

Archaeological Surveys with Google Earth Browser

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**.

Optional: Use Google Earth Desktop:

This tutorial uses Google Earth's web browser because it's the most accessible; no one needs to download or install anything.

But, this activity can be done in Google Earth Desktop as well. If you want to use the Desktop application instead, go to **File → Open → Mason_Tholoi**. Read through this tutorial to understand how to find the archaeological sites. When it's time to mark them, go to **Add → Folder →** Make a folder called **Tholoi**. Keep this folder selected. Then, go to **Add → Placemark** and start marking locations of sites.

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

This version of the tutorial is going to use the Google Earth web browser, which does not permit the user to georeference an image. But, we can add images that are already georeferenced (this would have been done in Google Earth **desktop** software or a GIS program).

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.

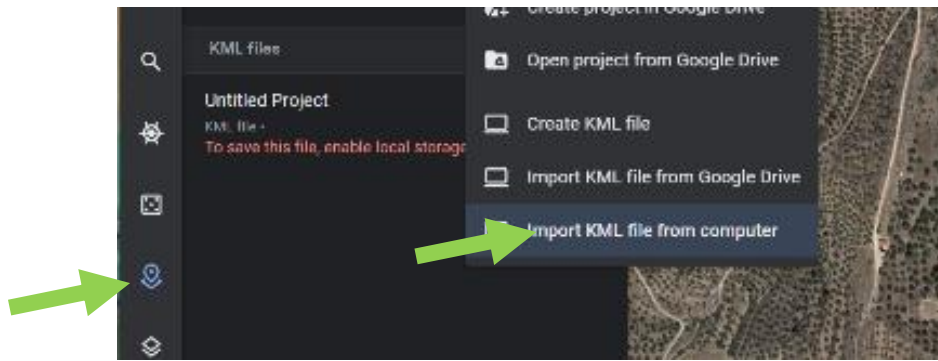
You're going to use this map as a guide for finding archaeological sites. You're going to create a file marking the locations of tombs and we will use this data later on in a geospatial analysis.

1. Go to <https://earth.google.com/>.

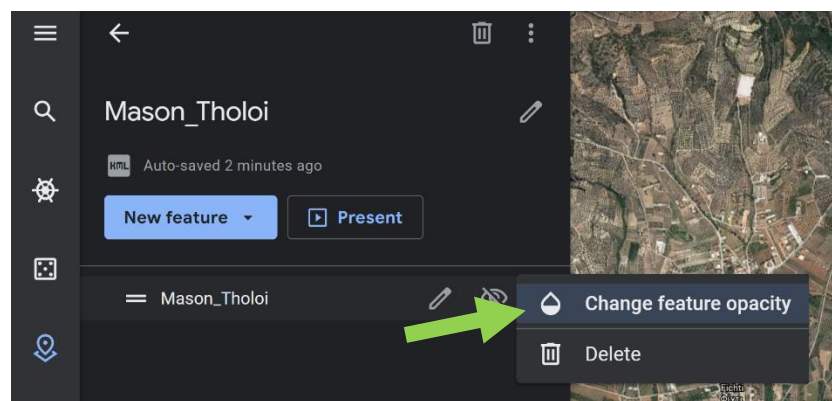
2. On the side bar, click on the Projects button



3. Click on **New Project → Import KML File from computer →** in your Mycenae_GE folder, choose **"Mason_Tholoi"**



4. The browser will orient you to the location of the georeferenced map.
5. **On the side bar**, you will see **Mason_Tholoi** listed. At the second location where Mason_Tholoi is listed, hover your mouse. **Click on the 3-button menu** and here is an option **to adjust the transparency of the map**. Adjust it so you can easily see both the map and the satellite.



6. The map screen should look like this:



Finding archaeological sites:

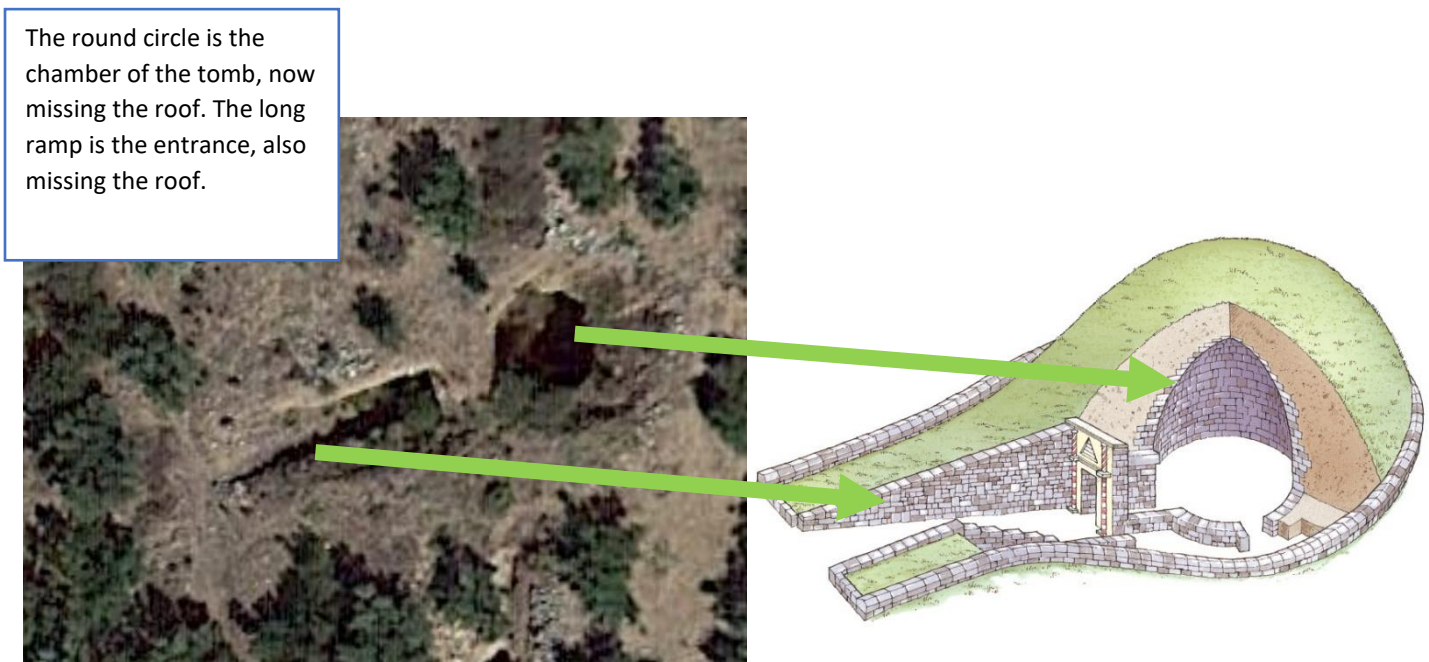
7. Zoom in and explore the map. Familiarize yourself with it; try seeing how well the map lines up with the satellite imagery.

Mason_Tholoi 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.

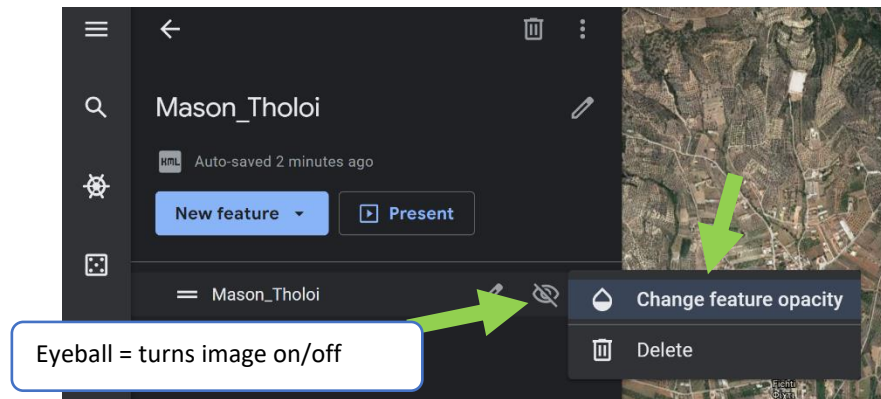
Since **Mason_Tholoi** is georeferenced (i.e. stretched) to line up with the satellite imagery, we can use it as a guide.

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

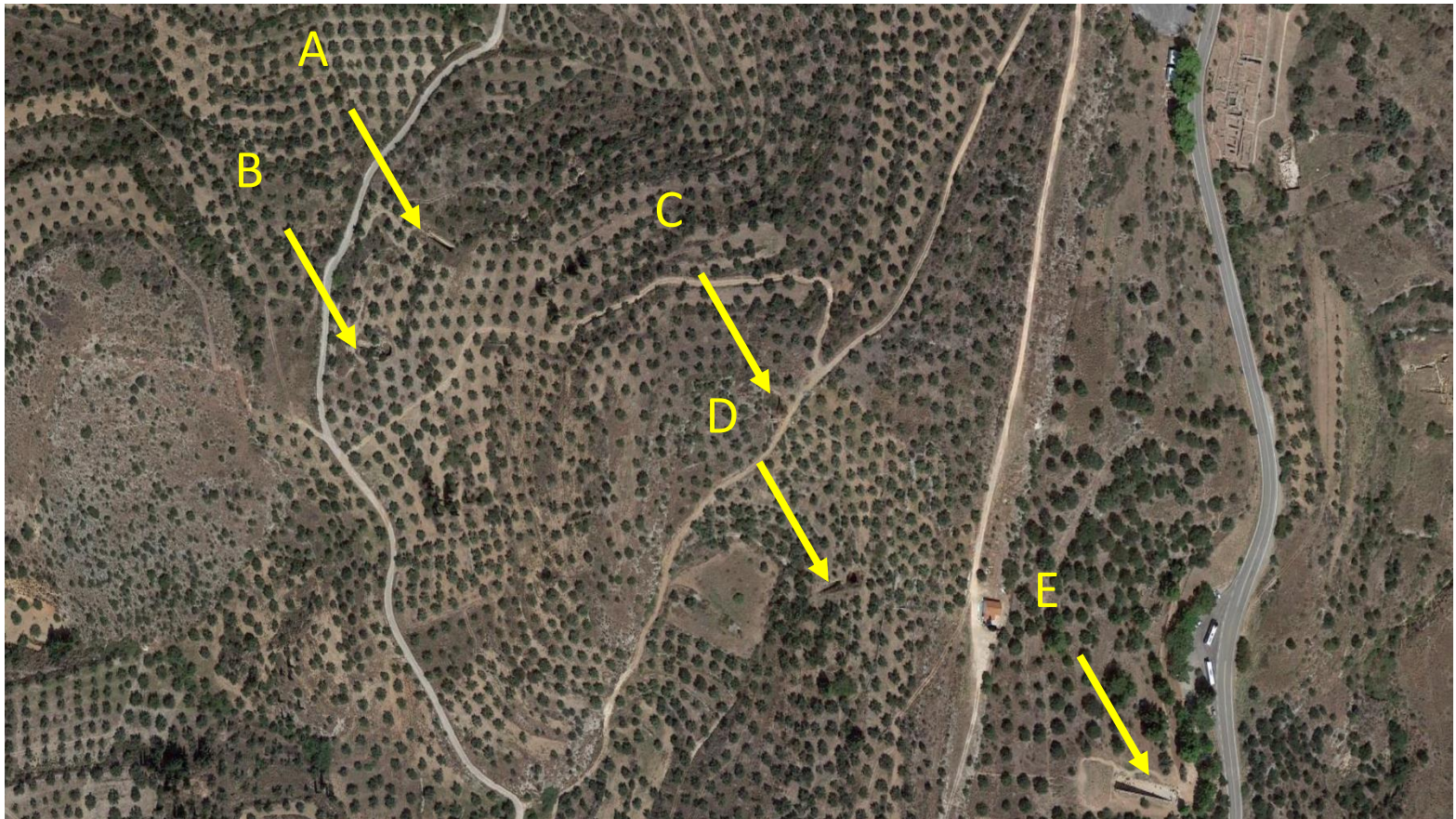


9. Using the map as a guide, see if you can find these tombs **on the imagery**. Some hints:
 - a. They're not going to fall directly beneath where the map marks them – remember that we've warped and stretched a hand-drawn map. The map is help, isolating a smaller search area.

- b. It helps to adjust transparency, zoom in and out, and even toggle the image on and off:

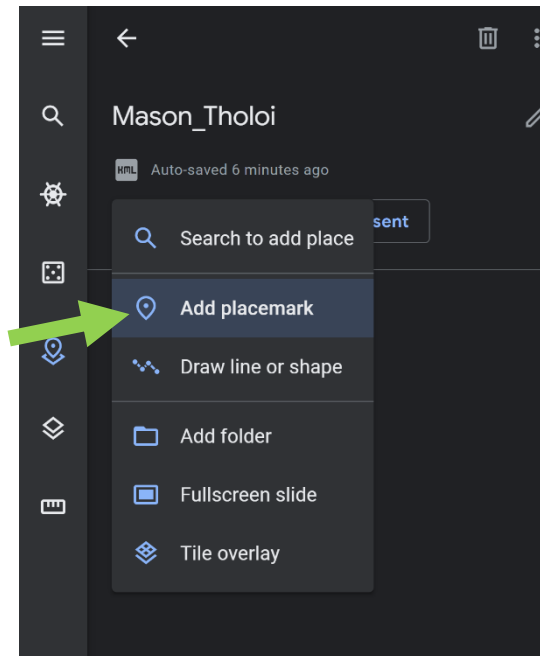


10. Here's some help if you can't find them:



Recording the locations as geospatial data:

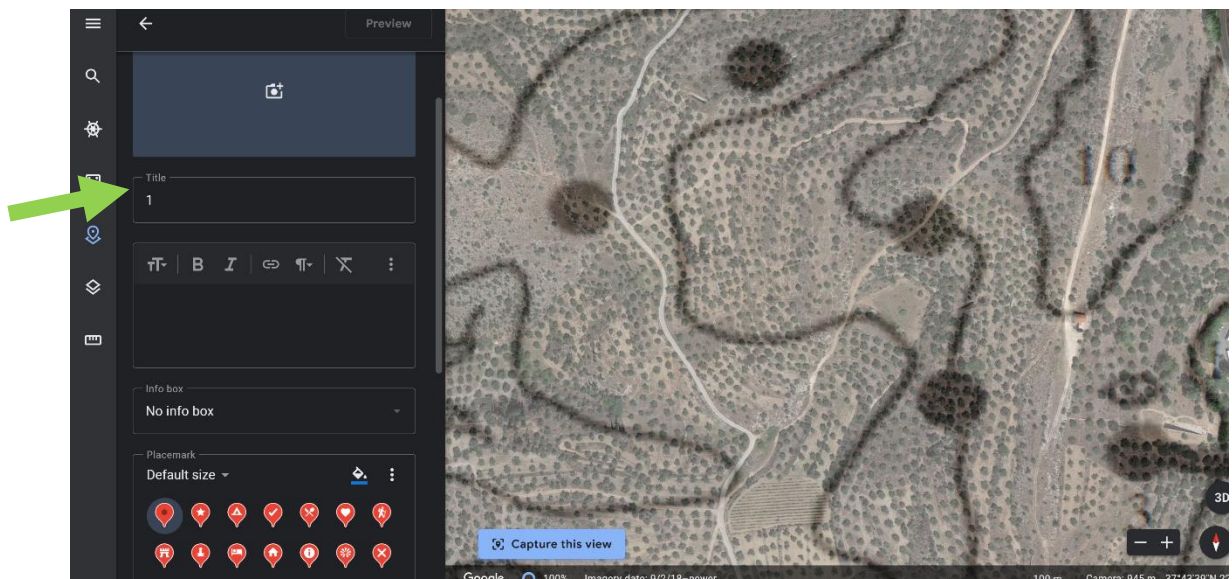
11. Now that we've found some tombs on the satellite imagery, we need to record their locations. On the **Mason_Tholoi** menu, choose **New Feature** → **Add Placemark**. Your cursor should turn into a little X.



12. 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.

13. Click once.

14. The **lefthand side** of the screen shows a new menu. **Rename "Untitled Placemark"** into a number (1, 2, 3, so on). **Hit ENTER** on your keyboard.



15. If you scroll down, you can choose custom marker options. Choose whatever you want and feel free to play around in this section.

16. A little marker should appear above the tomb with the label.



17. Feel free to repeat this process and map out more tombs. When you've got the hang of it, you can **save your file**. Click the **3-button menu** (next to the trash can). Click **Export as KML file**. **Mason_Tholoi** will be automatically downloaded. You can find the file and paste it into your **Mycenae_GE** folder.

18. 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!

19. I've gone ahead and mapped the locations of all these tombs. If you want to see them: go to **New Project** → **Import KML File from computer** → in your **Mycenae_GE** folder, choose **Survey_Tholoi**. A bunch of points will appear.

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!)