The Ranchers Stewardship Alliance Mapping with Maida Virtual Classroom

Series 2: DIY Ranch Mapping in Google Mapping Applications.

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I. Overview of this Learning Document

This learning series introduces **do-it-yourself (DIY) ranch mapping** using Google Earth Pro and Google My Maps. DIY ranch mapping helps make your operation easier to manage today—and easier to understand in the future.

Maps are a powerful tool for people who work on the land. When infrastructure, pastures, and daily decisions are spread across miles, clear and shared maps save time, reduce confusion, and keep everyone aligned. Google Earth Pro and Google My Maps allow you to build maps that reflect how you work across the landscape. You can map gates, fences, pipelines, water sources, and pastures. You can then carry those maps on your phone or share them with family members, employees, neighbors, and consultants.

Instead of relying on memory or verbal directions, a map ensures everyone is looking at the same information. Because maps created in Google Earth Pro and Google My Maps can be used across other applications, the time you invest once can support better communication and decision-making well into the future.

No prior mapping experience is needed—this series is designed for beginners! All tools and services covered are open source, completely free, and best accessed on a computer (tablets are not recommended).

Roman numerals organize the workflow of this learning series:

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II. The Mapping Basics

A. The Components of a Good Ranch Map

A high-quality ranch map is built from a combination of points, lines, polygons, and basemaps. I have created many ranch infrastructure maps, and this combination is what I consider an A+ Ranch Map. When these map features are placed on top of background basemaps—such as satellite imagery—they provide clear, practical information that reflects what is actually on the ground.

We use points, lines, and polygons to represent real-world features, and the choice depends on what you are trying to map.

> ***Points*** are best for representing a single, specific location. They are especially useful for features such as tanks, gates, cattle guards, wells, or creek crossings. Because a point contains latitude and longitude information, it helps answer questions like: *Where exactly is that gate?*
>
> ***Lines*** are used to represent linear features such as roads, streams, pipelines, fences, and boundaries. Lines allow you to measure distance, which helps answer questions like: *Approximately how many feet of pipeline do I need to reach the other side of a pasture?*
>
> ***Polygons*** represent areas, such as pastures or allotments. Polygons allow you to calculate area and answer questions like: *How many acres are in this pasture or allotment?*

Map Layers

Map layers are essential for organizing information. A map layer can be thought of as a folder or book that holds the same type of map features. The benefit of using layers is that they can be saved as files and shared across applications. This is how the information in

your head can be shared with others, rather than relying on pointing, waving, or yelling across a pasture.

Map File Types

Once map layers are created, they can be saved as files. A mapping file is a specialized digital file that stores a map layer along with its geographic information, linking points, lines, and polygons to real locations on Earth. Three common mapping file types you will likely encounter are **KMLs** and **KMZs**, which are Google file types, and **shapefiles**, which are commonly used in ESRI mapping platforms.

Storing Your Mapping Files

Spatial files such as KMLs, KMZs, or shapefiles can be stored locally on your device or in cloud-based platforms like Google Drive or OneDrive. This makes it easy to share your maps with others so they can view pasture boundaries, gates, or infrastructure on their own phone or computer. This is especially helpful when working with consultants, government agencies, or other team members.

B. Google My Maps VS Google Earth Pro

Both Google My Maps and Google Earth Pro are useful tools for creating ranch maps, and they share several core capabilities. However, they differ in how they are used and what they are best suited for.

- **Google My Maps** excels at collaboration and simplicity.
- **Google Earth Pro** excels at advanced mapping, analysis, and visualization.

Feature / Capability	Google My Maps	Google Earth Pro
Application Type	*Web-based (browser)*	*Desktop application*
Internet Required	*Yes (for editing)*	*No (after installation)*
Create Points, Lines & Polygons	*Yes*	*Yes*
Export KML / KMZ	*Yes*	*Yes*
Real-Time Collaboration	*Yes*	*No*
Ease of Use	*Very user-friendly*	*Moderate learning curve*
Advanced Measurement Tools	*Limited*	*Yes*
3D Terrain & Visualization	*No*	*Yes*
Historical Imagery	*No*	*Yes*
Print Maps	*Limited*	*Yes*
Import Shapefiles	*No*	*Yes*
Import Raster Data	*No*	*Yes*

Table 1: The differences in features and capabilities between Google My Maps and Google Earth Pro.

III. Introduction to Ranch Mapping in Google My Maps

A. Overview of Google My Maps

Google My Maps is a free, web-based map making tool that lets you create personalized and interactive maps by adding your own points, lines, polygons, and notes on top of a basemap.

How to Access Google My Maps

- Since Google My Maps is a web-based mapping tool, a quick google search and a google account will take you right to the mapping interface.
- A google account is required to utilize google my maps, and you can create a free google account if you don't already have one.

Sharing & Collaboration in Google My Maps

- Google My Maps allows you to share your maps with others real-time by inviting users to collaborate or view a project.
- The map layers (containing points, lines or polygons) you make can be exported and saved, and you can import additional map layers.

B. Making maps on Google My Maps

In this section, we will be creating an infrastructure map using points, lines, and polygons, and exporting and saving these map layers.

To access Google My Maps, open your Google Browser and search "Google My Maps", or click the link HERE. You will need to create a free google account or login to your Google account if you already have one.

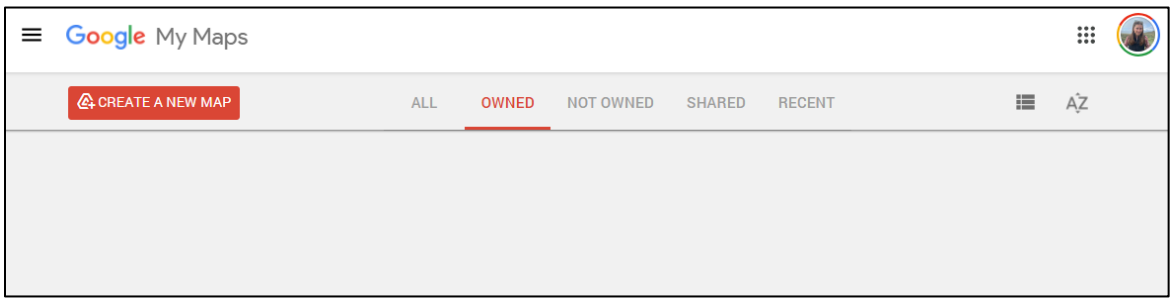


Figure 1: Google My Maps homepage once you have login with your google account. To create a new map project, click Create a New Map.

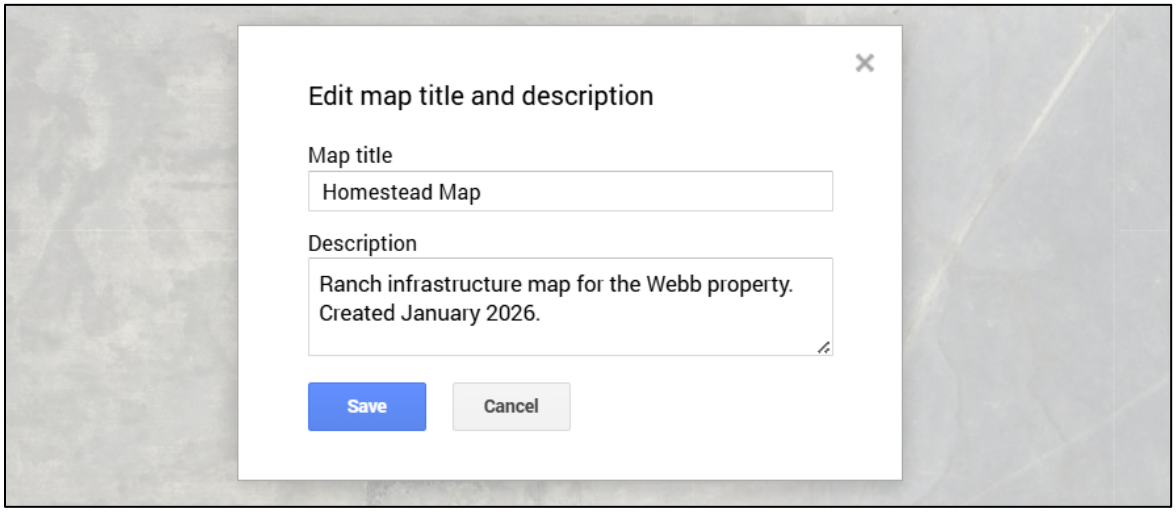


Figure 2: Once in Google My Maps, the first thing you should do is title your project and give it a description. To change the name, navigate to the three dots next to the Untitled Map window.

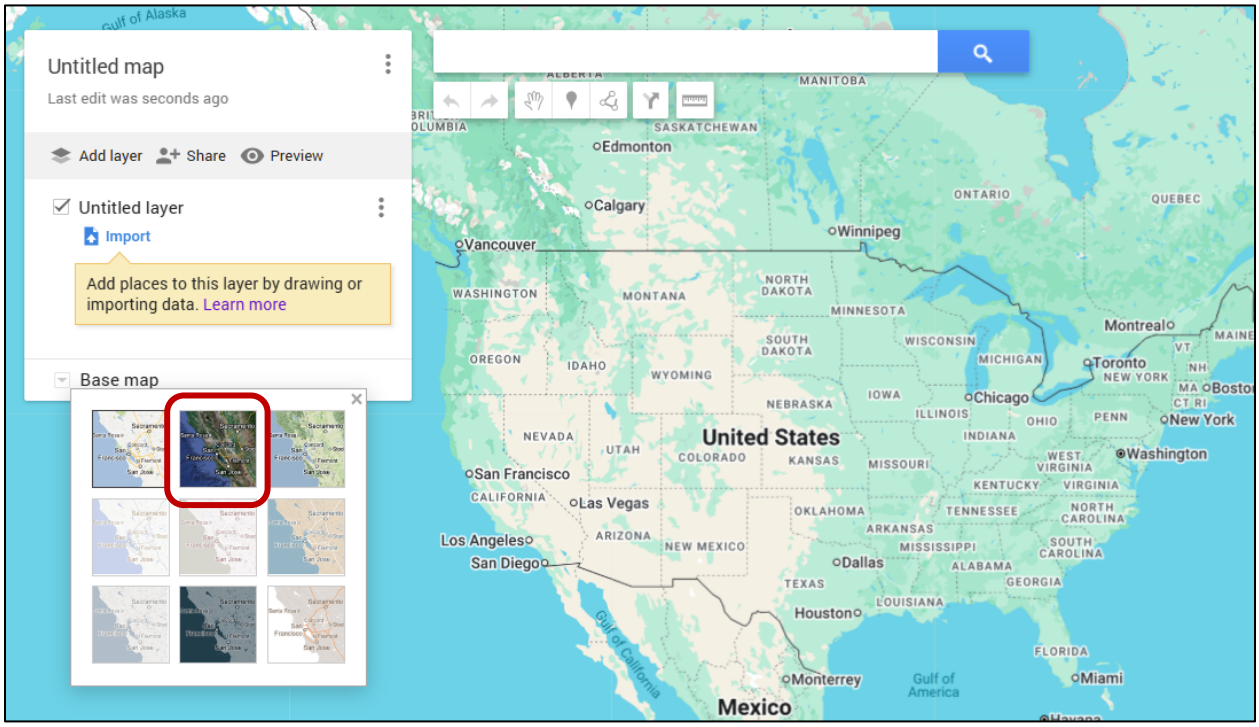


Figure 3: New Map interface for Google My Maps. In this window, the map can be named, shared, and edited. To change the basemap, click the base map tab. When navigating to a place, I prefer to use the satellite image base map.

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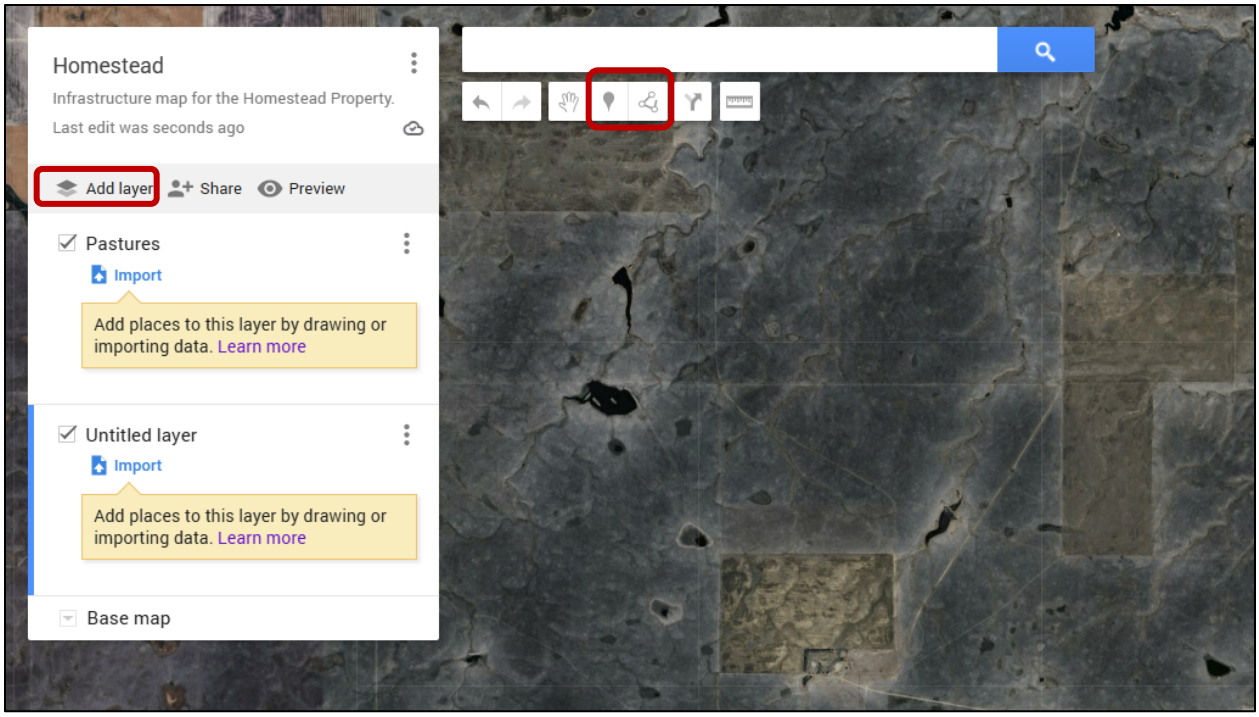


Figure 4: To start drawing points, lines, and polygons, click the add layer icon. This will add a map layer to your map, and you can begin drawing. To specify which map layer you are saving your points lines and polygons to, click on your map layer. To begin drawing, click either the point or line/ polygon icons.

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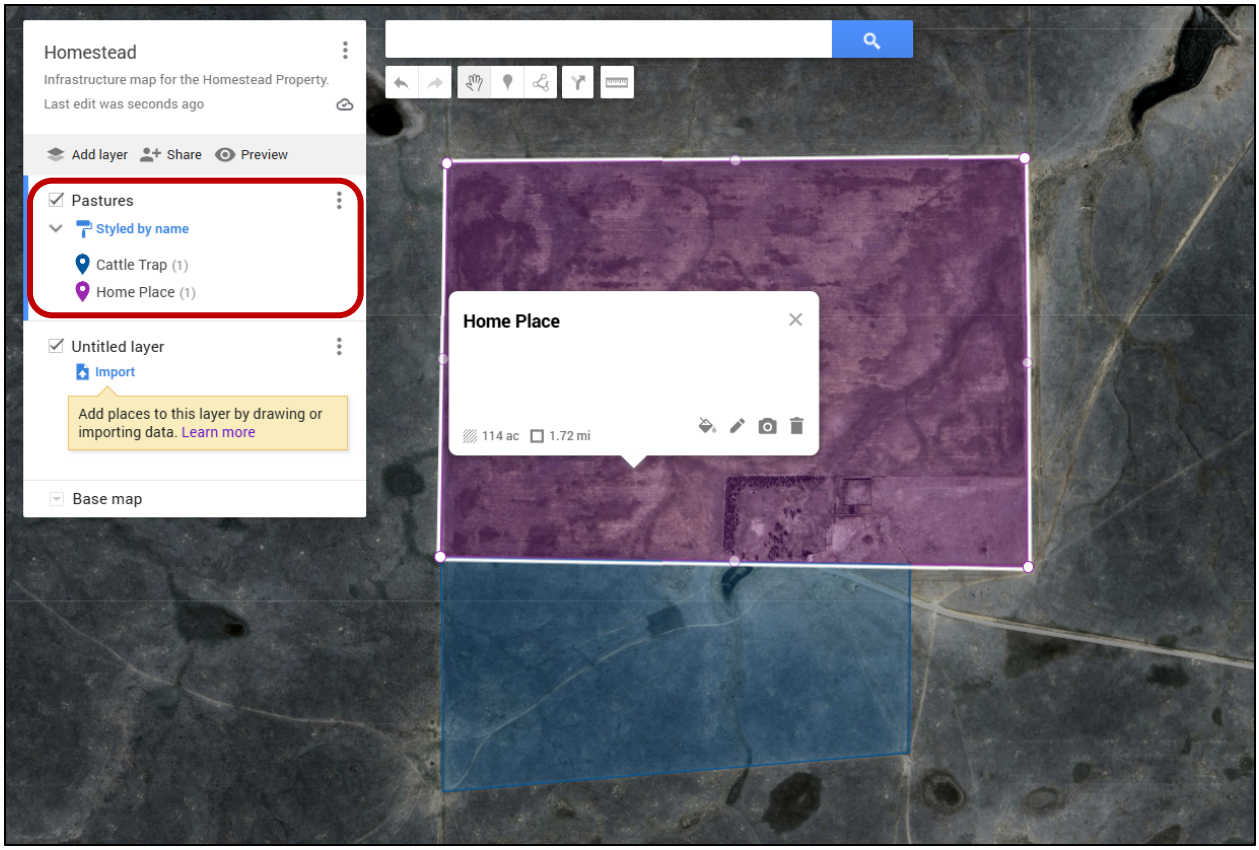


Figure 5: Once you have drawn your features in your map layer, you can edit the name, style, and view the feature's metrics.

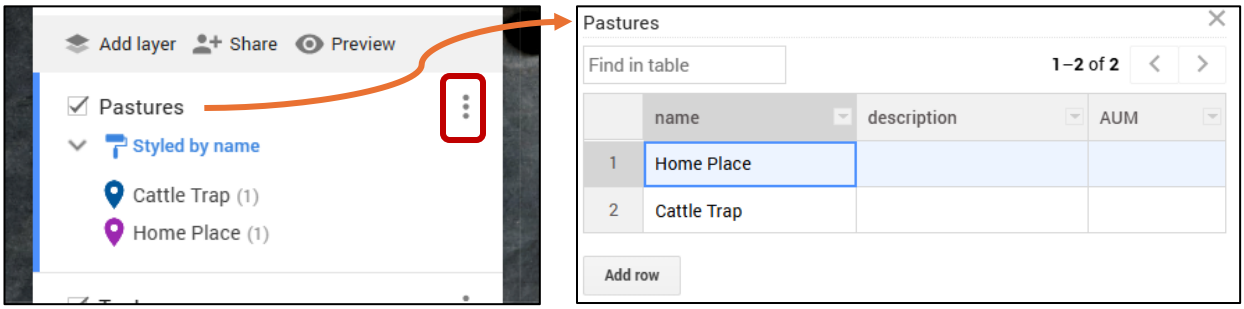


Figure 6: Each map layer that you create has an associated table. To open the table, click on the three dots next to the layers name. In this table, you can add columns that can display and store information. In this table, I added a column for the AUM's that are associated with each pasture.

C. Saving, Exporting your Map

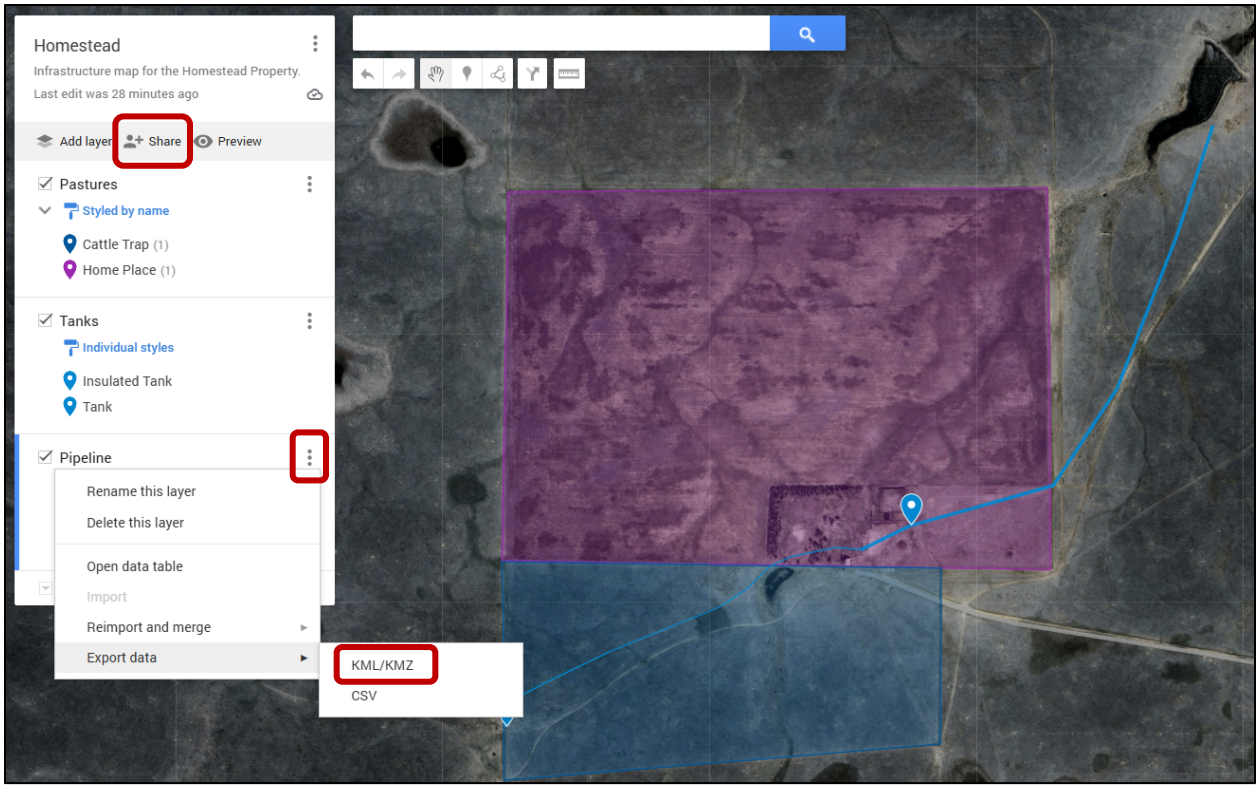


Figure 7: To share your map hit the share button. The Google My Map can be shared via a link or shared through Google Drive. To export and save the individual map layers, click the three dots next to the individual map layer. This will pop up the export data window where you can save your layer as a KML.

The KML files can be saved to your local device, or a cloud-based application such as OneDrive or Google Drive.

IV. Introduction to Ranch Mapping in Google Earth Pro

A. Overview of Google Earth Pro

Google Earth Pro is a free desktop application that lets you create personalized and interactive maps by adding your own points, lines, polygons, and notes on top of a basemap. Additionally, Google Earth Pro provides satellite imagery, 3D terrain, historical imagery, and advanced measurement and mapping tools, which allows for more detailed spatial analysis and visualization.

How to Access Google Earth Pro

- Unlike Google My Maps (which runs in a web browser), Google Earth Pro is installed on your computer as an application.
- The application can be downloaded from Google's official Google Earth Pro download page and installed like any other desktop software. Once installed, Google Earth Pro can be launched from your computer rather than a browser.
- Google Earth Pro is free, and there is no account needed to utilize the application.

Sharing & Collaboration in Google Earth Pro

- Google Earth Pro does not support real-time collaboration like Google My Maps, but your map layers (containing your points, lines or polygons) can be saved and shared as KML files. Additionally, you can import map layers.

B. Downloading Google Earth Pro onto your Computer

To download Google Earth Pro, you must have these computer requirements:

- Operating System Requirements:
  - Windows: 7 or newer.
  - Mac: OS X 10.8 or later.
  - LINUX: Ubuntu 14 / Fedora 23 or newer.
- CPU: A 2GHz or faster AMD64- compatible processor is recommended
- System Memory: 4GB of RAM is recommended.
- Hard Disk Space: 4GB of available hard disk space is needed.
- Internet: Connection to internet is required.

For more information, visit https://support.google.com/earth/answer/21955?hl=en

Install Google Earth Pro on Windows

1. Download Google Earth Pro.
2. Double-click the file and follow the installation process.
3. To open Google Earth Pro, click **Start > Programs > Google Earth Pro**. Then, click Google Earth Pro

Install Google Earth Pro on a Mac

1. Download Google Earth Pro.
2. Open "GoogleEarthProMac-Intel.dmg".
3. Open the "Install Google Earth Pro.pkg" file and follow the installation process.
4. To open Google Earth Pro, open your Applications folder and double-click Google Earth Pro.

Note: *During the installation process, Mac OS X will ask for an administrator password. This information is never shared with Google.*

C. Making Maps in Google Earth Pro

In this section, we will be creating an infrastructure map using points, lines, and polygons.

Open the application.

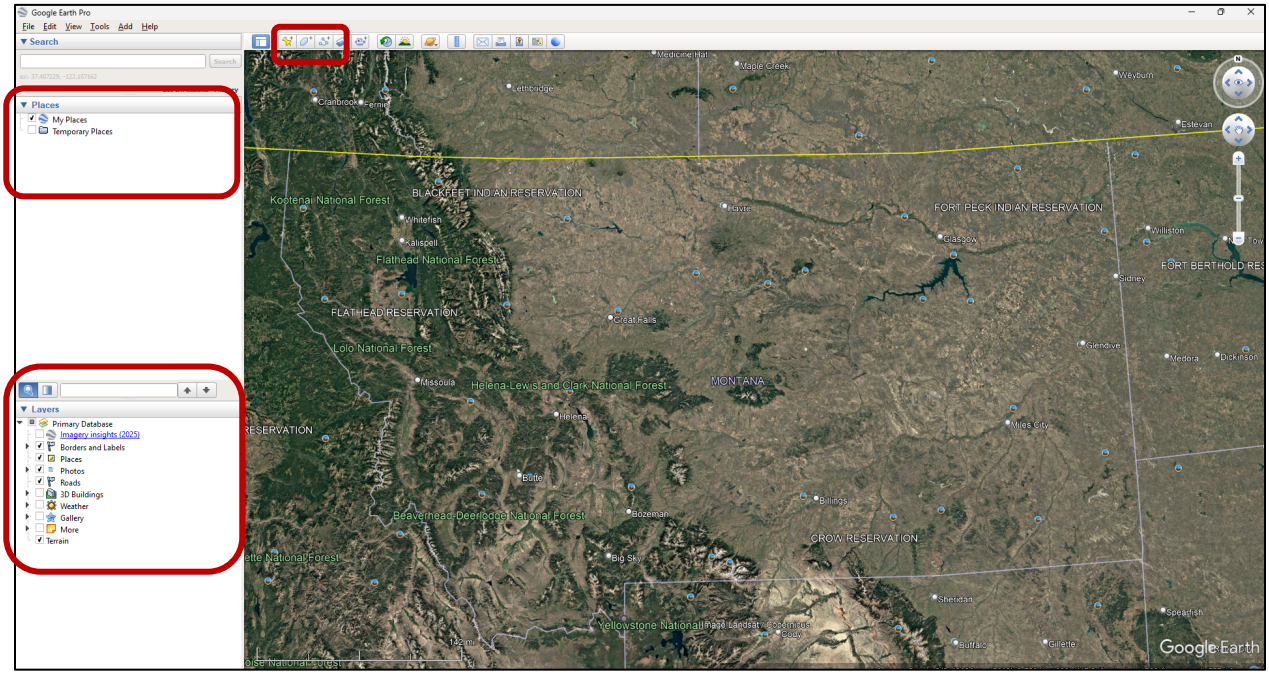


Figure 8: The Google Earth Pro Application. On the left side, there is the Places window, and this is where you can store your map layers. Below the places window, there is a layer's window, and this is where you can turn on or off additional layers such as road and boundaries. At the top bar, there is a point, line and polygon icon in addition to the other tools. These icons are used to create features, such as pasture polygons. Zoom into the area where you will be drawing your first pasture polygon.

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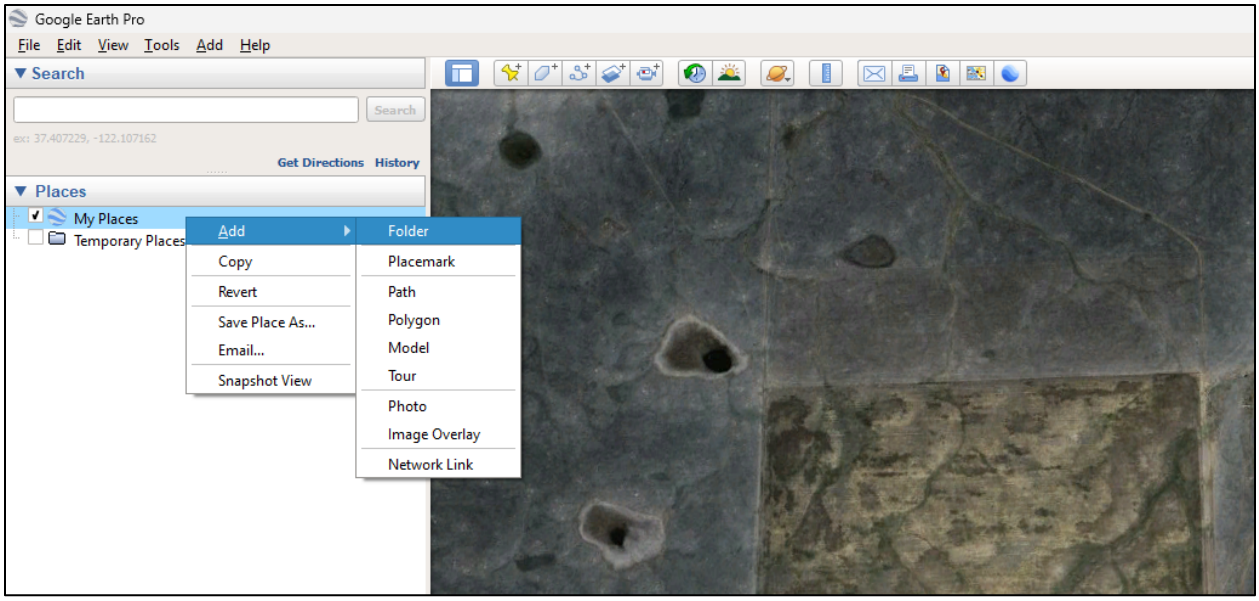


Figure 9: To start drawing your features, under my places right click to add a new folder and title your folder after the feature you will be mapping. This is how we will organize our map layers.

The benefit of creating layers under My Places instead of Temporary Places is that your features will save even if you close Google Earth Pro.

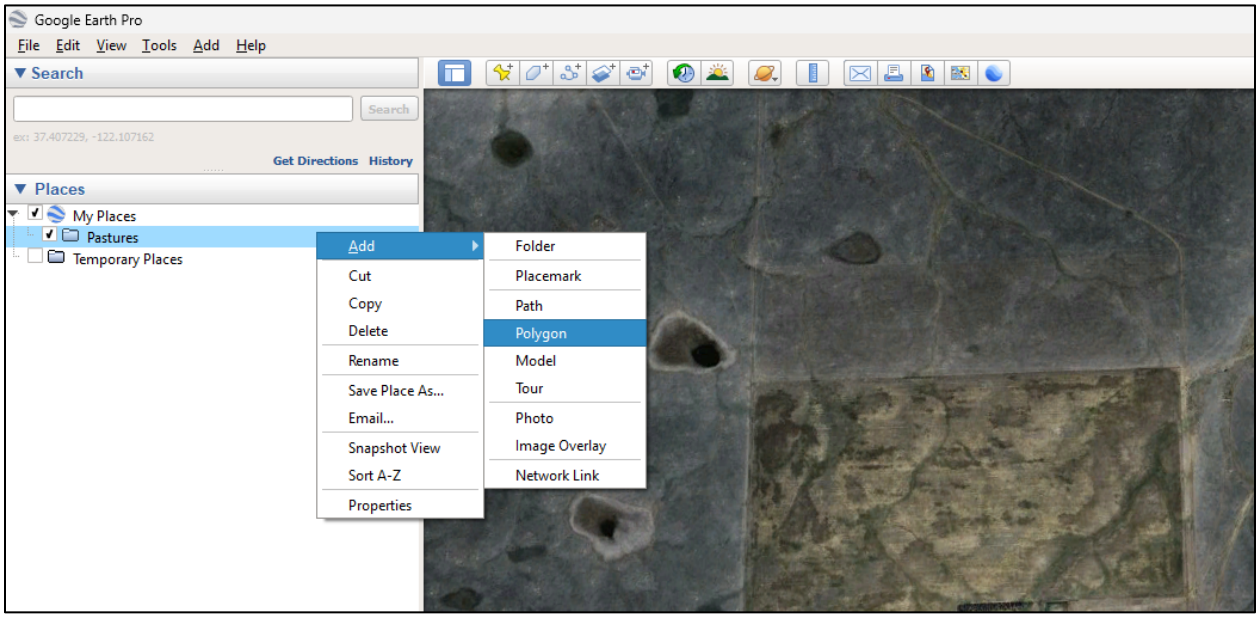


Figure 10: To start drawing your features under your newly created folder, click add polygon.

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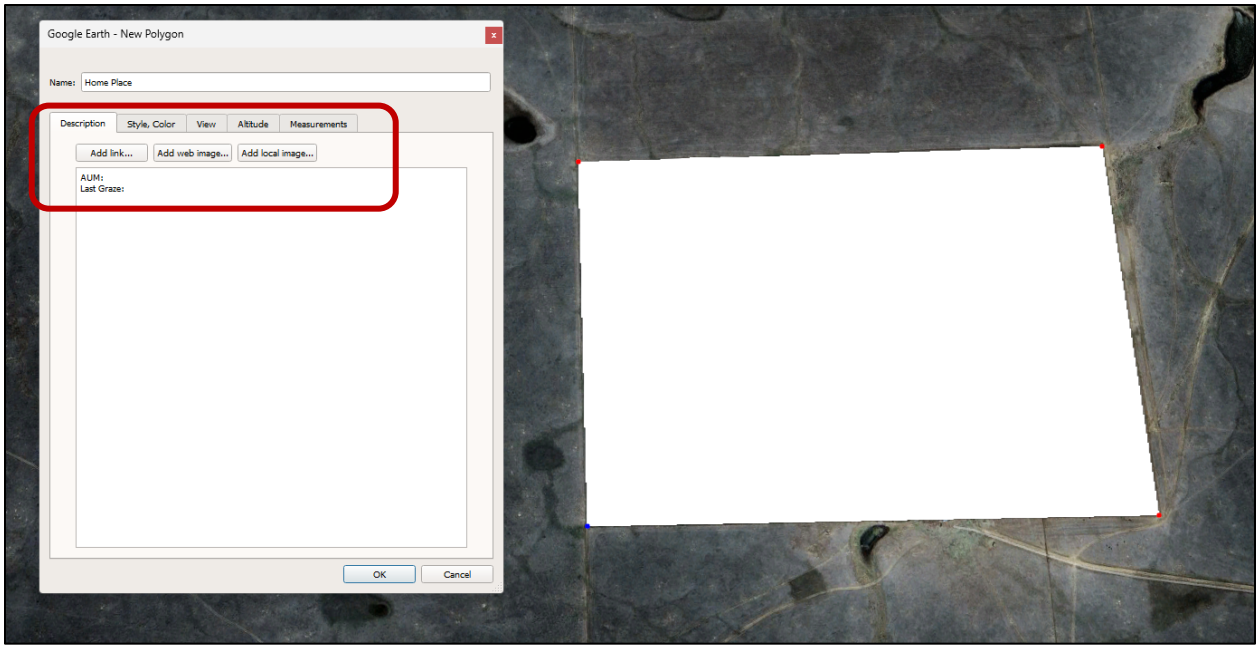


Figure 11: To edit the name, description, color, and measurements of your polygon, utilize the New Polygon (properties) window. To save and finish your polygon, click OK.

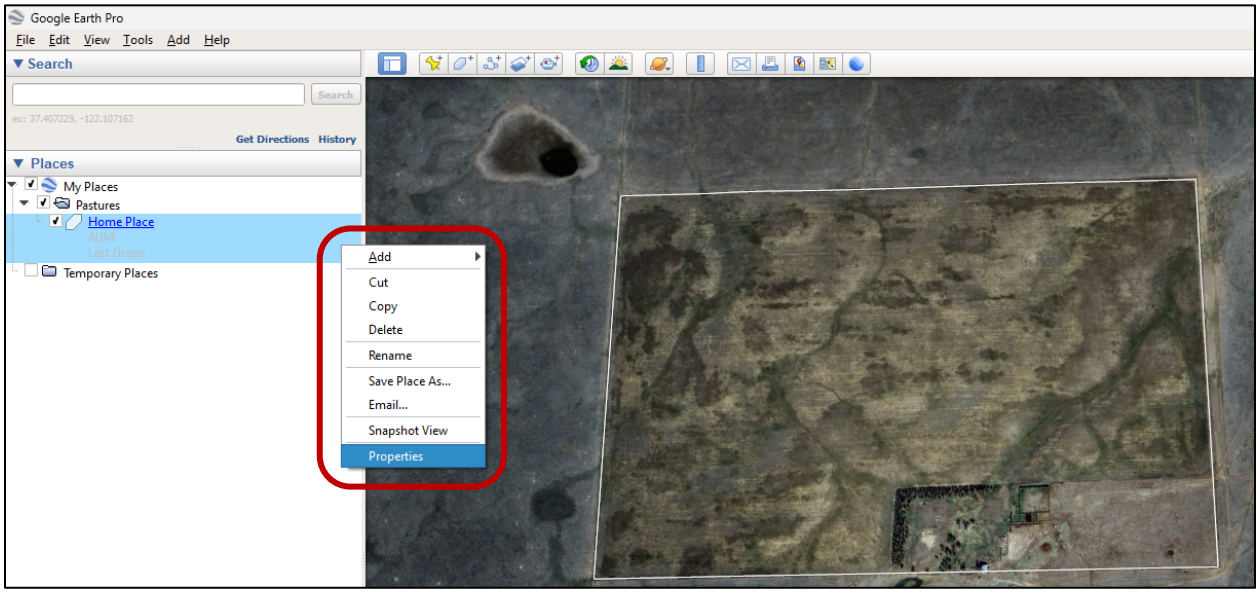


Figure 12: After hitting OK, your new polygon will show up under your pastures folder, which is acting as your map layer for all of your polygons. If you need to edit a feature, click back to the feature and open the properties pane. Repeat the process shown in **figure 10 & 11** to continue to add additional pastures.

To add additional features such as water sources, gates, or pipelines, add new folders as shown in **figure 9** and continue to repeat the drawing process as shown in **figure 10 & 11**.

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D. Saving & Exporting Your Map Layers

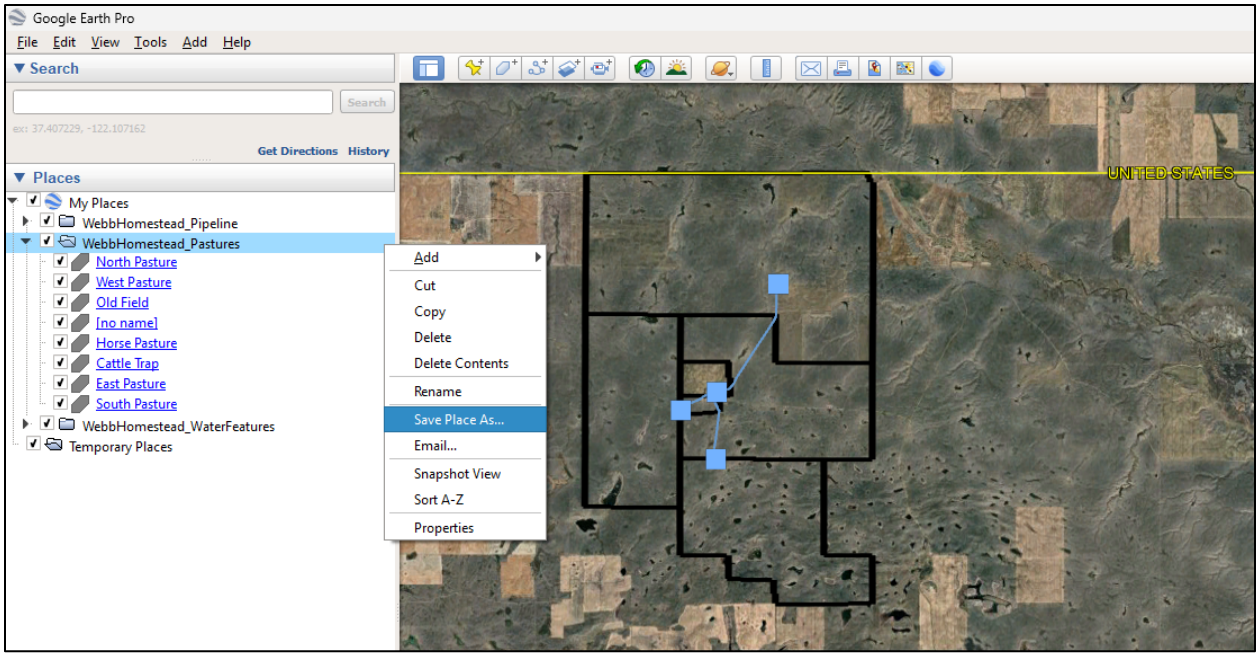
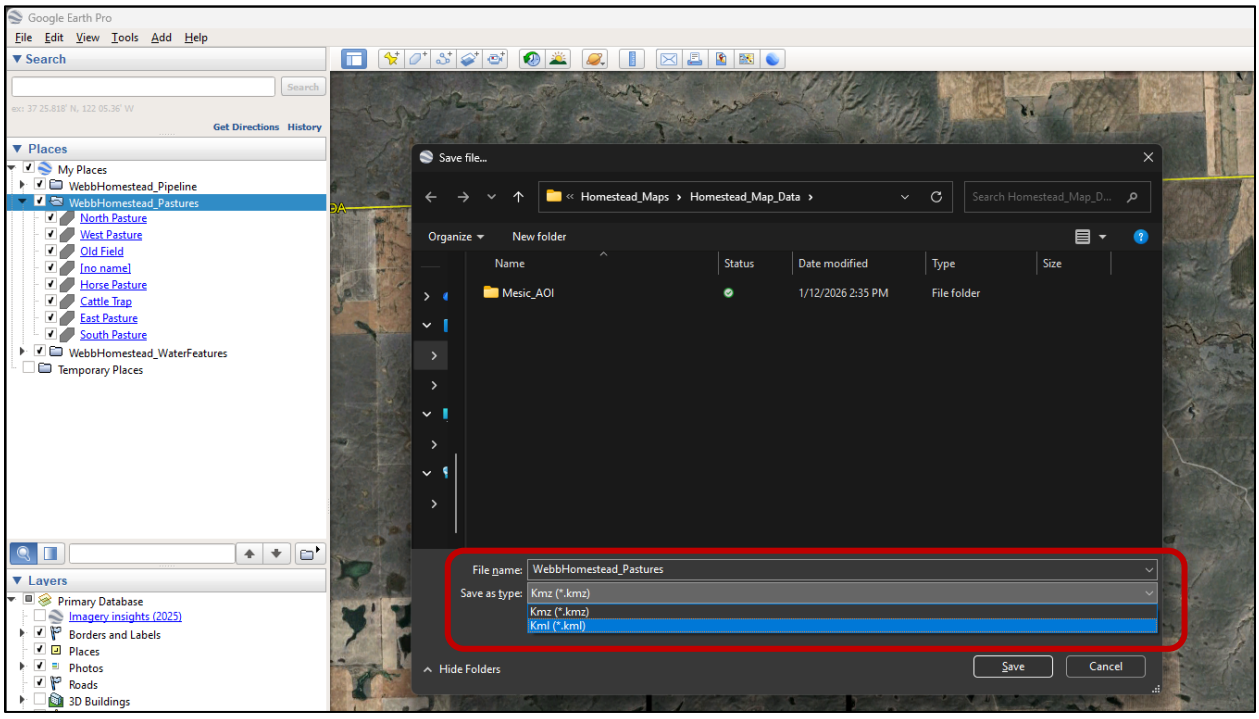


Figure 13: To export a layer, highlight the layer and right click to open the information window. Then click Save Place As....



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Figure 14: After clicking Save Place As… Google Earth Pro will ask you where in your file system you would like to save your layer. Ensure you have a good organizational strategy in your file system before saving your file.

Most applications like the Rangeland Analysis Platform, Stock Smart, and OnX Hunt only take KML, not KMZ. Make sure to specific the file type under the File Name. Then click Save.

E. Additional Tools in Google Earth Pro

Google Earth Pro offers five additional tools that may be of interest to land managers.

1. Advanced Measurement Tools

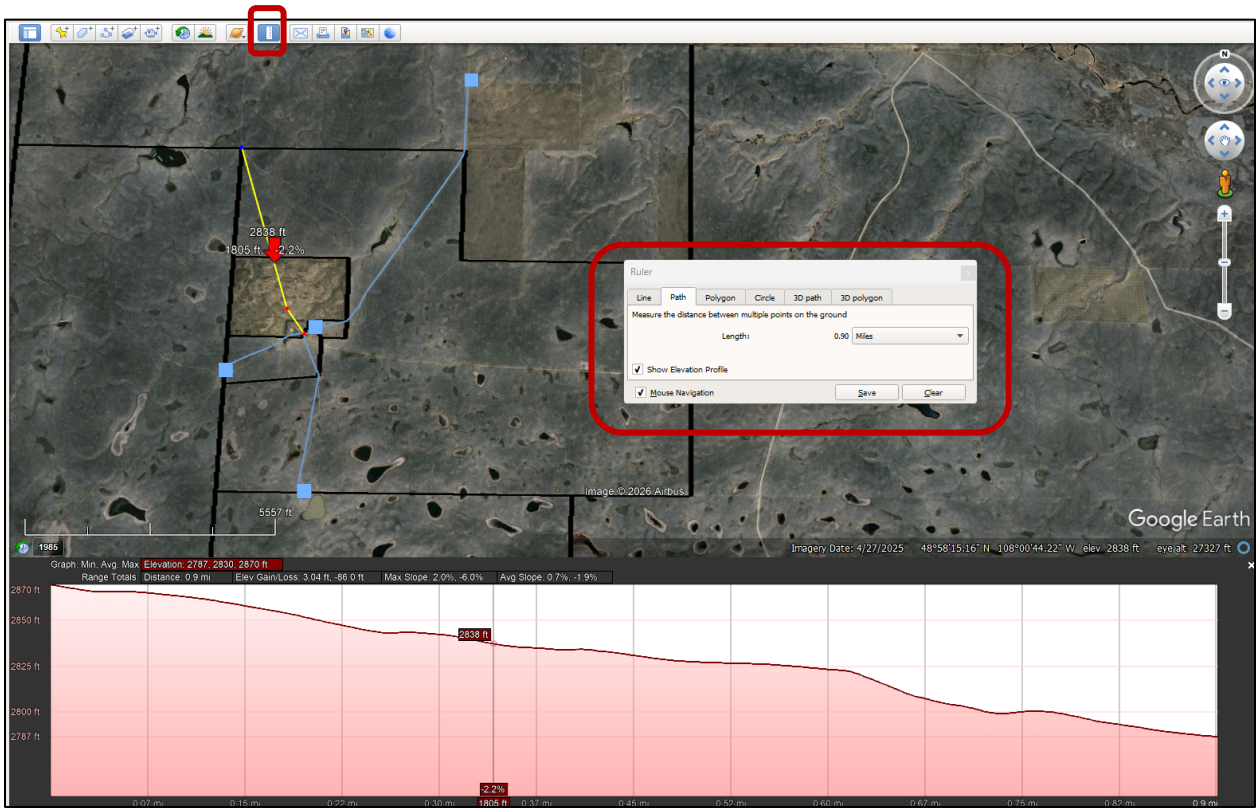


Figure 15: Advanced Measurement Tools. The Ruler tool allows you to make high-accuracy measurements that consider elevation profiles such as the 3D ground surface. The Path tool under the Ruler tool can be helpful for infrastructure planning purposes such as extending a pipeline to another area of a pasture.

2. 3D Interface

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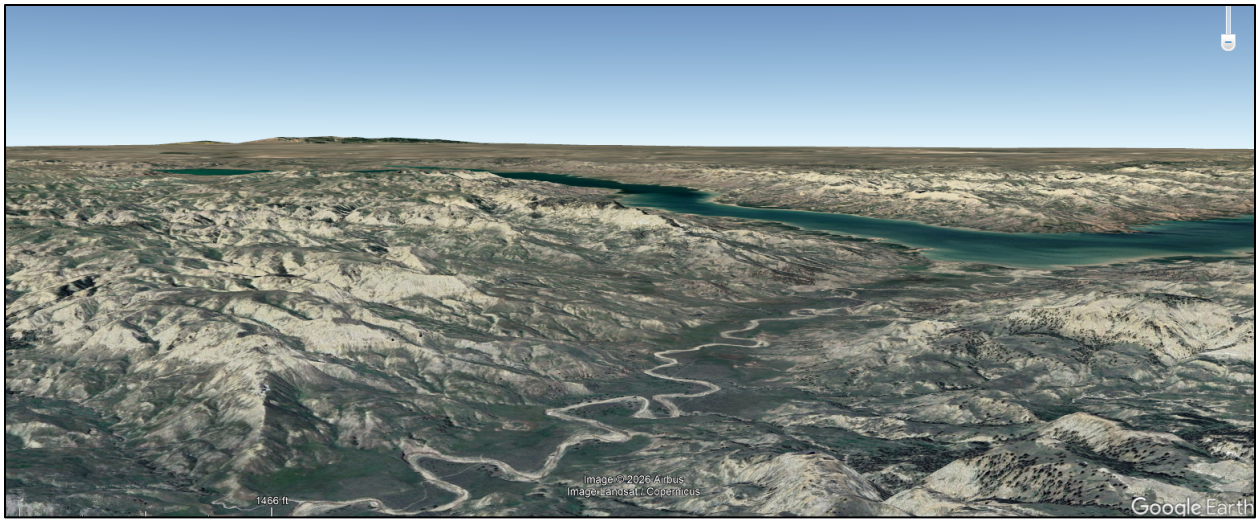


Figure 16: 3D interface in Google Earth Pro. This feature allows you to explore terrain and elevation, which is often not shown clearly on 2D maps.

3. Historical Imagery

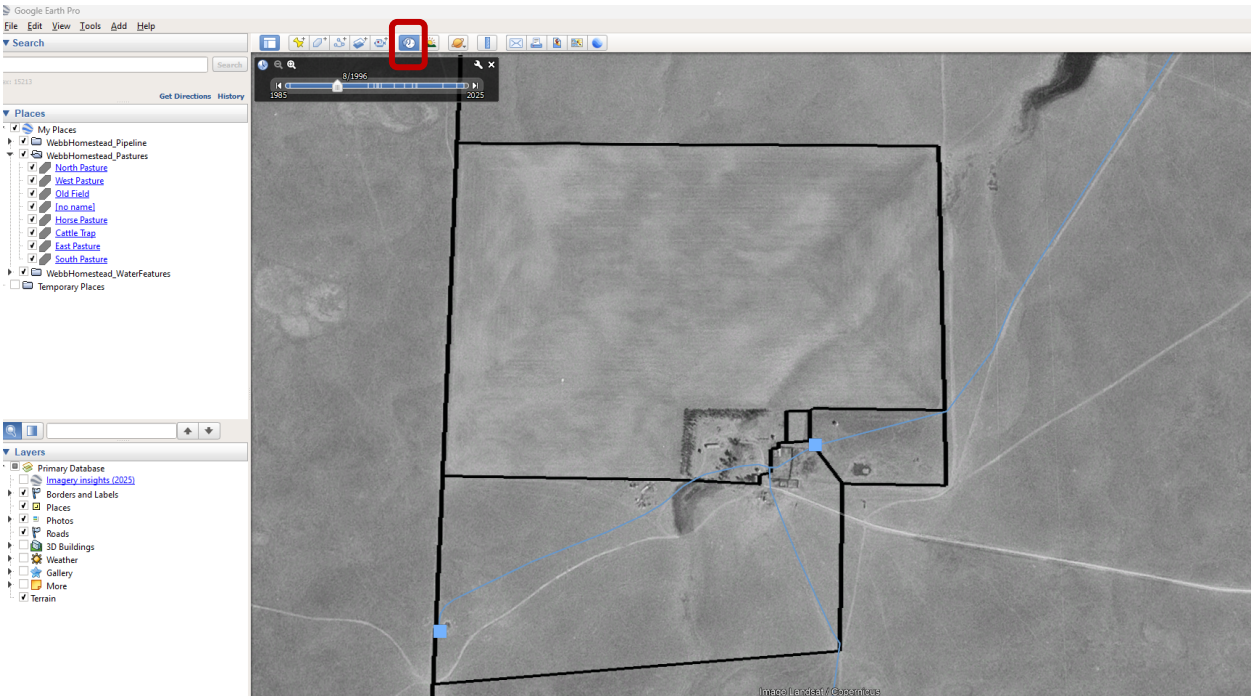


Figure 17: The historical imagery tool. The historical imagery tool is located on the tools bar at the top of your screen, and it allows you to observe past imagery.

4. Printing a Map

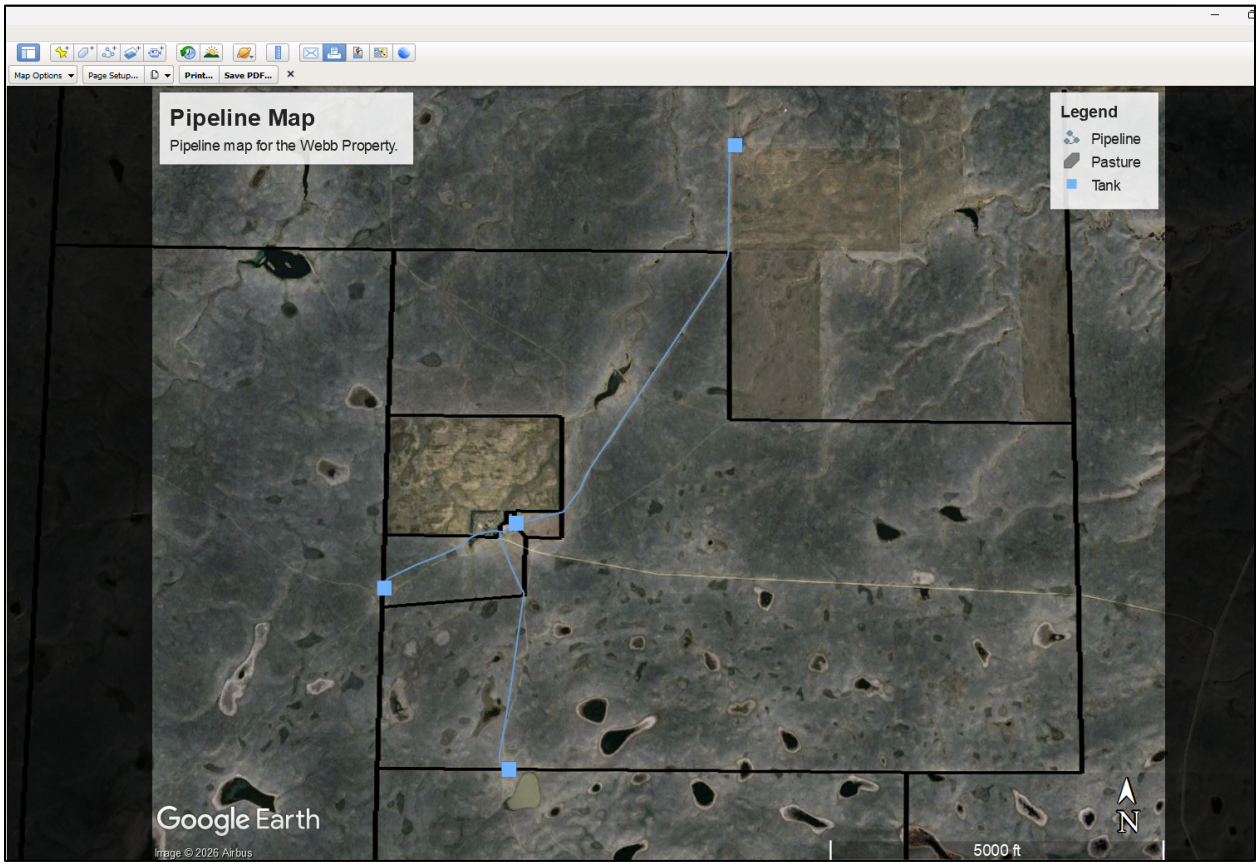


Figure 18: The print map tool. This tool allows you to create map layouts and print or save them as a PDF. You can edit the name, description, and legend.

5. Importing a Shapefile/ Raster Data

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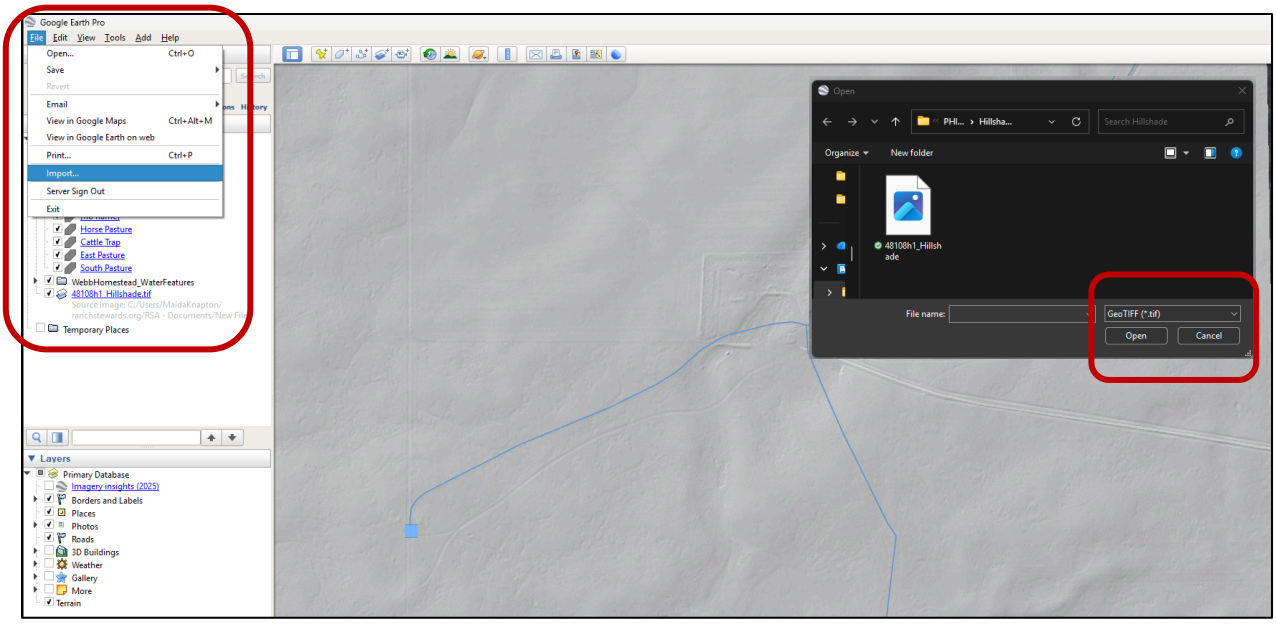


Figure 19: Importing data into Google Earth Pro. To import additional data into Google Earth Pro such as KML/KMZ, shapefiles, or raster data, click the file tab and select import. This will pull up your file system, where you will have to specify what type of file you want to import, and then you can select your file.

The example I used in this image is LiDAR raster data, which is a high accuracy elevation map.

V. The Benefit of Utilizing Artificial Intelligence to Problem Solve

Artificial Intelligence (AI) can be a helpful tool for problem solving when using mapping applications. AI platforms allow you to describe a scenario you are facing and ask for a solution, which helps to streamline learning and progress when working new programs. The solutions AI platforms offer to a posed question give step by step instructions to solve problems like how to access a tool, or how to draw a polygon. Some AI platforms like **ChatGPT** can be open source and require no login credentials to use the application.

Here is the link to ChatGPT