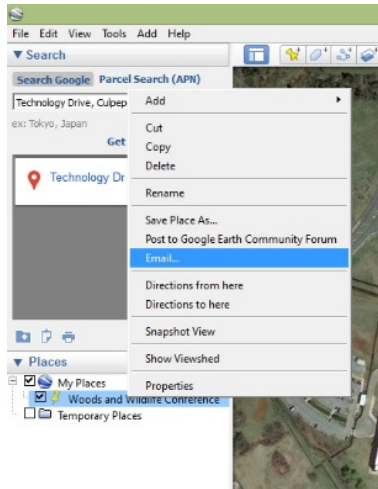


- Change the location of the pin by dragging it on the map with this tool open
- Change the symbol
- Add information or pictures
- Change the view or zoom level
- Click “Ok” to save changes

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## Place options

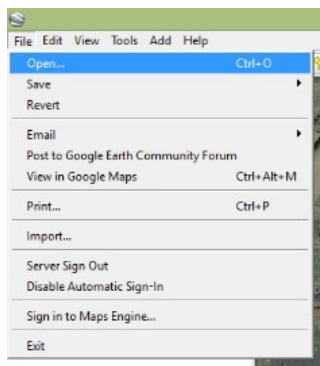


- Right-click a place in “Places” to view options
- Get directions to or from a place
- Email a place

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## Open an existing KML or KMZ



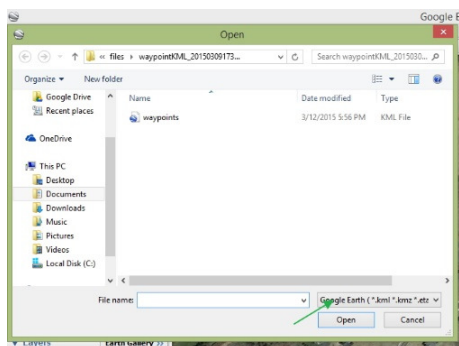
- Open the KML we created in InFOREST
- Go to “File”
- Select “Open”

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## Open a KML

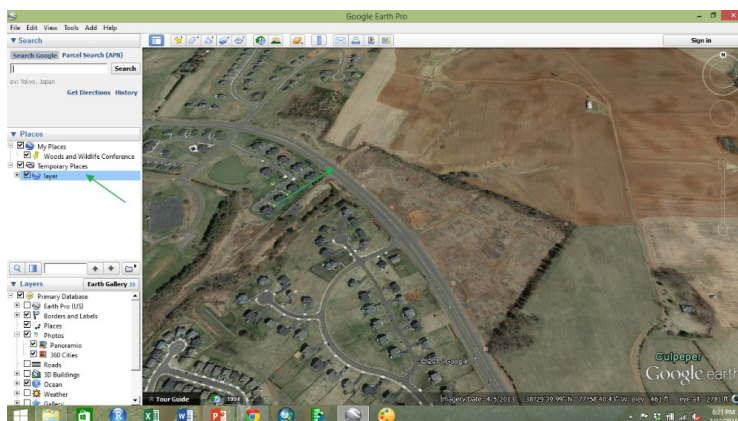


- The “Open” window will appear
- Navigate to the location of the saved KML
- Select the Google Earth file type
- Select the file
- Click “Open”

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## Opened KML

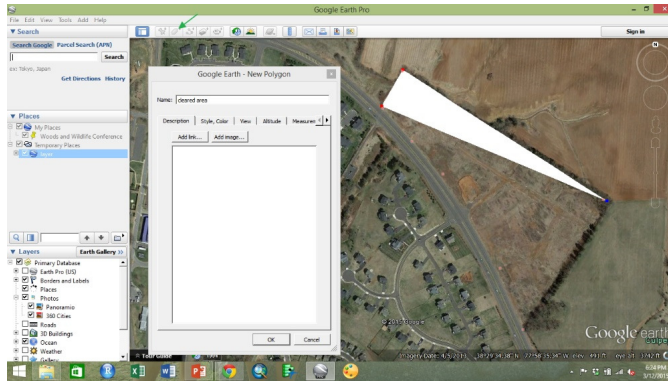


- The map will open, pan to, and show the KML selected
- Notice which Place folder the file is in
- Add a placemark here

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## Add a polygon

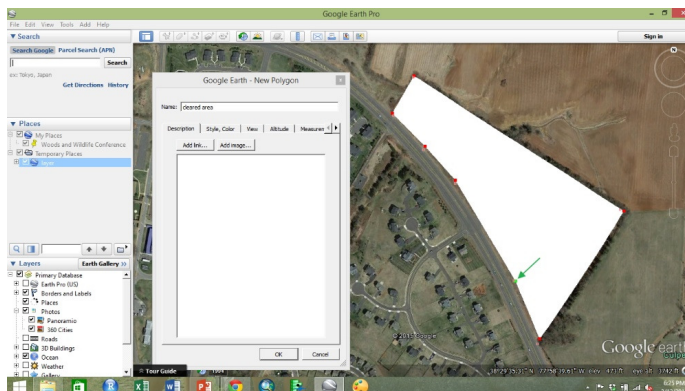


- Select the “add a polygon” tool
- The attributes menu is similar to the placemark menu
- Left-click around the polygon
- Google Earth Pro will attempt to “close” the polygon as you go
- Click “OK” to finish

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## Edit polygon vertices

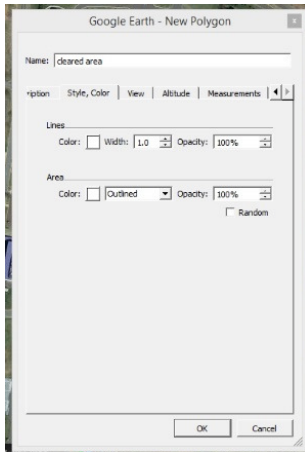


- To edit vertices, click the vertex you are interested in moving
- Drag the vertex to the desired location or click a new location
- You can do this while creating or editing a polygon
- You can also select a vertex and use the “delete” key to remove it
- Right click to remove the highlighted vertex

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## Polygon style

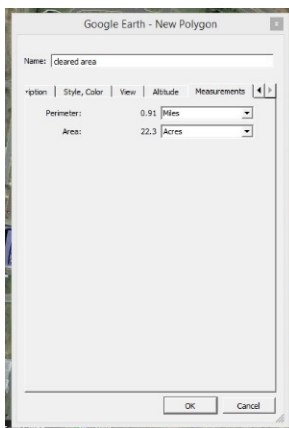


- Select line color, line width, and line opacity
- Select fill color, style, and opacity

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## Measurement tab in polygon

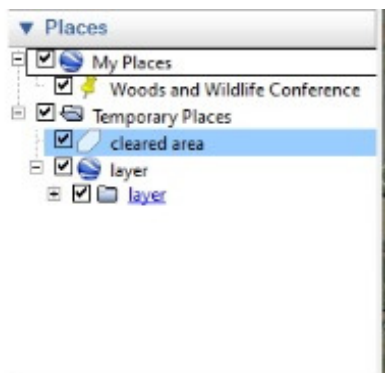


- Select the measurement tab in the polygon properties menu
- Google Earth Pro offers the ability to measure area!
- Use the drop down menu to change units of measure

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## Place Folders

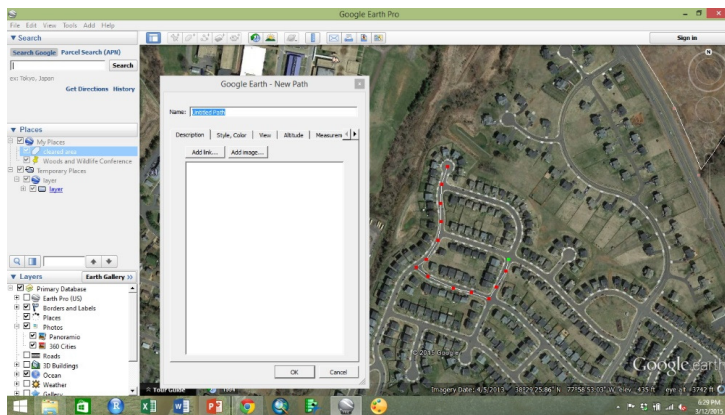


- Left click and drag a place to a different folder to sort or make permanent
- Right-click “My Places,” select “Add,” then “Folder” to create new folders to sort and save your places

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## Add a path



- Left-click along the path you wish to create
- The most current vertex will be highlighted
- You can select previous vertices and edit them by dragging them
- If you wish to add a point in the middle of the path, select a vertex that will be before the point you want to add, then click where the new vertex will be located

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## Path tabs

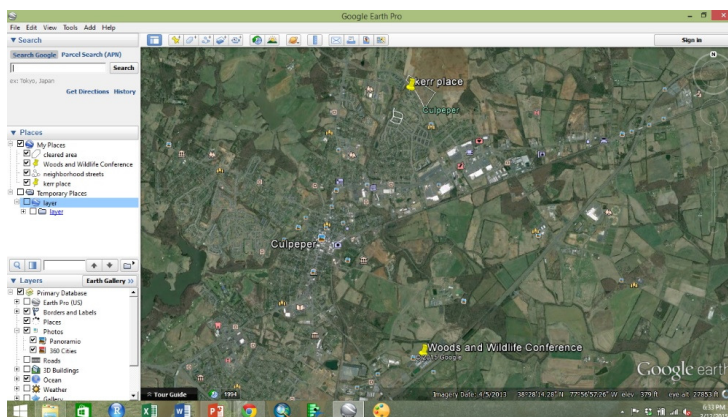


- Select the measurement tab
- The path length will be given
- Use the drop down menu to change unit
- Select the “Style, color” tab to change the path style. Similar to the style options for polygons.

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## Zoom out

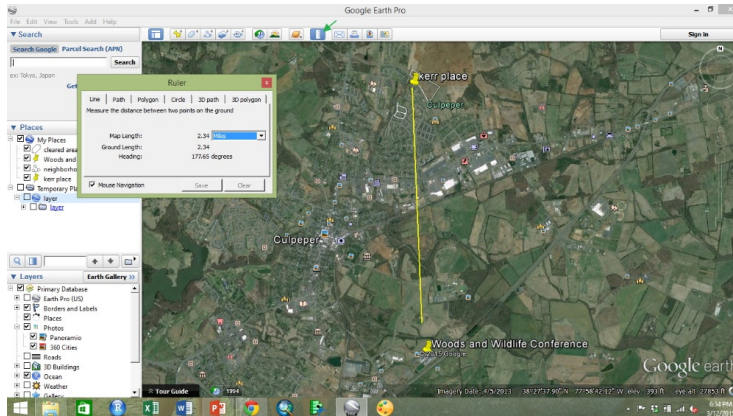


- Zoom out so the polygon, path, and Woods and Wildlife Conference placemark are all within view

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## Ruler tool

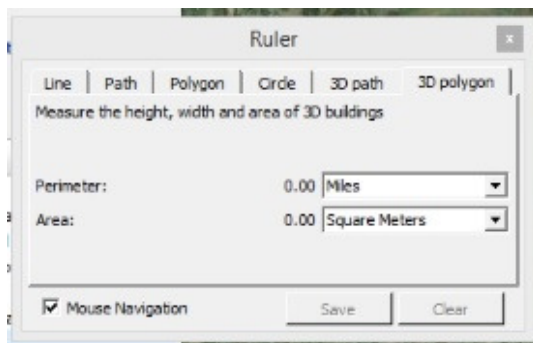


- Select the “ruler” tool from the top row of tool icons
- Select the “line” tab
- Click the Kerr Place location and measure the line to the conference placemark
- Use the drop down menu to select units of measure

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## Other Ruler options

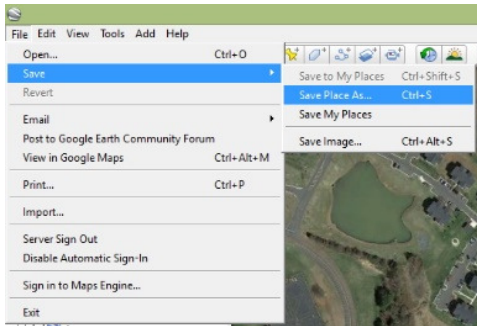


- Use “Line” for as the crow flies
- Use “Path” to measure a path with multiple vertices
- Use “Polygon” for area and perimeter
- Use “Circle” and click the middle of the circle and the radius
- Use “3D path” and “3D polygon” for measurements that take topography into account

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## Save Places

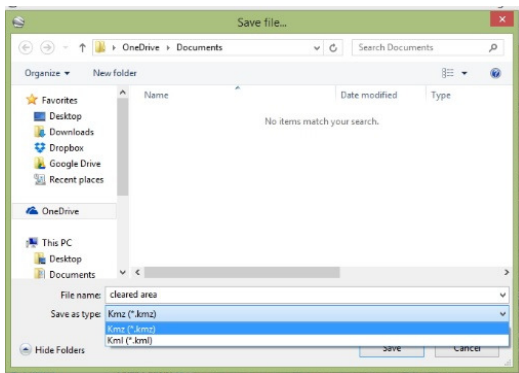


- Select the “File” menu
- Click “Save”
  - Save Place As: save the highlighted place
  - Save My Places: saves your work so you can use it in another session

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## Save Place As

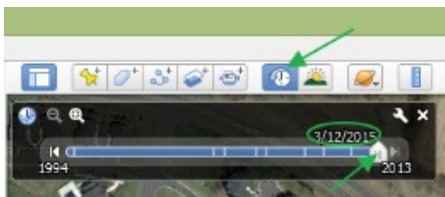


- Save the selected place
  - Select the folder to save in
  - Give the place a file name
  - Select the file type (KML or KMZ)

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## Historical Imagery tool

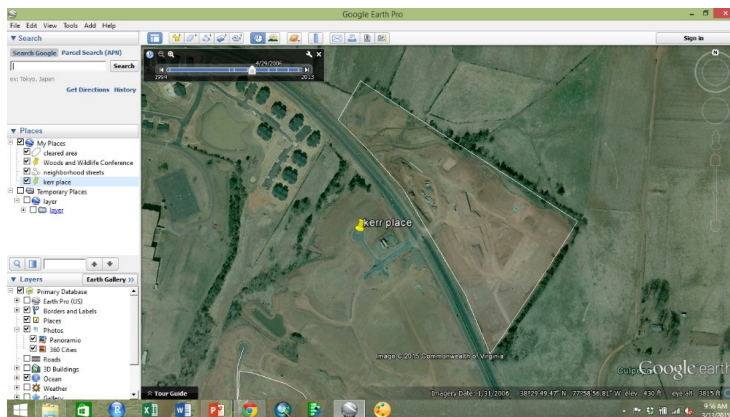


- Select the “Historical Imagery” tool
- The tool will appear in the upper left corner of the map
- The date of the viewer’s imagery is shown
- Slide the marker or click the rewind or fast forward buttons to view different dates

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## Land Cover Change



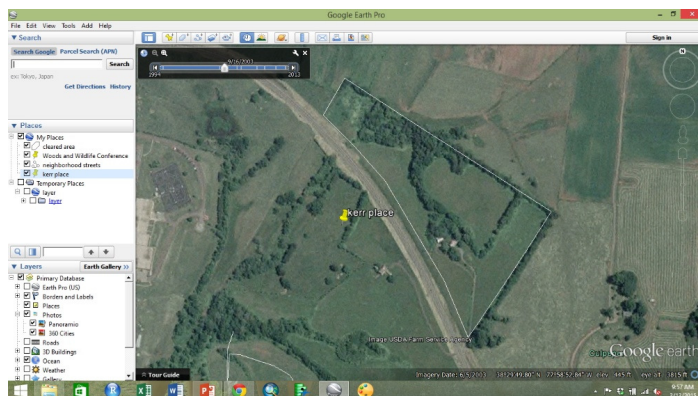
- Double click the polygon you created in “my places”

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## Land Cover Change

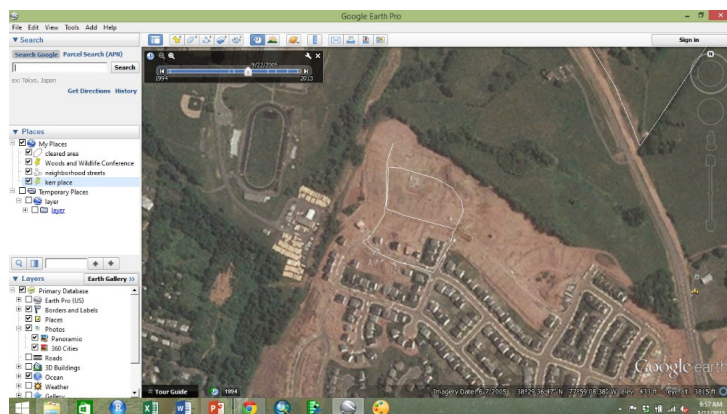


- Press the rewind button on the historical imagery tool to go back until you see the area before it was cleared
- Check the date of the imager

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## Land Cover Change



- Go to the neighborhood roads you created a path for
- See when they were built

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## Historical Imagery uses

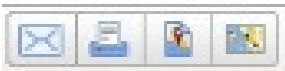


- Land use change/dates
- Leaf on/leaf off imagery to distinguish evergreen/deciduous
- Differentiate between pine/hardwood areas with imagery dates (digitize by creating polygons)
- Google Earth imagery only goes back so far
- Dates available are limited
  - May not capture changes between dates

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## Tools

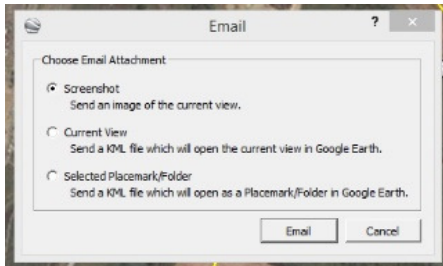


- Email
- Print
- Save Image
- View In Google Maps

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## Email Map

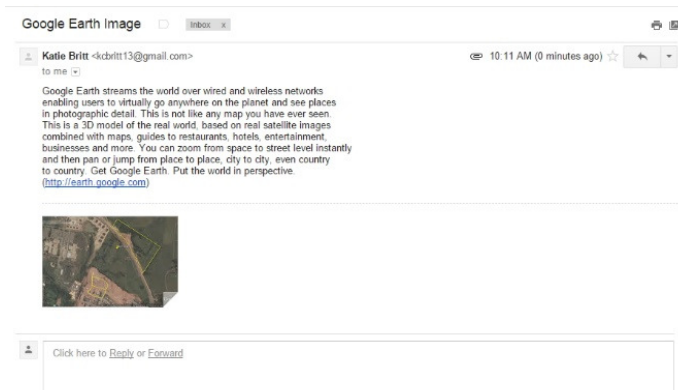


- Attach a .jpg screen shot of the current view in an email
- Send a KML file that will open the current view as an attachment
- Send a KML of the selected places
- Will need to sign in to your email account to use this option
- Can personalize the message and select recipients

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## Emailed: current screen shot

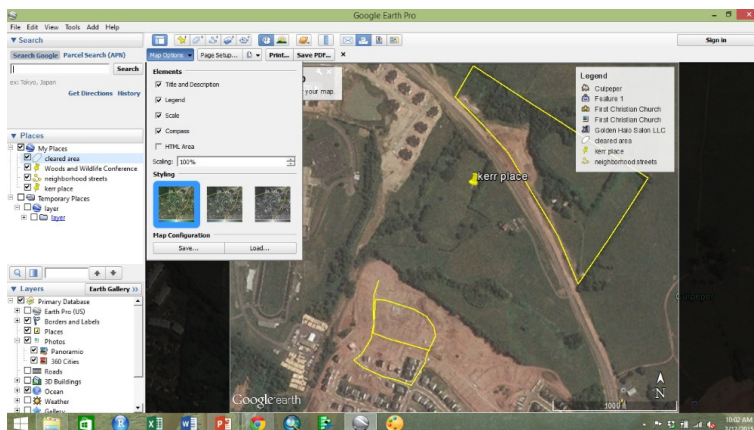


- Automatic text option for email
- Attachment is a .jpg

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## Print Map

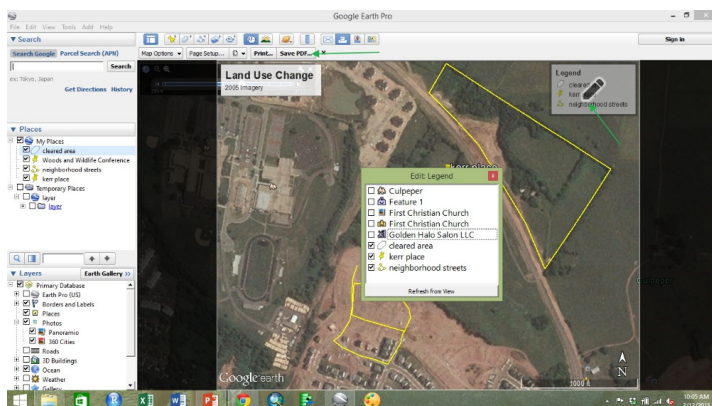


- Drag map view to preference
- Select map options, page set up, and print options
- Select to send to a printer or save as a PDF

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## Edit map elements



- Hover over the title or legend and click when the pencil appears
- Check elements that you want to appear in the legend
- Change the title and notes for the map

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## Printed Map

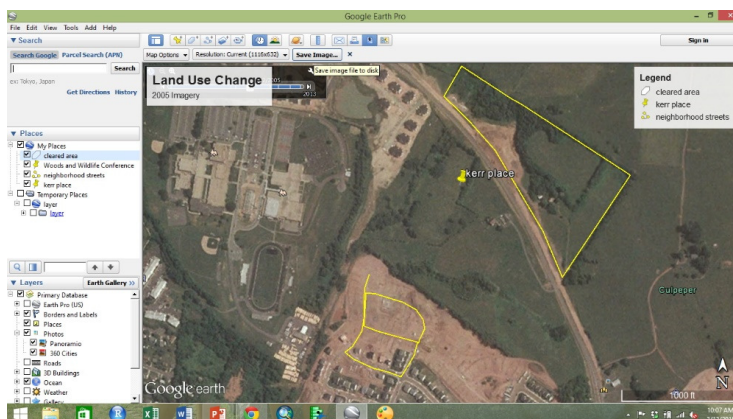


- The PDF or printed version will look the same
- If using pdf, you will be asked where to save the file and what to title it
- Notice the white space around the map

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## Save Image



- Edit the same way you edited the map for "print map"

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## Saved Image

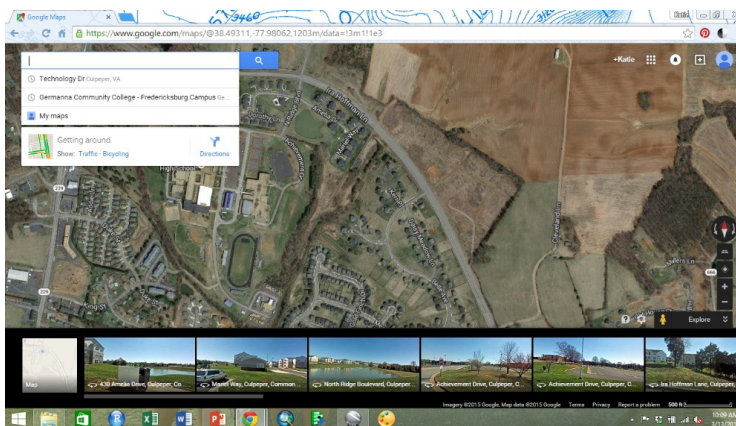


- You will be prompted to select a file location, title, and format to save
- Notice there is no white space around the map image

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## Viewed in Google Maps

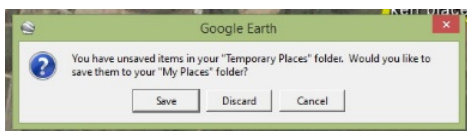


- Select this option to open your current view in an internet browser
- You can copy the address
- Notice that your places do not show up in Google Maps
  - You can do this by posting your places to Google Earth Community Forums (right click place and see options)

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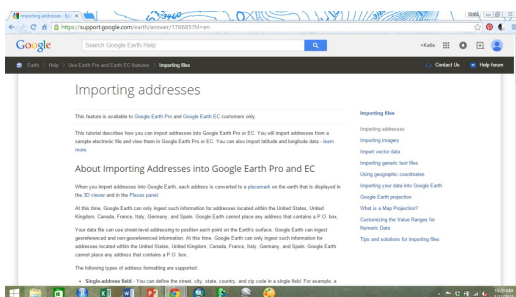
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## Closing Google Earth Pro



- When you close Google Earth Pro, you may have unsaved items in “Temporary Places”
- Be sure to check this folder before closing to decide whether to save them in “My Places” or whether to discard them

## Additional Geocoding tutorial



- Google Earth Pro has the option of adding placemarks for an entire file of addresses
- See the tutorial:
  - <https://support.google.com/earth/answer/176685?hl=en>
- The tutorial includes a sample file to work with (linked in tutorial)
  - <http://services.google.com/fh/files/misc/samplefile.csv>

Questions?

- **Contact information**  
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