

Georectification with Mapwarper

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For additional resources and tutorials, visit www.usmcdh.org

Overview:

Digital mapping is the process of producing digital representations of space and cartography through the collection of geospatial data. It can be a web-based map (such as Google Maps), or built using local software (including GIS). It is closely linked with *geospatial analysis*, which involves the interpretation of different forms of geographic information to understand how people, goods, ideas, and events interacted within space, as well as modeling trends and patterns between places.

Georectification refers to the process of taking a *high resolution* image (usually a map, but can be anything—a painting, a fictional map, etc.), and referencing it to a spatial grid using longitudinal and latitudinal coordinates. Once referenced, the image can be used as a *layer* in other maps, such as *OpenStreetMap*, *Mapbox*, or *Google Maps*.

Challenges with digital mapping:

1. A map is a representation of space created by humans; it is neither absolute nor stable
2. Space changes over time (natural and political space is constantly changing)
3. Space is contentious
4. Space is sacred
5. Space is sensitive
6. Space is power

This guide covers how to georectify a historical map using Map Warper, a free and open source tool for georectifying images and maps. This tool works well for a classroom

assignment, because it does not require students to install any software. Map Warper is free to use, but your maps will be publicly accessible. Please consider the sensitivity of your data and confirm the rights and permissions prior to using Map Warper.

Where to Find Maps

The only requirement for georectification is that your image must be as high-resolution as possible. This means downloading a TIFF file (preferred), or a PNG file. Here are some links to sites with high resolution maps:

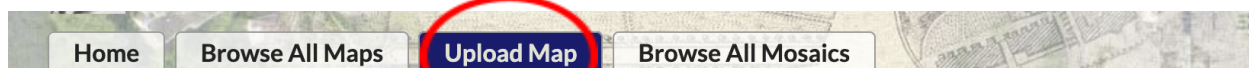
- [David Rumsey Map Collection](#)
- [New York Public Library Map Division](#)
- [Newberry Library Fire Insurance Maps](#)
 - [Library of Congress Fire Insurance Maps](#)
- [Library of Congress Online Collections](#)
- [Digital Public Library of America](#)
- [The Newberry Library Internet Archive](#)

Creating a Map Warper Account

1. Go to: <https://mapwarper.net/>
2. Click on the **Create Account** button in the top right corner
3. Enter your name, email, and password to sign up for free.
4. Login to access the dashboard

Upload your Map Image

1. Select the tab “Upload Map” from the top menu
2. A new page will open where you can enter the title, description, and other relevant metadata about your map. Refer to the digital repository where you found your map.
3. Upload your map using the **choose file** button at the bottom of the page.



Home > Maps

Upload a new map

By uploading images to the website, you agree that you have permission to do so, and accept that anyone else can print and use them, including changing control points.

Title

Illinois, Galesburg Quadrangle

Description (max 256 chars)

surveyed in 1924-1925, map in color depicting Galesburg and surrounding areas.

Issue Year (year, optional)

Used to display maps by year.

2023

Tags (comma separated)

Is a map

Subject Area (optional)

Galesburg, IL

Metadata Unique ID (optional)

Source / Bibliographic Ref URL (optional)

https://digital.library.illinois.edu/items

Call Number (optional)

G3700s.C2 1882 .U5

Publisher (optional)

University of Illinois Library Digital Collection

Place of Publication (optional)

Author(s) (optional)

U.S. Geological Survey

Date Depicted (year, optional)

1927

Published Date (optional)

1927

Reprint Date (optional)

Scale (optional)

1:62,500

Metadata Projection (optional)

Metadata Locations (optional)

Lat:

Lon:

Upload An Image File:

Choose File

Galesburg.tif

OR

4. Click **Create** at the bottom of the page. The page may take a few minutes to load. If you get an error message, try going back to the **Home** tab and see if your map is there.
5. After successfully uploading your map, the page will refresh and you will be able to view it and georectify it.

Georectifying your Map

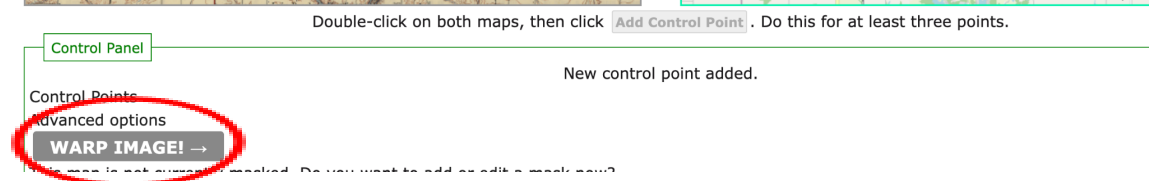
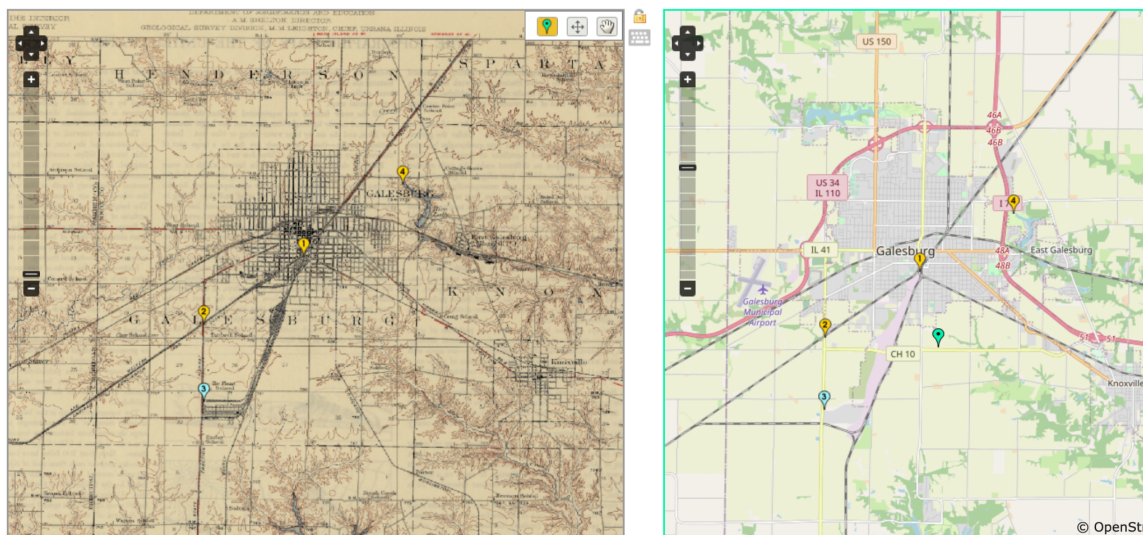
1. Select the **Rectify** tab from the top menu of the screen. This will divide the page between your map image and a web mapping base layer.

The screenshot shows the Map Warper web application. At the top, there's a navigation bar with tabs like Home, Browse All Maps, Browse Rectified Maps, Find Maps by Location, Upload Map, Browse All Mosaics, Find Mosaics by Location, Add Mosaic, About, and Help. The main content area is titled 'Illinois, Galesburg Quadrangle' and shows a historical map on the left and a modern OpenStreetMap base layer on the right. A 'Control Panel' at the bottom indicates the next step: 'Double-click on both maps, then click Add Control Point. Do this for at least three points.'

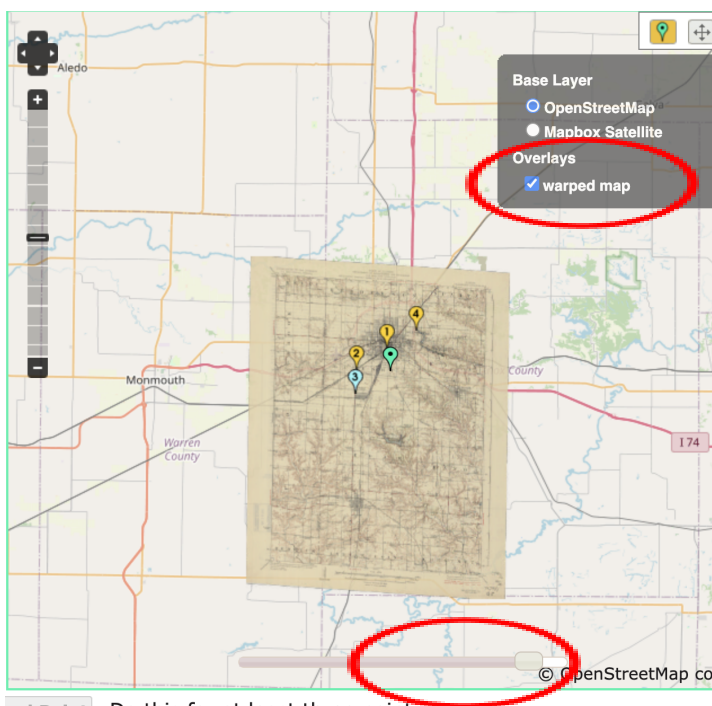
2. In the top right corner of each map, you will see three options: **pin control point**, **drag control point**, and **grabber** buttons.
3. Select the **pin control point option** and place a pin on both your map image and the web map. Try to make these points as accurate as possible— you may need to zoom into the maps to align them perfectly.
4. Select the **Add Control Point** button at the bottom of the two maps.
5. Repeat this process for every new set of pins you add to the map. Work your way towards the map's corners to make sure you are referencing all portions of your map. If you need to move around the map, select the **grabber** option first.

NOTE: Map Warper says to repeat this process for at least three points, however, you will probably end up with 12-15 points to make your map georectify properly.

6. Select the **WARP IMAGE** button when you are ready to warp the map and see how your points are aligning. You can do this at any point.



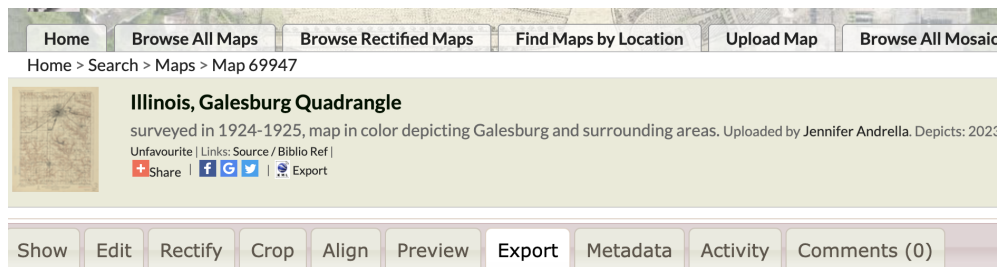
7. You will now be able to see a partially transparent image of your map projected onto the web mapping layer!



8. Continue to add more control points until you are happy with the appearance of your map. You can toggle the overlays by un-checking the **warped map** box from the gray menu in the upper right corner of the warped map section.
 - a. Three rules for strong results:
 - i. Add more points
 - ii. Add points farther apart
 - iii. Use more corners/edges, if possible.
9. You may also change the transparency of the image **using the slider** at the bottom of the warped map section.
10. Remember to select **Warp Image** after adding more pins to your map.

Previewing and Exporting your Map

11. To preview your finished map, select the **Preview Tab** from the top menu. If you are planning to download a still image of your georectified map, set your transparency to the desired setting.
12. To export your finished map, select the **Export Tab** to see your exporting options. To download a still image, select the **Download rectified PNG** option from the list.



Export

Images

GeoTiff: Download rectified GeoTiff

PNG: Download rectified PNG (and associated .aux.xml file .aux.xml)

Map Services

KML: Download KML file (for use in Google Earth, etc)

WMS: WMS Capabilities URL (for JOSM OpenStreetMap Editor)

Tiles (Google/OSM scheme): <https://mapwarper.net/maps/tile/69947/{z}/{x}/{y}.png>

Bibliographic Links:

Bibliographic

Ground Control Points

CSV: Download control points as CSV

NOTE: there are additional options for exporting your map to use in other mapping applications and services. If you are building your own website, using Neatline in Omeka, or using a platform like QGIS or Leaflet, you can import your georectified map as a layer into your project. If you are interested in this type of project, contact Jen Andrella for more information and resources!