Written by Natalie M. Susmann. Spring 2022.
Image from: Mason, David J. 2007. "The Location of the Treasury of Atreus." Oxford Journal of Archaeology 26(1): Figure 1.

Archaeological Surveys with **Google Earth** Pro

How to georeference:

If you want to learn how to georeference (i.e. warp and stretch the map) please refer to the **Georeferencing Historic Maps with Google Earth tutorial**.

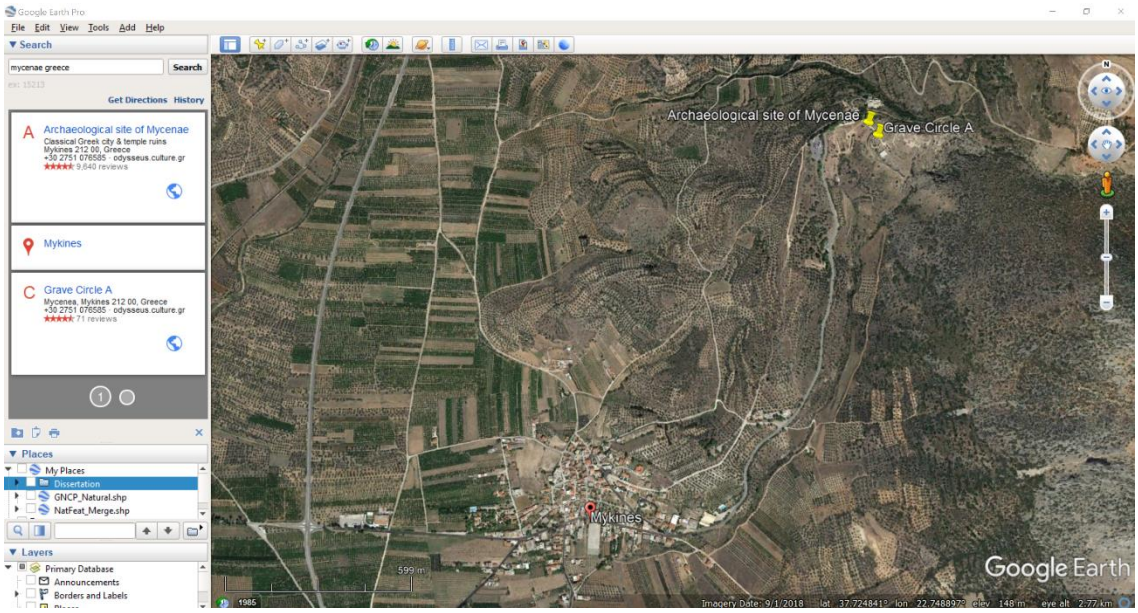
Navigation:

1. Open Google Earth

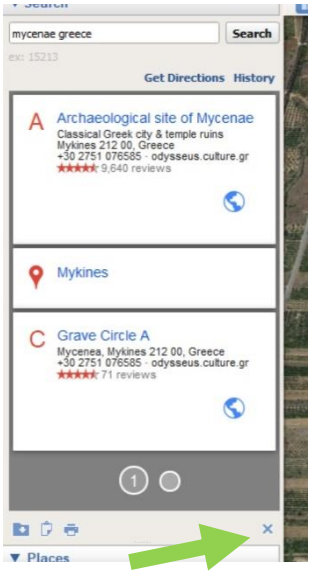
2. If you've never used this software before, click here to review some basic moves.

3. In the search bar, type "Mycenae, Greece" and click search/hit Enter.

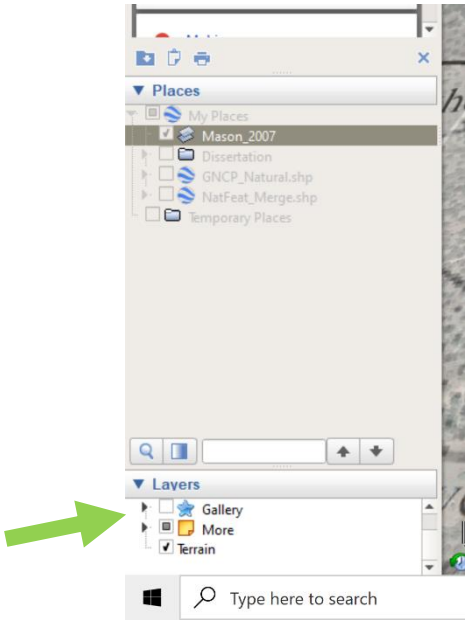
4. The satellite imagery will look similar to below. It's zoomed into an area including both the modern city of Mycenae (i.e. Mykines) as well as the ancient site of Mycenae.



5. On the side of your Google Earth screen, click the **x button** underneath the search results. We're just doing this to declutter your screen.

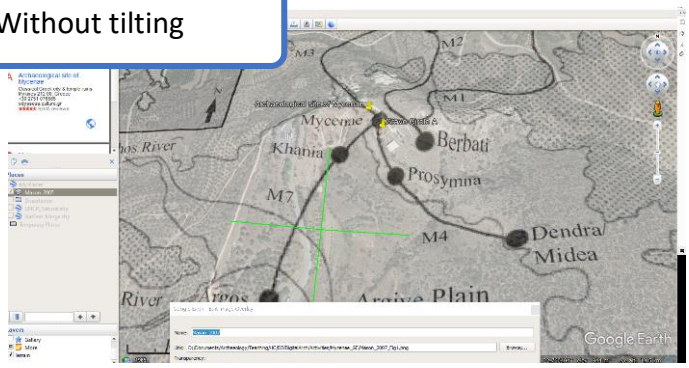


6. You can turn on/off the terrain. Terrain makes Google Earth look 3D. Terrain is located on the bottom of the screen under **Layers.**

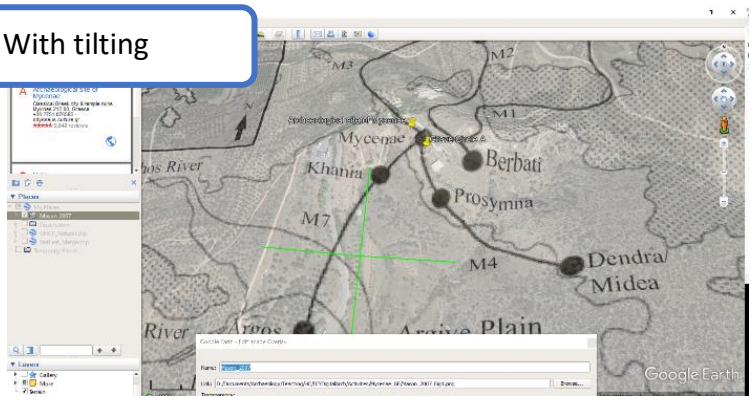


7. Google Earth is automatically set to zoom on a tilt; you're not traveling to a location from directly above. If you want to switch to a top-down perspective, type **r.** Next time you zoom in/out, you'll be back to tilting:

Without tilting



With tilting



Adding a georeferenced image to Google Earth's web browser:

We're going to use a different map that is covering a small area of Mycenae in better detail. It is already georeferenced; when you add it to Google Earth, it will be aligned with the imagery.

You're going to use this map as a guide for finding archaeological sites. You're going to create a file marking the locations of tombs and we will use this data later on in a geospatial analysis.

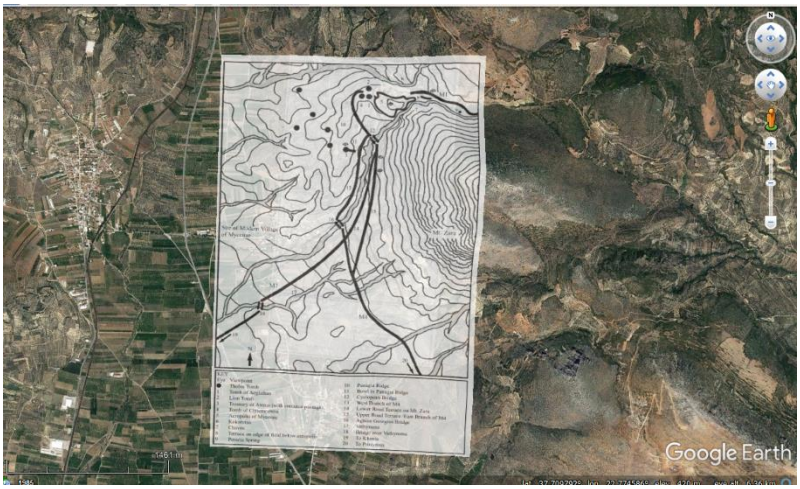
1. Open Google Earth Pro

2. At the top of the screen, go to **File → Open**

3. Choose ***Mason_Tombs***

4. The browser will orient you to the location of the georeferenced map.

5. The map screen should look like this:

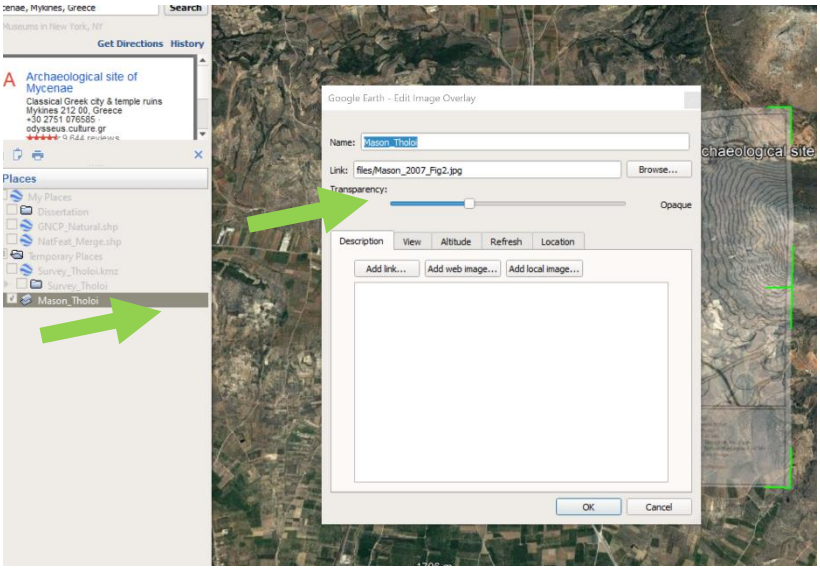


8. Look under **Places.** This is where Google Earth will store preloaded layers as well as any data you add. Everyone's **Places** folder will look a bit different and you might need to expand some sub folders, but you will eventually find ***Mason_Tombs*** listed. Hint: check under **Temporary Places** first.

9. To remind you: this is the map image appearing on the screen. If you click the check mark, the map will disappear. It's still added to Google Earth but just not visible.

10. Click and hold down ***Mason_Tombs*** and drag it up. Drag it until your mouse hovers over **My Places** and let go. This makes sure the map is saved under **My Places.** If you're working on your own computer, it will be there next time you open Google Earth.

11. **Right click** *(Mac: ctrl +click)* on ***Mason_Tombs.*** Click **Properties.** A box appears. This box allows you to edit the appearance of the image. You can drag the transparency slider and this will make the image more or less see-through.



Finding archaeological sites:

6. Zoom in and explore the map. Familiarize yourself with it; try seeing how well the map lines up with the satellite imagery.

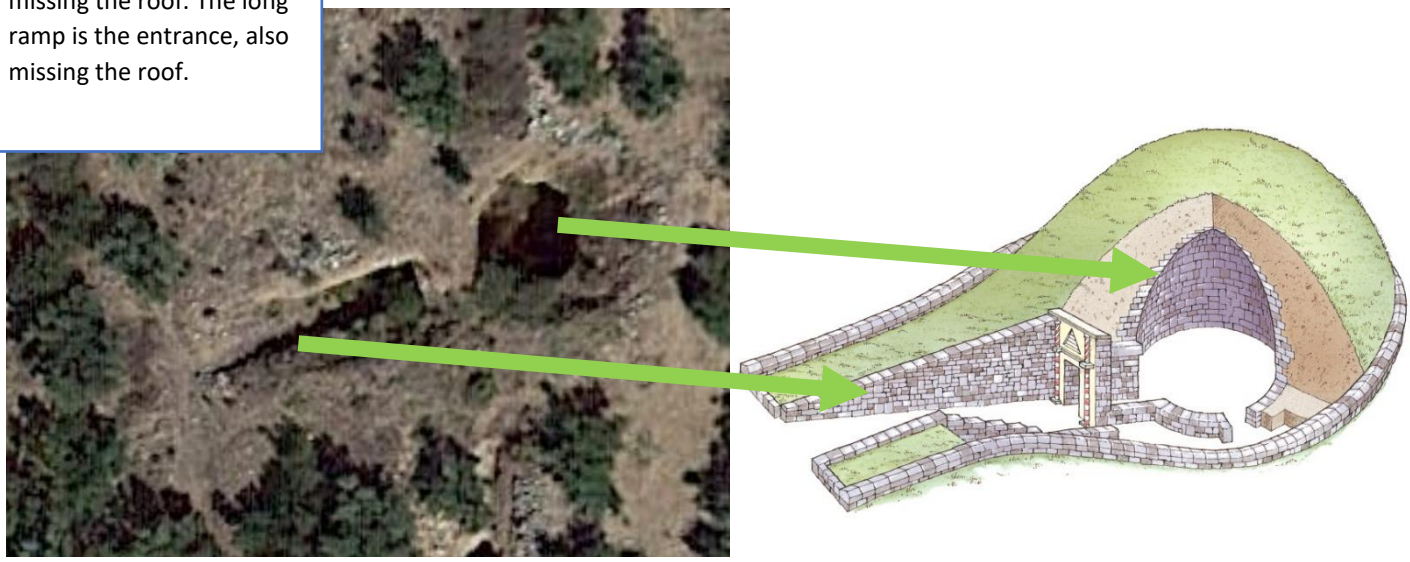
   Mason_Tombs is a map showing locations of tholoi tombs nearby a citadel called Mycenae. The tholoi are marked with dots. Some of them are also numbered. These numbers refer to the map legend (bottom of the map), which lists the official names of the tombs.

In a future class, we are going to use GIS to spatially analyze these tomb locations. Before doing so, we need to create a dataset: a set of points representing the locations of tombs.

Since ***Mason_Tombs*** is georeferenced (i.e. stretched) to line up with the satellite imagery, we can use it as a guide.

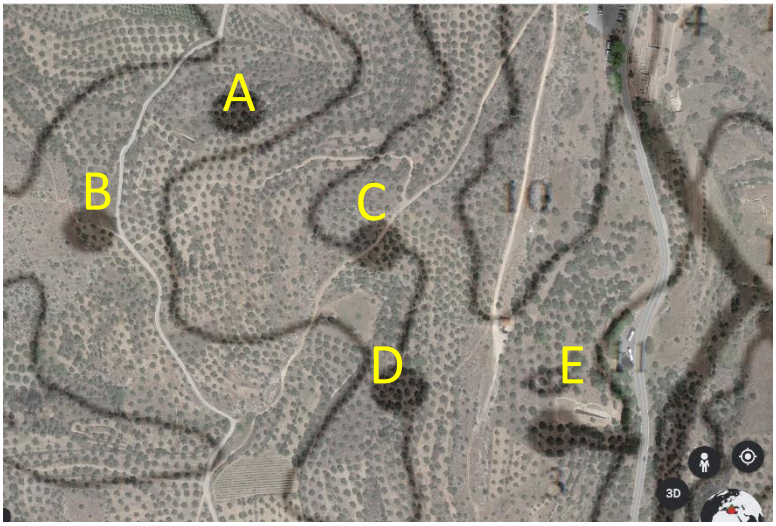
This is what a tomb would look like on satellite imagery:

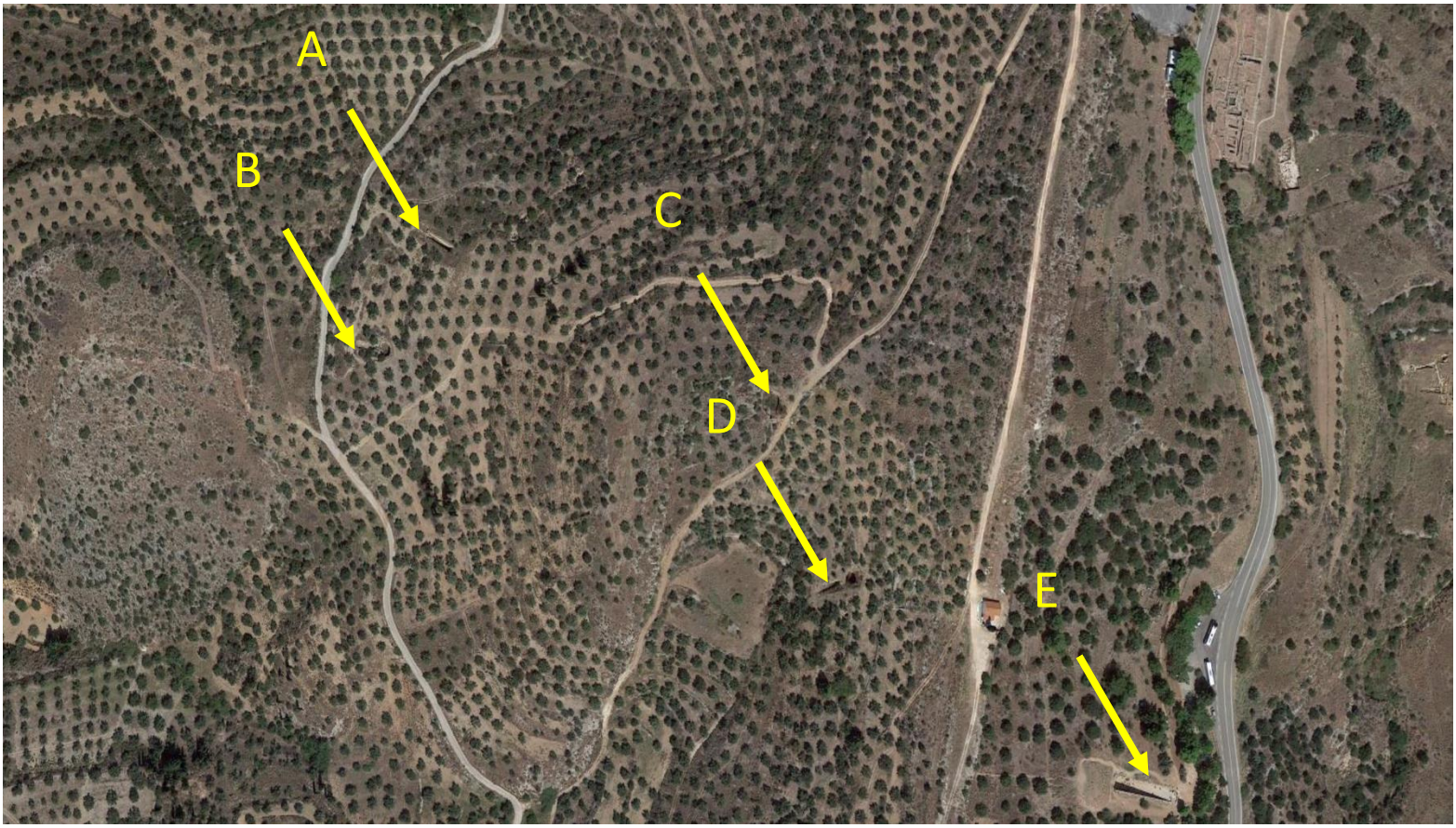
The round circle is the chamber of the tomb, now missing the roof. The long ramp is the entrance, also missing the roof.



8. Using the map as a guide, see if you can find these tombs **on the imagery.** Some hints:
    a. They're not going to fall directly beneath where the map marks them – remember that we've warped and stretched a hand-drawn map. The map is help, isolating a smaller search area.
    b. It helps to adjust transparency, zoom in and out, and even toggle the image on and off.

9. Here's some help if you can't find them:

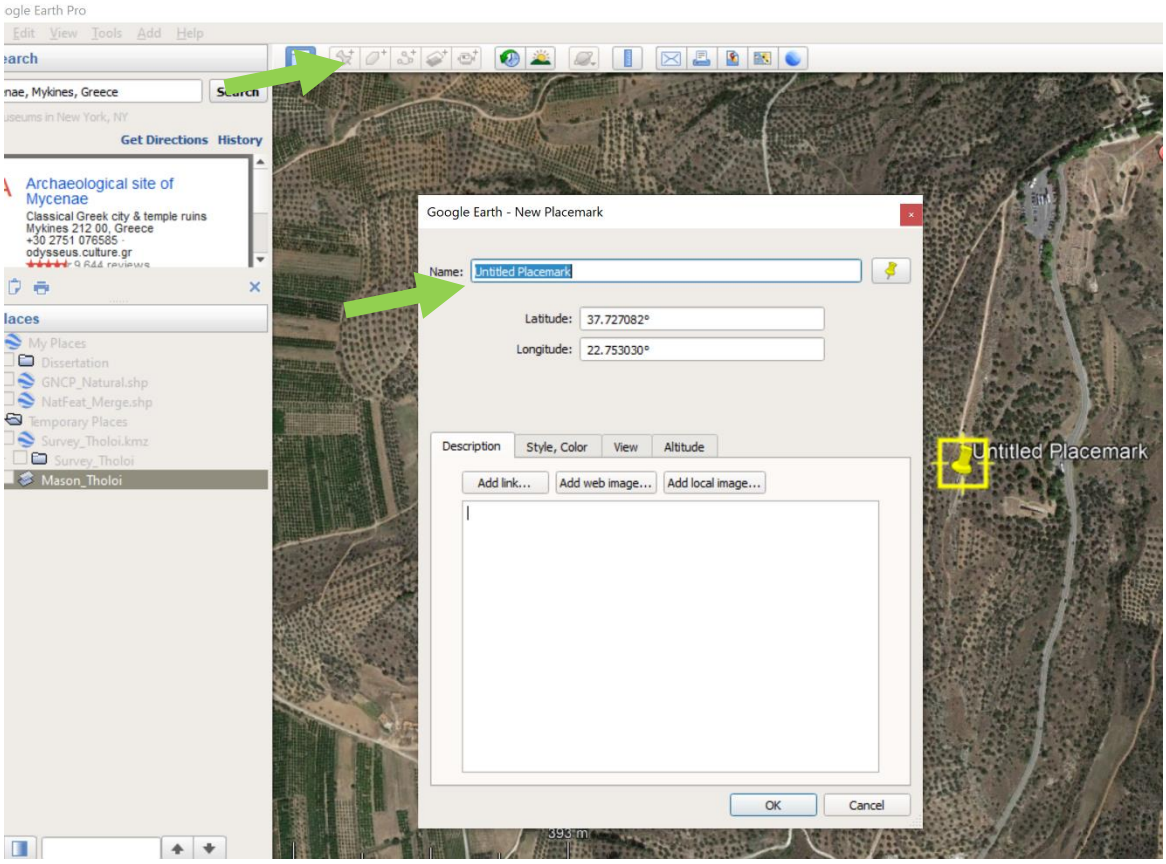




Recording the locations as geospatial data:

10. Now that we've found some tombs on the satellite imagery, we need to record their locations. Zoom into the location of a tomb **as represented on the satellite imagery.** Remember – you're mapping locations of tombs on the satellite, not on the scanned map.

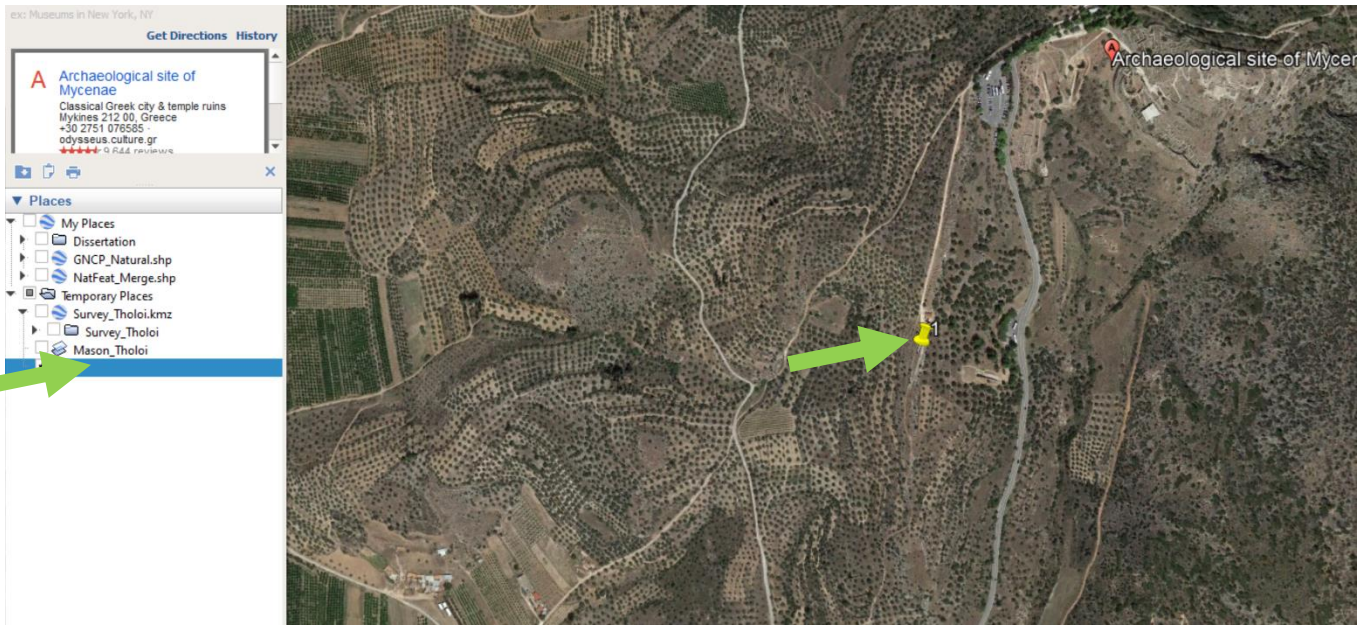
11. On the top of the screen, click the pushpin icon.



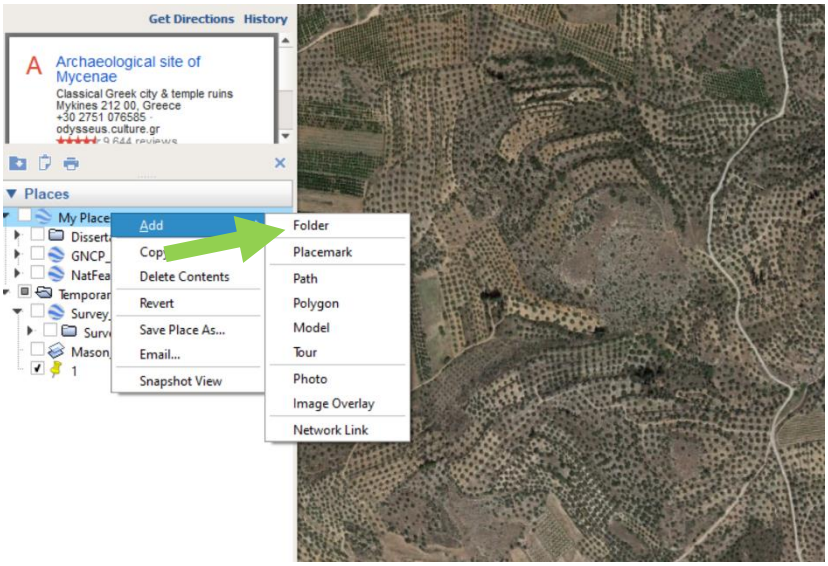
12. **Rename "Untitled Placemark"** into a number (1, 2, 3, so on).

    Optional: you can choose custom marker options. Click **Style, Color** and choose whatever you want. Feel free to play around in this section. **Click OK** on your keyboard.

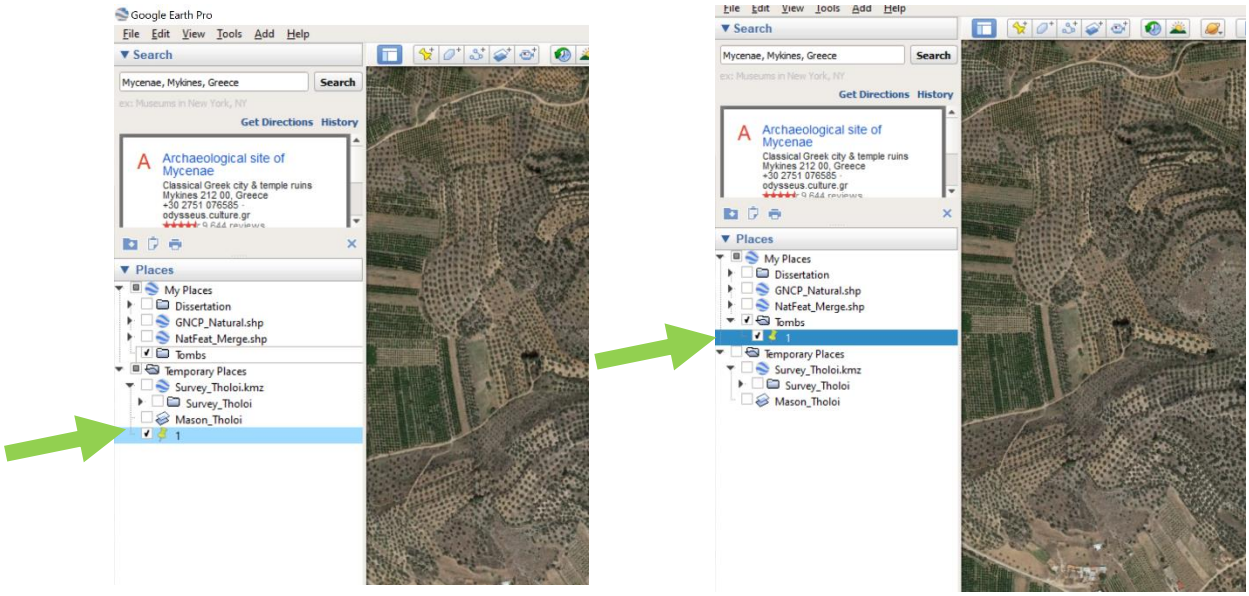
13. A little marker should appear above the tomb with the label. You should also see it listed on the sidebar.



14. Feel free to repeat this process and map out more tombs. When you've got the hang of it, you can **save your work**. Go to **My Places** on your sidebar. Right click → **Add** → **Folder.** Name the folder + click OK.



15. Just as you moved the map image in the beginning, click each tomb (in the list). Drag them into the folder.



16. When you've moved them all, right click on your **Tombs** folder. Choose **Save Places As** and save it to your computer. This will make a KMZ file on your computer.

17. Don't be discouraged if you couldn't do it completely by yourself. It takes practice and requires some experience recognizing remains on the imagery. Creating this file took time, including going to Greece and checking the locations!

18. I've gone ahead and mapped the locations of all these tombs. If you want to see them: go to **File → Open →** choose **Survey_Tholoi** in your Mycenae_GE folder, choose ***Survey_Tholoi.*** This file will appear in your sidebar. Make sure it's check mark is turned on. A bunch of points should appear. Zoom in and see their locations on the map.

Recap:

- You added a historic map to Google Earth that was already georeferenced (i.e stretched) to match up accurately with satellite imagery.
- Using the paper map as a guide, you found locations of archaeological sites on the satellite imagery.
- You recorded these locations as a kmz file. This file represents each tomb as a point.
- With the KMZ file you could:
    - Direct your GPS to bring you to the tombs
    - Do different geospatial analyses (coming soon!)