

## Week 3 Cookbook

# Web Mapping Applications / Online GIS

### Week 3 Overview

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### **Web Mapping Applications: Using Google Maps as an Example**

This week we will explore Web Mapping Applications.

There are a lot of great web mapping application available for free, but this week we focus on just Google My Maps.

We tend to associate Google with fun - not work!

However, Google Earth, Google Maps, and the many other Web Mapping Applications available for free can be easily used for professional academic work.

This week you will learn how to create a custom map in Google My Maps, complete with imbedded photographs and YouTube videos. You will also perform simple quantitative analysis using Google My Maps.



*Consider printing this cookbook for your convenience!*

## 1) Google Maps, Google My Maps, and Google Earth

First, let's look at the differences between Google My Map and Google Earth

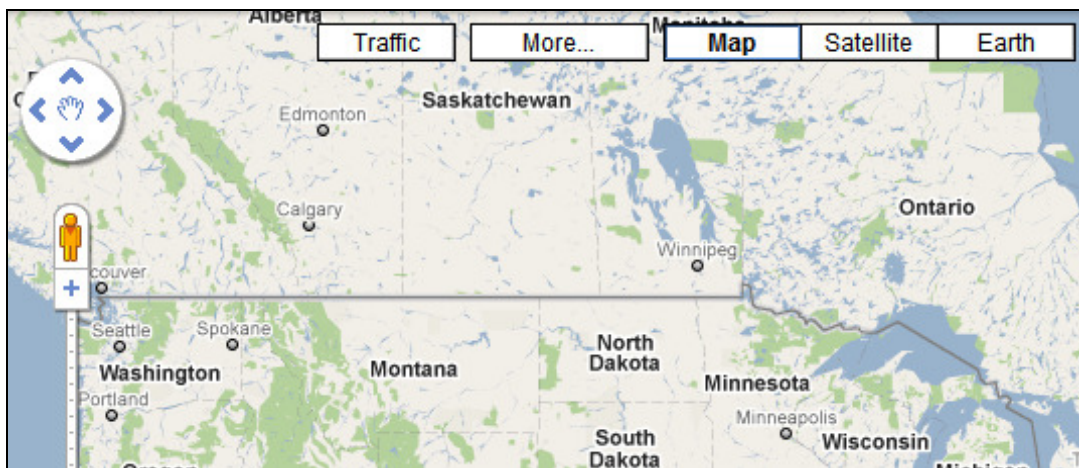
### **Google Maps**

Simpler  
Less features  
Online only!  
No software to download  
2D only

### **Google Earth**

More complex  
More features  
Create and share files  
Requires free software download  
3D

The last point (2D vs. 3D) is technically not the case anymore as Google Maps now displays 3D satellite imagery (click on the Earth button, see below), but you need to install a free browser plug-in.



- Google My Maps and Google Earth are compatible – you can create maps in one and use it in the other.
- Google Maps and Google Earth use the same image and street data.
- Google My Maps and Google Earth are 'free', but require a 'free' Google account to let you use the cool functions.

Now, 'free' is a relative term here. Google is a commercial company and makes money by selling advertisements. Google Earth is great, but not truly a Web Mapping Application since you need to download and install software.

**Google Maps** (<http://maps.google.com/maps>)

= *The passive side of Google Maps*



- Allows you to view the basic Google Map content.
- Search for addresses, businesses, places of interest, etc.
- Base maps: Traffic layer, Map layer, Satellite Layer, Terrain Layer, Earth Layer
- Street View by clicking on the orange person and dragging it around the map.

Type your home address into the search box – does Google Maps accurately find your house? In my case, Google Maps has the correct street, but places my house about 1,000 feet too far down the road!

**Google My Maps** (<http://maps.google.com/maps> and click on: My Maps)

= *The interactive side of Google Maps*

- Create your own content (= your own personal maps), complete with imbedded photographs and YouTube videos.
- Browse and use the interactive content created by others.
- Perform some basic quantitative analysis.
- Share your maps and content with others.

**Please note:** Google My Maps requires a free Google Account (see Section 2)

## **2) Create a Google Account**

Go to: <https://www.google.com/accounts/ManageAccount>

If you already have a Google Account: sign-in!

If not, click on *Create an account now* and follow the instructions to create a new account.

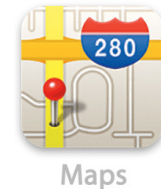
→ *You need a Google Account to complete this activity.*

Your Google Account gives you full access to all kinds of Google Services – the complete list with explanations can be found here: <http://www.google.com/intl/en/options/>

**We are using only two of the services:**

1) Google My Maps

<http://maps.google.com/maps>



2) Picasa Web Albums (= online photo album)

<http://picasaweb.google.com>

Upload your pictures and organize into albums.



→ *Google My Maps and Picasa Web Albums can be combined to create personalized maps.*

## **3) Google Resources**

Great tutorials for anything related to Google Maps, Google My Maps, and Google Earth.

Google Maps Support Center: <http://maps.google.com/support/>

Great Tutorials: <http://earth.google.com/outreach/tutorials.html>

Google Street View: <http://www.youtube.com/watch?v=f0y-q-pI2pQ>

YouTube Playlist for Google Maps (a great resource!)

[http://www.youtube.com/view\\_play\\_list?p=98DA918472BB3131](http://www.youtube.com/view_play_list?p=98DA918472BB3131)

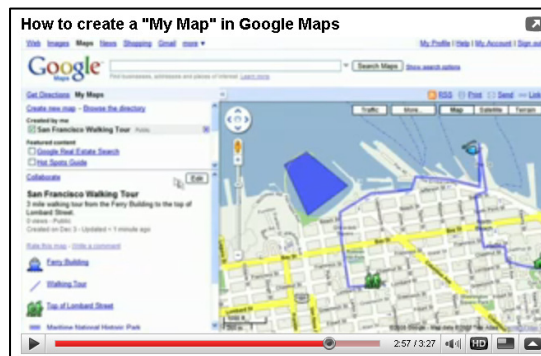
## 4) Watch This Video!

This YouTube video is a great start and tutorial– the author shows you how to make a custom map of a walking tour around San Francisco.

<http://www.youtube.com/watch?v=TftFnot5uXw>

Note that the author uses a slightly older version of Google My Maps, so the toolbar looks slightly different.

You also learn how to link pictures and YouTube videos to your own map (see Section 9 and 10).



Please watch this video carefully – repeat several times if needed – this is exactly what you need to know!

## 5) Create Your Own Map with Google My Maps

In Google Lingo, creating your own maps is called: Creating Content. So, let's create an original map.

1. Go to Google Maps, sign-into your Google Account, and select 'My Maps'.
2. Select 'Create new map'.
3. Enter a Title and a Description  
Select the Privacy settings (Public is the default) and click 'Save' and 'Done'.

Now you have created a blank map. Let's edit this map and add some original content. The new map is now listed under **Created by me** when you click on **My Maps**.

4. Click on the map and click on the Edit button – the editing toolbar is added to the screen. Zoom into the area where you want to create your map, for example your hometown or the college. Choose your background: Map, Satellite, or Earth.



5. Placemark Tool (blue ballon)  
Click on the tool and lick anywhere on the map to add a placemark. Enter a Title and a Description into the Dialog Box and click OK. You can also change the placemark symbol. Select OK when done.
6. Line Tool  
This tools has three options: draw a line, draw a line along roads, and draw a shape. Select the tool you want by clicking on the triangle and digitize a line or shape. Finish the line or shape by double-clicking, enter a Title and a Description in the Dialog Box. Then,

select the line and fill color and click OK when done. Note that the Line Tool shows you the length of the line as you digitize.

7. Edit and change your placemarks, lines, and shapes.  
Hover over the shape to show the nodes. Now you can drag and change each node. Note how the length of your digitized line changes as you move the nodes. Hover over the placemark to move it around. Hover over the shape and right-click to open the shape properties dialog box, add a node, etc.
8. When done, hit the Save to save your map and Done to exit the edit mode.

Note that your placemarks, lines, and shapes are also listed in the Table of Content pane to the left of the map, complete with your titles and descriptions.

➔ *The best thing now is to practice!*



Maps

## **6) Your Turn: Create a Map of Westfield State University**

To practice – create a map of Westfield State College.

- Add a few placemarks for the dorms.
- Draw a few lines, for example the walk from your dorm to Wilson Hall and 333.
- Draw a few shapes, for example South Lot and the football field.
- Try the **Draw a line along roads** tool and draw the drive from the college to downtown Westfield. Note that Google My Maps calculates the distance and the approximate time it takes for the drive – pretty cool!

The Week 3 folder contains all kinds of tutorial videos to help you creating your map. See also Section 3 and 4 of this cookbook.

## **7) Sharing Your Google My Maps**

Sharing your Google My Maps with the rest of the world is easy! You can use the Send or Link option provided in the upper right-hand corner of the map.

### **Send**

The Send option is self-explanatory: just enter the Email addresses and hit the Send button.

### **Link**

The Link option is even better: it provides you with a link that you can simply copy/paste into an Email or a discussion forum posting. It also provides you the HTML code if you want to embed your map in a website, a wiki, or a blog.

For Email and Discussion Forums: Simply copy/paste the link, here's how:

- Click on Link (upper right-hand corner of the screen)
- Single-click on the email or IM link (the one starting with [http://maps....](http://maps...))
- That will highlight the entire link in blue

Right-click, select copy, and paste the link into your Email.

Don't worry. The link is long and contains a bunch of weird characters...it's not supposed to make sense!

➔ *Send the link to yourself or to a friend to see how it works!*

## **8) Your Turn: Share Your Westfield State University Map in the Map Lounge**

Please take your map from Section 6 and share it with us in the Map Lounge as explained in Section 7. I'm looking forward to seeing your maps. Note: This is already part of the Week 3 Assignment.

## **9) Linking Photographs to Your Google My Maps**

As long as a photograph is available somewhere online...and is not 'blocked'...you can imbed it into your map. But, with those pictures you never know...they might disappear or they may be deleted at any time. It is always better to add your own pictures from Picasa Online (or any other web photo album).

Pay attention to the sequence and details...imbedding photographs can be a bit tricky at first!

### **9.1) Linking Photographs from Picasa Web Albums**

Please pay attention to the sequence and details...linking photographs can be a bit tricky at first!

1. Start a web browser and go to your Picasa Web Albums. Create an online photo album and upload a few pictures. This should be easy – check the help function if needed.
2. Single-click on a photo in a photo album.
3. Click on **Link to this Photo**.
4. First: **Select size** Small 288px or Medium 400px are best for Google My Maps. Always select the size you want first!
5. Click on the **Embed image** link (<table style="...") to highlight, right-click, and select copy.
6. Open a second browser, or a second browser tab. Go to the map you created in Section 6 and start editing the map.
7. Add a new placemark on your map and enter a title and description.
8. Then: select **Edit HTML**.
9. Paste the **Embed image link** from Picasa into the **Description** box and click OK.
10. Click Save, click Done  
Click on My Maps to refresh Google My Maps



11. Click on the placemark from Step 7 – the photograph should appear in the dialog box.

➔ *The best thing now is to practice! The sequence of steps is important here!*

## 9.2) Linking Photographs from Websites

Here's another option: say there's a picture or photograph on a website that you really want to have on your map, for example this one:

<http://www.wsc.ma.edu/uploads/geography-regional-planning/cb1.jpg>

This happens my picture from my website, but basically it is a picture someone has included on a website...it is not stored inside an online photo album. In this case, the sequence is a little different.



1. Double-click on the web link for the photograph you want to use. This highlights the web link in blue. Now right-click and select Copy. Now you have copied the web link into the temporary memory of your computer
2. Add a placemark for the photograph on the map and enter a title and description.
3. Now click on **Rich text**. Then on the 'Insert Image' icon (the right-most icon).
4. Delete the http:// text string in the dialog box  
Paste web link (also called the URL) of the photograph into the dialog box by right-clicking and selecting Paste. Click OK and the photograph will appear 'pasted' in the dialog box.
5. Click OK, Click Save, Click Done.  
Click on My Maps to refresh Google My Maps, and see if it worked.

Note: You may get a warning from your web browser in Step 3 – a yellow bar at the top of the screen with a warning text about scripted windows. Click on the yellow bar and select **Temporarily Allow Scripted Windows** and repeat Step 3.

➔ *The best thing now is to practice! The sequence of steps is important here!*

Linking photographs to Google My Maps is easy. The basic sequence is the same whether you are dealing with an online photo album (such as Picasa) or a picture that is part of a regular website, but the details are a bit different.

Online photo album:    Use the Embed image link from Picasa  
                                  Use the Edit HTML option in Google My Maps

Regular web site:        Use the web address (= the URL)  
                                  Use the Rich text Insert Image option in Google My Maps

## **10) Linking Videos to Your Google My Maps**

It is easy to link videos to your Google Map. Please pay attention to the sequence and details...linking videos can be a bit tricky at first!

1. Go to YouTube and find a suitable video. For example:  
<http://www.youtube.com/watch?v=tn1IMEAbgFo>
2. Right-click on the **<Embed>** button, make your selections, and copy the embed code (double-click to highlight, right-click, copy).
3. Open a second browser, or a second browser tab  
Go to the map you created in Section 5 and start editing the map.
4. Add a new placemark and enter as title: YouTube video. Also enter a short description.
5. Then: select **Edit HTML**
6. Paste the **Embed link** from YouTube into the **Description** box and click OK.
7. Click Save, click Done  
Click on My Maps to refresh Google My Maps
8. Click on the placemark from Step 4 – the video should appear in the dialog box.



**➔ The best thing now is to practice! The sequence of steps is important here!**

## **11) Adding Tools and Content to Google My Maps**

Let's explore some of the free features and tools of Google My Maps.

1. Go to Google Maps: <http://maps.google.com/maps>
2. Sign-in to your Google Account (upper right-hand corner of your screen)
3. Click on My Maps.
4. Click on the green Erlenmeyer Flask icon with the red New! Text (next to your Google account and My Profile. This opens Google Maps Labs – a testing ground for experimental features. Scroll down, enable the LatLng Tooltip, and select Save changes.

Now your cursor always shows its latitude and longitude. Pretty handy!

**➔ Spend some time exploring some of the other experimental features!**



## 12) Your Turn: Quantitative Analysis with Google My Maps

Photographs are fun, videos are even better...but how about some quantitative analysis? For me, this is the best part: Google My Maps allows you to perform some basic quantitative analysis – nothing fancy, but nevertheless very useful.

### 12.1) Finding Latitude and Longitude using Google My Maps

Home Plate, Fenway Park Latitude: \_\_\_\_\_

Longitude: \_\_\_\_\_

Statue of Liberty Latitude: \_\_\_\_\_

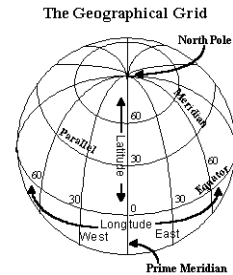
Longitude: \_\_\_\_\_

The Eiffel Tower, Paris Latitude: \_\_\_\_\_

Longitude: \_\_\_\_\_

Finding the latitude and longitude for any location in the world is actually quite useful – how else would you do it? Sure, you could walk there with a GPS receiver, but is much easier!

For comparison, find the latitude and longitude for a nearby location, for example a road intersection near your house or the summit of an accessible mountain. Use Google My Maps, a GPS receiver, and a traditional topographic map to find the latitude and longitude and compare your results.



### 12.2) Measuring Distances using Google My Maps

Shortest Home Run, Fenway Park \_\_\_\_\_

Length of Runway 33 at Boston's Logan Airport \_\_\_\_\_

Length of the Connecticut River  
(between the VT and CT border) \_\_\_\_\_

Google My Maps allow you to quickly determine length and distances – for example if you need to know the length of a building parcel, the perimeter of a wetland, or the distance between two sampling locations. The first three examples are easy, since the distances are straight lines. The Connecticut River (and every natural feature for that matter) is more complex. You could spend hours drawing = digitizing every minor twist and turn of the natural feature, but would be unreasonable and unproductive. You need to find an appropriate balance between accuracy and efficiency.

For comparison, use Google My Maps to measure the length of known feature, for example the length of football field. How does the Google My Maps measurement compare with the actual length of the football field (100 yards, assuming it is marked correctly?).

**➔ Please include your results in your Week 3 Assignment Report.**

### **13) Google My Maps and Google Earth**

So you have created a great Google My Maps and want to see it in Google Earth – no problem!

1. Go to Google Maps: <http://maps.google.com/maps>
2. Sign-in to your Google Account (upper right-hand corner of your screen)
3. Click on My Maps and select your map.
4. Click on **View in Google Earth**, click on Open, Google Earth opens, and your map is listed under Places in Google Earth.
5. Double-click on your map and fly-in!

Note: what happens here is that Google creates a so-called kml file from your Google My Maps. You can also save the file and open it in Google Earth under File – Open. You can also attach the file to an Email and share it with others.

### **14) ArcGIS Online and ArcGIS Explorer Online**

This is another great web mapping application from ESRI: <http://www.arcgis.com/home/>

The web mapping site is here: <http://www.arcgis.com/home/webmap/viewer.html>

You can save your maps and share them with others, but you need a free ESRI Global Account and register that account as a member of ArcGIS Online. I suggest you do that – we'll use some of the basemaps later on in the semester.

ArcGIS Explorer Online is found here: <http://explorer.arcgis.com/>

You can create presentations, measure distances and areas, get latitude and longitude, annotate your online maps, and choose different basemaps.

You can also download ArcGIS Explorer as a free GIS data viewer – very similar to Google Earth, but with different data layers.

<http://www.esri.com/software/arcgis/explorer/index.html>

These are great tools – especially ArcGIS Explorer, so spend some time exploring what these tools offer!

### **15) MapQuest and More!**

We have all used MapQuest: enter a start address and an end address and MapQuest gives you a route map, turn-by-turn driving directions, and even estimated distance and time for you drive. Many other websites offer the same services, for example Google Maps or Yahoo Maps.

Many cars now come with GPS Car Navigation System – same basic idea, except you also get a soothing voice and you can see your progress on the screen. Many smart phones now have apps that do the same thing.

***But – how does that work?***

Think about the GIS technology that sits behind MapQuest and car GPS navigation systems. What has to happen for you to get these driving directions and the estimate distance and time?

A simple Google Search will get you the answers in a wide variety of complexity. Here is a good and simple explanation:

<http://money.howstuffworks.com/mapquest.htm>



Phil blows his interview before even sitting down.