

GISsurfer

Data Parameter

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This PDF file is online at
<https://mappingsupport.com/p2/help/GISsurfer-data-parameter.pdf>

The GISsurfer homepage is at
<https://gissurfer.com>

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1. Introduction

The **data parameter** is what gives GISsurfer most of its ability to display useful information. When a GISsurfer map link does not include a data parameter then the only information the map can display about an area is whatever information is part of the built-in basemaps and built-in overlays.

The data parameter is used to display:

- Map title
- Lines with various colors and widths
- Markers
- GIS basemaps (in addition to the built-in basemaps)
- GIS overlays (in addition to the built-in overlays)
- Georeferenced JPG images
- Track data from GPX files with various colors and widths

More features are planned for the data parameter.

Important: When the data parameter is used it must be the **last parameter** in the GISsurfer map link.

The data parameter replaces the &inline, &txtfile and &textfile parameters. Existing GISsurfer links that use those parameters should continue to work but new GISsurfer links should use the data parameter instead

If you need help using GISsurfer, please visit <https://gissurfer.com>. The detailed documentation is in a series of PDF files on the “Help” page.

2. Display markers

Here is a GISsurfer map link that uses the data parameter to display several markers on the map.

<https://mappingsupport.com/p2/gissurfer.php?data=37.370497,-121.936912||37.619431,-122.373877||37.717829,-122.222385||37.658472,-122.120933||37.512784,-122.250023||37.460929,-122.14239>

Note the two vertical lines after each coordinate. That symbol is an uppercase character on the righthand side of a keyboard. Think of that as an **end-of-line** or **line break** indicator. More on that a bit later in this PDF file.

Since the above map link does not have a basemap parameter, the **default ‘USA basemap’** is displayed.

Also since the above map link does not have a center parameter and zoom parameter, the map is **automatically centered and zoomed** such that all of the markers are on the user’s screen.

A future update to GISsurfer will add various features to markers such as titles, descriptions, different colors, custom symbols, etc.

3. Display lines

Here is a GISsurfer map link that uses the data parameter to draw a line on the screen.

<https://mappingsupport.com/p2/gissurfer.php?data=line=on||45.525032,-122.687062||45.525123,-122.681236||45.522020,-122.681081||45.521345,-122.678543||45.517334,-122.680673||45.515458,-122.673587>

Just like the earlier map that showed markers, the default basemap is used and the map is **automatically centered and zoomed** such that all of the line is on the user's screen.

To turn on the line drawing feature use the command **line=on**.

To turn off the line drawing feature use the command **line=off**.

By default lines are red and two pixels wide. In other words, the command

```
line=on
```

is the same as the command

```
line=on^color=ff0000^width=2
```

Note the caret ^ symbol. Think of that symbol as separating pieces of information. The || symbol and the ^ symbol are **delimiters**. In other words, **the data parameter displays delimited data**.

The value for color is an RGB (Red Green Blue) code. For pure green the RGB code is 00ff00. For pure blue the code is 0000ff. There are many online color picking tools. Here is one that does not have a bunch of ads. <https://colorpicker.me> To learn more you could do a google search on: RGB color.

If you change the line color and/or width, then those new settings become the default for the current map. For example, the following map has three lines. The first line uses the default style. The second line changes the style to blue and 4 pixels wide. The third line uses the revised style.

<https://mappingsupport.com/p2/gissurfer.php?data=line=on||47.611466,-122.342377||45.523480,-122.654800||47.657694,-117.422218||line=off||line=on^color=0000ff^width=4||47.428654,-121.420212||46.228872,-119.099007||line=off||line=on||47.657694,-117.422218||47.020300,-122.906799>

As in the earlier examples, the default basemap is used and the map is automatically centered and zoomed such that all of the data appears on the user's screen.

4. TXT files

Including the content for the data parameter right in the GISsurfer map link is a fast way to quickly produce map links. However, the resulting GISsurfer link can quickly become quite long. This is particularly true when you are using the data parameter to specify multiple GIS overlay layers and/or basemaps. The solution is to put the contents for the data parameter into a TXT file, put the TXT file online and then point the data parameter at the TXT file. **Another section of this PDF file has step-by-step instructions showing how to use Google Drive to host TXT files for free.**

Below is a GISsurfer link that uses the data parameter to point to a TXT file that is online. This map can display more than 20 GIS overlay layers related to weather. To see the list of GIS overlay layers that you can turn on/off/restack, click the basemap button and then look under the "Overlay" heading. Mobile users will need to scroll down. If all these GIS overlay layers were directly specified by the data parameter, imagine the length of the resulting map link.

https://mappingsupport.com/p2/gissurfer.php?center=34.884782,-98.525391&zoom=4&basemap=USA_basemap&overlay=State_boundary,Weather_watch_warning&data=https://mappingsupport.com/p2/special_maps/disaster/USA_rain_flood.txt

There are three steps for using a TXT file to hold content for the data parameter.

1. Put the content for the data parameter into a TXT file.
2. Put the TXT file online. **Google Drive will host your TXT files for free.**
3. Make a GISsurfer map link with the data parameter set to the address for the TXT file.

Anything you can specify directly with the data parameter you can also specify with a TXT file.

For example, the prior section of this PDF showed a GISsurfer link with three lines. Below is the content of a TXT file that contains that same data. Now you see why the || symbol can be thought of as an end-of-line indicator.

```
line=on
47.611466,-122.342377
45.523480,-122.654800
47.657694,-117.422218
line=off
line=on^color=0000ff^width=4
47.428654,-121.420212
46.228872,-119.099007
line=off
line=on
47.657694,-117.422218
47.020300,-122.906799
```

Since that TXT file is online on Google Drive we can make a map link with the data parameter pointing to that TXT file. Again, step-by-step instructions for hosting TXT files for free on Google Drive are in another section of this PDF file.

https://mappingsupport.com/p2/gissurfer.php?data=file_name.txt^https://drive.google.com/uc?id=1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX

The data parameter can also be used to specify both one or more TXT files together with content specified in the map link. The following map displays the same three lines plus two markers. Note that since the TXT file (see content shown above) left line drawing ‘on’ it is necessary to turn line drawing ‘off’ in order to display markers instead of extending the third line.

<https://mappingsupport.com/p2/gissurfer.php?data=filename.txt^https://drive.google.com/uc?id=1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX||line=off|46.853130,-121.760101||46.202533,-121.490593>

The data parameter can have **multiple TXT files**. Remember to use the || delimiter after each TXT file address.

You can also **nest TXT files**. This is a handy technique to use when you want to make several different maps where each one has both some unique GIS layers and some common GIS layers. Put the GIS layer specifications that are common to all the maps into a TXT file and put that TXT file online. Then in the **TXT file for each map** include the GIS layer specifications for the unique GIS layers that map can display and also include the address for the TXT file with the specifications for the GIS layers that are common to all the maps. Note that TXT file nesting is only supported for **one layer deep**.

To include a **comment** in a TXT file start the line with **//**. You can also include blank lines in a TXT file. Comments in TXT files can help you stay organized and blank lines can improve readability.

5. Display map title

Here is a GISsurfer map link that uses the data parameter to display a title on the map.

<https://mappingsupport.com/p2/gissurfer.php?data=title=Bandera mountain||https://mappingsupport.com/gpx/Bandera.gpx>

To display a title in the upper left corner of the map include the command **title=_____** as part of the data parameter. If the title is directly part of the data parameter as in the example above, then use an **underline character** in place of any spaces in the title. The ** ** you see in the title are html commands that make the title appear in bold type. Note the end-of-line delimiter **||** after the title.

Use **
** to make a multi-line title. For example:

<https://mappingsupport.com/p2/gissurfer.php?data=title=Bandera
Mountain||https://mappingsupport.com/gpx/Bandera.gpx>

Alternatively, you could put the title in a TXT file. If you do that then it is not necessary to use an underline character instead of a space.

6. Display data hosted on ArcGIS servers

Government agencies at all levels, from local to federal, are hosting data on ArcGIS servers. **GISsurfer provides a super easy way for anyone to make their own custom interactive maps to display data that is hosted on those servers.**

Here is a GISsurfer map link centered on Florida that uses the data parameter to display an ArcGIS layer that shows weather stations. To see the **most current weather observations**, zoom in and click a red star. You will see a popup with all the **attribute data** the ArcGIS server has for that weather station. Click the link in the popup.

https://mappingsupport.com/p2/gissurfer.php?center=27.382629,-81.540527&zoom=6&basemap=ESRI_National_Geographic&overlay=Weather_station&data=overlay^name=Weather_station^url=https://nowcoast.noaa.gov/arcgis/rest/services/nowcoast/obs_meteoceanhydro_insitu_pts_geolinks/MapServer^layers=1

This GISsurfer map link uses the following five parameters.

| | |
|---------|--|
| center | Center of the map when it opens |
| zoom | Zoom level when the map opens |
| basemap | Basemap to display |
| overlay | Name of any GIS overlay layer that will be ‘on’ when the map opens. Note that an underline character is used instead of a space. |
| data | Specification for an ArcGIS layer |

The specification for the GIS layer has the following parts separated by the caret ^ symbol.

| | |
|---------|---|
| overlay | This value must be “overlay” or “basemap” |
| name | You make up a descriptive name. Use this same name in the ‘overlay’ parameter in the map link. |
| url | Address on the ArcGIS server |
| layers | Layer number on the ArcGIS server |

ArcGIS servers have a table on contents that consists of a series of web pages. The top of the table of contents always has an internet address that ends in “rest/services”. Here is the table of contents page that is used in the above GISsurfer map link.

https://nowcoast.noaa.gov/arcgis/rest/services/nowcoast/obs_meteoceanhydro_insitu_pts_geolinks/MapServer

If you open the above link you will see a lot of metadata. Scroll down to the section titled “Layers:”. Here you see the **layer numbers** that are used in a GISsurfer map link to display the data. The layer names here are merely descriptive. You are not required to use the same names in a GISsurfer map link. **It is the layer number that is important, not the layer name.**

To help you find the internet address for government ArcGIS servers, here is a PDF file with a curated list of well over 3,000 government ArcGIS server addresses. The list is updated once per week and any dead links are fixed or flagged.

https://mappingsupport.com/p/surf_gis/list-federal-state-county-city-GIS-servers.pdf

Tips: A **Google advanced search** can help you locate data layers on an ArcGIS server. Here is an ArcGIS server operated by the State of Washington.

<https://gismanager.rco.wa.gov/arcgis/rest/services>

To search that server for data related to trails, enter the following as a google search. The ‘site’ keyword limits your search to just that ArcGIS server.

trails **site:**<https://gismanager.rco.wa.gov/arcgis/rest/services>

A fast way to actually look at data on an ArcGIS server is to ‘**surf**’ that data with GISsurfer. Click the basemap button and then look under the “Overlay” heading. Mobile users might need

to scroll down. Click “Add GIS overlays”. Paste in the address for an ArcGIS server and then click “Send request to GIS server”.

The left side of your screen will display a page from the table of contents of that ArcGIS server. The right side of the screen displays the map. Drill down on the table of contents until you get to a layer you want to display. Click that layer in the table of contents and that data appears on the screen. Here is a PDF file with more information on how to use GISsurfer to ‘surf’ the data hosted on an ArcGIS server.

<https://mappingsupport.com/p2/help/GISSurfer-surfing-tips.pdf>

Tip: Use the ‘surfing’ feature to display GIS data on the map then click **Menu** ==> **Link to this map**. GISsurfer makes the **data** parameter for you and displays a link that will replicate the map on your screen including the GIS data.

An ArcGIS server can have several different types of data. GISsurfer can display data that is hosted as **MapServer**, **FeatureServer** or **ImageServer** data. To determine the data type you need to look at the address of the data on the ArcGIS server. Scroll back up in this PDF file and look at the weather station map link. Note that the map is displaying **MapServer** data.

The syntax for making a GISsurfer map link is the same except as follows:

- * **MapServer** specifications can use multiple layer numbers. For example, assuming these layer numbers exist at the same address on the ArcGIS server, the following are all valid.
 - ^layers=3
 - ^layers=3,4,5,6
 - ^layers=3-6
 - ^layers=2,8,11-13
- * **FeatureServer** specifications only use a single layer number.
- * **ImageServer** specifications do not use layer numbers.

Here is a map that displays **FeatureServer** data showing recent wind reports. Click any symbol for details.

https://mappingsupport.com/p2/gissurfer.php?center=36.985003,-100.019531&zoom=4&basemap=USA_basemap&overlay=Wind_report_last_24hrs&data=overlay^name=Wind_report_last_24hrs^url=https://services9.arcgis.com/RHVPKKiFTONKtxq3/arcgis/rest/services/NOAA_storm_reports_v1/FeatureServer^layers=2

And below is a map displaying **ImageServer** data consisting of aerial photos for the State of Maryland. Note that there is no layer number. Also note that the map link specifies this data as a ‘basemap’ instead of an ‘overlay’. And since this basemap is ‘on’ when the map opens, the map will display the Maryland aerial photos and the rest of the map will be blank.

It might take a few seconds for this map to open.

https://mappingsupport.com/p2/gissurfer.php?center=39.023306,-77.628786&zoom=7&basemap=Maryland_aerial&data=basemap^name=Maryland_aerial^url=https://geodata.md.gov/imap/rest/services/Imagery/MD_SixInchImagery/ImageServer

The following map link shows how to make an overlay layer **semi-transparent**. This map uses the FSTopo basemap which does not show tree cover. The map also displays some GIS layers that are specified in a TXT file and displays the federal NAIP aerials.

This first link displays the NAIP aerials with **no transparency**. Since this overlay is 'on top' it completely hides the basemap and the other overlays.

https://mappingsupport.com/p2/gissurfer.php?center=47.428227,-121.421757&zoom=14&basemap=FSTopo&overlay=USA_main_contour_lines,Landform_names,USFS_recreation_site,Aerial_NAIP&data=https://mappingsupport.com/p2/recreation/USFS_recreation.txt||overlay^name=Aerial_NAIP^url=https://gis.apfo.usda.gov/arcgis/rest/services/NAIP/USDA_CONUS_PRIME/ImageServer

For this second link the aerials are made **semi-transparent** so that the basemap and other GIS overlays are also visible.

https://mappingsupport.com/p2/gissurfer.php?center=47.428227,-121.421757&zoom=14&basemap=FSTopo&overlay=USA_main_contour_lines,Landform_names,USFS_recreation_site,Aerial_NAIP&data=https://mappingsupport.com/p2/recreation/USFS_recreation.txt||overlay^name=Aerial_NAIP^url=https://gis.apfo.usda.gov/arcgis/rest/services/NAIP/USDA_CONUS_PRIME/ImageServer^opacity=0.35

7. Display data hosted on ArcGIS servers - Advanced Tips

Many ArcGIS MapServer layers support a feature called **dynamic layers**. This feature allows GISsurfer to tell the server to **restyle the data** before delivering the data to the map. You can change line color, line width, polygon fill, labels and more.

You can also make a GISsurfer map link that only displays **part of a data layer**. You can do this for both MapServer and FeatureServer data.

These advanced techniques are covered in the following PDF file along with plenty of examples. <https://mappingsupport.com/p2/help/GISSurfer-advanced-arcgis-tips.pdf>

8. Display data hosted on WMS servers

Here is a GISsurfer map link that uses the data parameter to display a layer from a WMS server that highlights state lines.

https://mappingsupport.com/p2/gissurfer.php?center=39.067454,-96.416016&zoom=4&basemap=USA_basemap&overlay=States&data=overlay^name=States^url=https://tigerweb.geo.census.gov/arcgis/services/TIGERweb/tigerWMS_Current/MapServer/WMServer^layers=States

If the WMS server does not use version 1.1.1 then you will need to add the version number to the data specification. For example: ^version=1.3.0

Note that WMS servers use layer **names** instead of layer numbers. And just to confuse things a bit, the layer name might be a number.

For the other default options for WMS servers, please open the following link to the WMS section of the Leaflet documentation. (Close the message that appears on the screen in order to see the documentation.)

<https://leafletjs.com/reference.html#tilelayer-wms>

9. Display data hosted on XYZ tile servers

Here is a GISsurfer map link that uses the data parameter to display an XYZ tile service that shows surface water in the USA. Zoom in for a lot more detail including intermittent streams.

https://mappingsupport.com/p2/gissurfer.php?center=39.197552,-96.679687&zoom=4&basemap=USA_imagery&overlay=All_stream_river_lake&data=overlay^name=All_stream_river_lake^url=https://basemap.nationalmap.gov/arcgis/rest/services/USGSHydroCached/MapServer/tile/{z}/{y}/{x}

If data on an ArcGIS server is ‘tiled’ then there are **two ways** to make a GISsurfer map link to display that data. You can either use the layer number syntax as shown in the prior section or you can use the tile syntax. **Using the tile syntax will usually display the data faster than using the layer number syntax.**

You can easily tell if data on an ArcGIS server can be displayed using the tile syntax. Here is the ArcGIS server’s table of contents page for the water data:

<https://basemap.nationalmap.gov/arcgis/rest/services/USGSHydroCached/MapServer>

Open the above link and note where it says:

Single Fused Map Cache: true

Tile Info: ...

That information indicates you should be able to use the tile syntax to display the data.

For example, here is the table of contents page for a basemap produced by the Oregon Department of Transportation.

https://gis.odot.state.or.us/arcgis1006/rest/services/basemaps/Basemap_Overlay_WM/MapServer

If you scroll past the list of layers you will see that it says “**Single Fused Map Cache: true**”.

Below is a GISsurfer link to display that basemap as tiles.

https://mappingsupport.com/p2/gissurfer.php?center=45.521864,-122.683639&zoom=12&basemap=Oregon&data=basemap^name=Oregon^url=https://gis.odot.state.or.us/arcgis1006/rest/services/basemaps/Basemap_Overlay_WM/MapServer/tile/{z}/{y}/{x}

Some non-ArcGIS tile servers reverse the order of the x and y components. So instead of {z}/{y}/{x} you would use {z}/{x}/{y}.

10. Display georeferenced JPG and PNG files

Here is a GISsurfer map link that uses the data parameter to display a georeferenced JPG.

https://mappingsupport.com/p2/gissurfer.php?data=Mason_Lake^https://mappingsupport.com/p2/kmz_demo/georeference_demo/Mason_Lake.jpg^47.394631,-121.605349,47.442195,-121.517458

The georeference data is the latitude longitude for the four edges of the image. **That data must start at the bottom edge and go around the JPG or PNG clockwise (bottom,left,top,right).**

A GISsurfer map can display multiple georeferenced JPG or PNG files. The specifications for the georeferenced images can either be in the map link as shown above or in a TXT file.

11. Display GPX files

Here is a GISsurfer map link that uses the data parameter to display the **track data** from a GPX file. The next section shows how you can **host your GPX files for free** on Google Drive.

https://mappingsupport.com/p2/gissurfer.php?basemap=USA_scanned_topo&data=https://mappingsupport.com/gpx/Bandera.gpx

Since there is no center and zoom parameters the map is automatically centered and zoomed so all the GPX track data appears on the user's screen.

Currently GISsurfer does not display GPX route or waypoint data.

To display data from multiple GPX files use an end-of-line indicator after each file.

https://mappingsupport.com/p2/gissurfer.php?data=https://__.gpx||https://__.gpx

You can also specify GPX files in a TXT file and then make a GISsurfer map link with the data parameter pointing to where the TXT file is online.

The GPX track will be displayed using the **default line style** which is red and two pixels wide. Here is an example of using the 'line' command to change the line style. One of the built-in overlays showing contour lines is also turned 'on'. Note the end-of-line indicator `||`.

https://mappingsupport.com/p2/gissurfer.php?basemap=USA_imagery&overlay=USA_main_contour_lines&data=line=on^color=ffff00^width=4|https://mappingsupport.com/gpx/Bandera.gpx

12. Display KML or KMZ files

GISsurfer does not presently support KML or KMZ files. Support for those file types might be added in a future update.

13. Free hosting for TXT and GPX files

You can host your TXT and GPX files for free on **Google drive** and use those files with GISsurfer. Note that I am **not** talking about "Google cloud" which is a different critter.

1. Sign in to Google drive

<https://drive.google.com/drive/my-drive>

2. Upload a TXT or GPX file

3. Right click the filename and select "Get link"

Change "Restricted" to "Anyone with the link"

Copy and save the link. Here is an example link for a TXT file.

<https://drive.google.com/file/d/1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX/view?usp=sharing>

4. Make a new link. Use the long string of gibberish.

<https://drive.google.com/uc?id=1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX>

If you paste the above link into a browser bar then you will either see the content of the TXT file or be able to download it.

5. Modify the new link you just made.

Use the link you made in step 4. Add a name that **you make up** and give it a value that ends in **.txt** (or ends in **.gpx**). Use an underline instead of a space. **It will likely help you stay organized if the name is the same as the file name you uploaded to Google Drive**, however that is not required.

[my_file_name.txt^https://drive.google.com/uc?id=1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX](https://drive.google.com/uc?id=1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX)

6. Make a GISsurfer map link with the data parameter set to the address for your file.

https://mappingsupport.com/p2/gissurfer.php?data=my_file_name.txt^https://drive.google.com/uc?id=1f0NTRx2IGD-DneP66a6TwTtzNrtVmRXX

Tip: If you are hosting .txt and .gpx files on a server where the link to the file ends in .txt or .gpx then you do not need a file_name. The file_name is only required when you host .txt or .gpx files someplace like Google Drive where the link to the file does not end in .txt or gpx. See the earlier sections in this PDF file showing how to use GISsurfer to display txt and gpx files.