<mark>GeoJPG</mark> - Offline Web Maps
That Display GIS Data
Using Georeferenced JPGs

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April 10, 2022 update. Currently the production code for GeoJPG is version 1.056. GeoJPG version 2 will be released this spring or early summer. There will be significant changes to the interface that will make it much easier for anyone to use their own georeferenced JPGs. This next version of GeoJPG will be released together with GISsurfer version 3. That version of GISsurfer will let anyone make georeferenced JPGs that can show almost any GIS data and that can be displayed offline with GeoJPG.

<mark>GeoJpg</mark> is a pilot project to demonstrate <mark>GIS maps that work *offline* in your browser</mark>. Each map that has been produced is a georeferenced JPG image that was made entirely from government GIS data. Most of these maps cover 300 + square miles and cover a large portion of the Washington State Cascade Mountains. This mapping technique can display offline almost *any* data that is hosted on an ArcGIS server.

Over the last few years most browsers have added features that allow webpages with special coding to work offline. Such webpages are known as **Progressive Web Apps (PWA)**. A webpage coded as a PWA can work offline in the user's browser because the files for that webpage are saved on the user's device in a special browser cache. Each PWA maintains its own browser cache that only has the files for that PWA. Of course the first time the user visits the PWA webpage the user must be online since the files for the webpage need to be downloaded from the hosting server.

<mark>GeoJPG is a webpage that is a Progressive Web App (PWA).</mark> It is built using the free open-source Leaflet map API and JavaScript. It uses 'service worker' coding to identify the files that will be saved in a special browser cache. And since GeoJPG is a webpage, it works fine on both **iOS and Android** devices.

There are two different GeoJPG links.

1. **https://geojpg.com/homepage**
This is the homepage with documentation. This is *not* the PWA.

2. **https://geojpg.com/worker/p/geojpg.html**
This is the PWA. For the <mark>installation instructions</mark> please open the homepage and tap "Website Menu" and then tap the choice for the installation instructions.

A unique feature of GeoJPG is the **georeferenced JPG** images that it displays. Think of each JPG as a very large map tile. Below is a description of how these JPG images are made using **100% government GIS data**.

GISsurfer (I am the developer) is a general purpose web map that is also based on the Leaflet map API. It has broad support for displaying data that is hosted on GIS servers. Anyone can use GISsurfer for any non-commercial purpose. To learn how to 'surf' and display data that is hosted on ArcGIS servers, open the GISsurfer homepage at **https://gissurfer.com** and then click **Menu > Help**. Look under the heading "2. Tips for surfing GIS servers" for a link to a PDF file.

Here is a **GISsurfer map link** that displays the **basemap FSTopo** which is maintained by the U.S. Forest Service. When the map opens it shows part of the Mt. Baker Snoqualmie National Forest east of Seattle. This basemap has similar detail for all national forests. Outside of the national forest areas, this basemap has little-to-no detail.
https://mappingsupport.com/p2/gissurfer.php?center=47.426434,-121.548099&zoom=14&basemap=FSTopo

Next is a **GISsurfer map link** that shows the FSTopo basemap plus **16 overlays of GIS data** from various government ArcGIS servers. This is the GIS data that was used to produce most of the georeferenced JPG images.
https://mappingsupport.com/p2/gissurfer.php?center=47.426434,-121.548099&zoom=14&basemap=FS_topo&overlay=2016_tree_cover,USA_main_contour_lines,Lake_river_stream,Proclaimed_forest,Old_road_status_unknown,WA_trails_1,WA_trails_2,WA_trails_3,USFS_trail_green,USFS_trail_black,DNR_major/forest_road,USFS_motor_road_open,USFS_motor_road/trail_MVUM,USFS_motor_road/trail_type,USFS_motor_road_closed,Landform_names,Medical_fire_police,USFS_recreation_site&data=https://geojpg.com/worker/p/map/WA/WA_USGS_topo.txt

When GISsurfer version 3 is released sometime in 2022 it will include a new feature that lets the user shift the screen *exactly* one screen worth up/down/left/right. This works on any device from cell phones to desktops. When GISsurfer is in that mode, all controls around the edge of the screen are removed. The screen is 100% map - nothing else. The user can take a series of screenshots that exactly adjoin. At the end of that process the highest/lowest latitude/longitude are displayed. This is the **georeference data** for that series of screenshots.

Most of the georeferenced JPG images are 24 or 25 screenshots. And because the screenshots exactly adjoin, stitching them together in photoshop is super easy.

The Leaflet map API (as well as other map APIs) has a feature that will display an image as an overlay on the map if you provide the latitude and longitude (i.e. georeference data) for the four edges of the image. Here is a **GISsurfer map link** that displays (1) the FSTopo basemap and (2) one of the large georeferenced JPGs on top of that basemap. The map opens showing an edge of the JPG. If you zoom out eventually all of the JPG will be on your screen.

https://mappingsupport.com/p2/gissurfer.php?center=47.395004,-121.356525&zoom=14&basemap=FSTopo&data=jpg=https://live.staticflickr.com/65535/51654965965_32ebb2949c_o_d.jpg^georeference=47.386902,-121.761646,47.624562,-121.322193

If you install the GeoJPG PWA and one or more maps, then when you are offline and open the PWA, you will see (1) the map(s) you installed and (2) a blank basemap. **Tip:** When your phone is in airplane mode it is offline.