Google Earth II: Create a tour with Google Earth

This workshop is a continuation of The Google Earth Workshop I: Map-making Basics . You will create a tour to show the main and satellite campuses of the University of Waterloo (uWaterloo) in Ontario: including the main campus in the City of Waterloo, the School of Pharmacy campus in the City of Kitchener, the School of Architecture campus in the City of Cambridge, the Stratford campus in the City of Stratford.

The focus of this workshop is to learn how to:

- Create a placemark by writing a simple Keyhole Markup Language (KML) code
- Overlay image
- Create and record a tour
- Share the KML files and tour with others

## Part 1: Apply a KML sample to create placemark

You can create a placemark for each campus in Ontario by entering an address or street intersection. You may have learned this in the previous workshop. A new alternative is to find out the latitude and longitude values for a location and then write a simple point KML file to create the placemark.

1b

1. Search the latitude and longitude values for the uWaterloo main campus
   a. Open up Google Earth if you have not done so.
   b. In the Search box, enter the following address: 200 University Avenue West, Waterloo, Ontario.
   c. Move the cursor on top of the placemark and write down the latitude and longitude coordinates (43.468821, -80.539285) on the bottom of the screen.
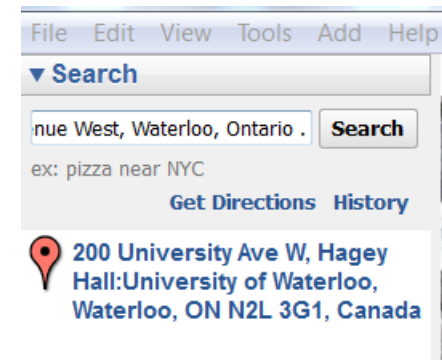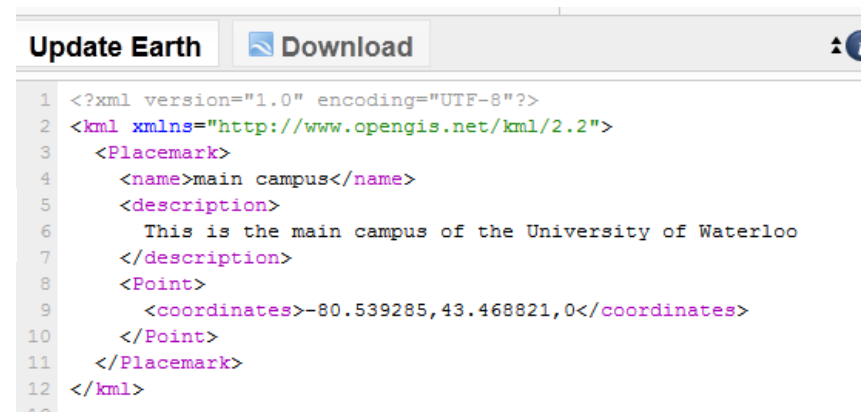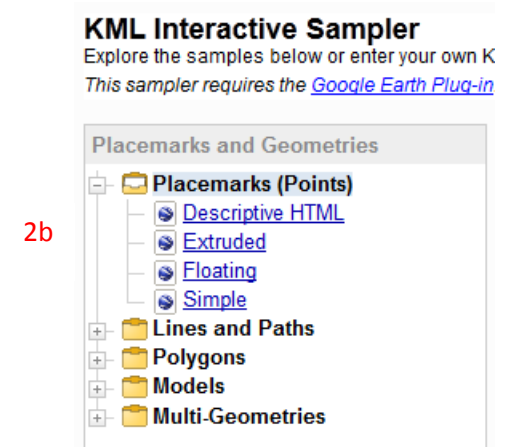
1c
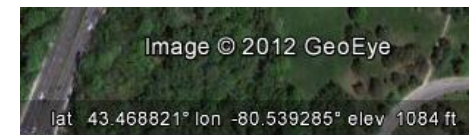
2. Modify a point KML sample file

Below is an example of a simple point placemark KML file.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Placemark>
    <name>Simple placemark</name>
    <description>
      Attached to the ground. Intelligently places itself at
the height of the underlying terrain.
    </description>

    <Point>
      <coordinates>-
122.0822035425683,37.42228990140251,0</coordinates>
    </Point>
  </Placemark>
</kml>
```

2b

KML Interactive Sampler
Explore the samples below or enter your own K
This sampler requires the Google Earth Plug-in

Placemarks and Geometries

- Placemarks (Points)
  - Descriptive HTML
  - Extruded
  - Floating
  - Simple
- Lines and Paths
- Polygons
- Models
- Multi-Geometries

This placemark KML file contains the following key elements:
- <name> that is used as the label for the Placemark
- <description> that appears in the "balloon" attached to the Placemark
- <point> that specifies the position of the Placemark on the Earth's surface (longitude, latitude, and optional altitude)

2c

Fortunately you don't have to type all the KML codes because Google provides an excellent website KML Interactive Sampler with a lot of
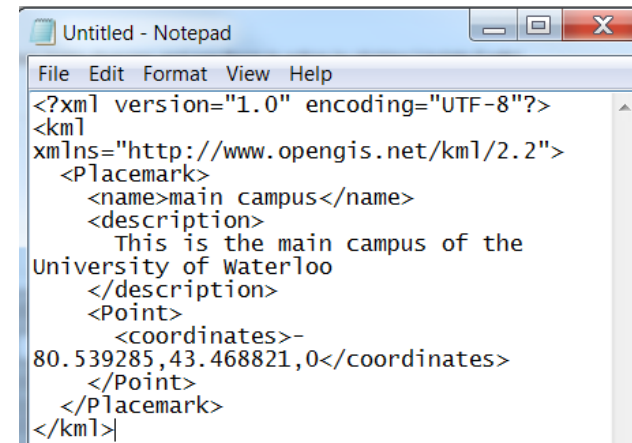
Update Earth   **Download**

```xml
1  <?xml version="1.0" encoding="UTF-8"?>
2  <kml xmlns="http://www.opengis.net/kml/2.2">
3    <Placemark>
4      <name>main campus</name>
5      <description>
6        This is the main campus of the University of Waterloo
7      </description>
8      <Point>
9        <coordinates>-80.539285,43.468821,0</coordinates>
10     </Point>
11   </Placemark>
12 </kml>
13
```

useful KML examples. The link to the website is given below:

http://kml-samples.googlecode.com/svn/trunk/interactive/index.html# (This website requires the Google Earth Plug-in, you will be directed to a web page to download the plug-in if you don't have one). What you need to do is to modify the key elements of a sample KML file and then test it by following the steps below:

   a. Open up the KML Interactive Sampler in a web browser.
   b. Click to expand the 'Placemarks' folder and then select 'Simple.' Modify name, description and point elements of the sample KML file as shown in the text panel.
   c. Click 'Update Earth' to run the KML code.

3. Save the KML code as a KML file

   a. Open up Notepad.
   b. Copy and paste all codes to Notepad.
   c. Save the file to a folder on your computer and name it "main campus.kml."
4. Add the KML into Google Earth.

   a. Right click under 'My Places' and select 'Add'.
   b. Assign a name for the new folder – 'Campus'.
   c. Go to 'File' menu, select 'Open' and add maincampus.kml into

   Google Earth.

5. Now you will need to repeat Steps 1-4 to create a KML file for every satellite campus. For your convenience, their addresses and latitude and longitude coordinates are provided below:

3b

```
Untitled - Notepad
File  Edit  Format  View  Help
<?xml version="1.0" encoding="UTF-8"?>
<kml
xmlns="http://www.opengis.net/kml/2.2">
   <Placemark>
      <name>main campus</name>
      <description>
        This is the main campus of the
University of Waterloo
      </description>
      <Point>
        <coordinates>-
80.539285,43.468821,0</coordinates>
      </Point>
   </Placemark>
</kml>
```

4a
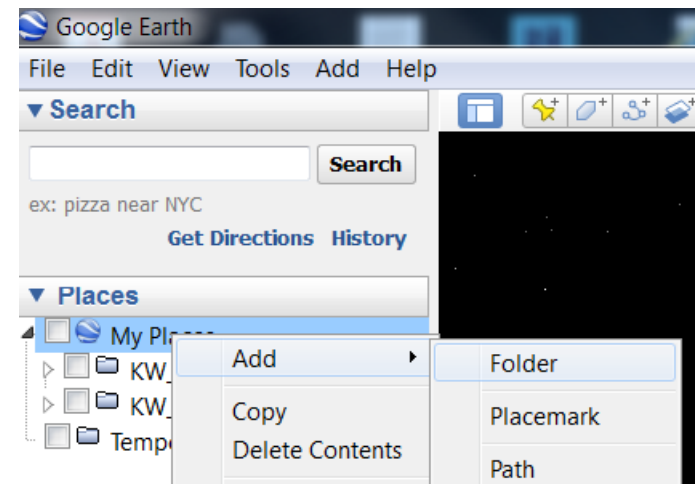
Kitchener Health Sciences Campus

King & Victoria Streets, Kitchener, Ontario

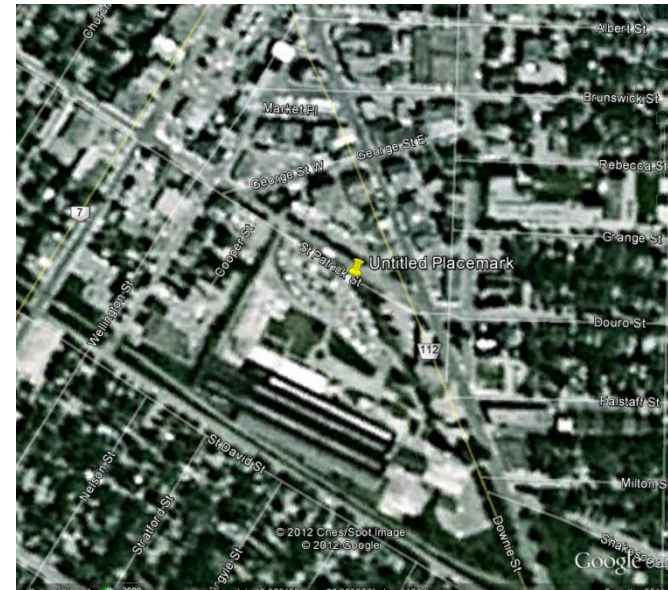*43.452862, -80.498202*

Stratford campus

6 Wellington Street, Stratford, Ontario

Latitude 43.367961 Longitude -80.981679

School of Architecture

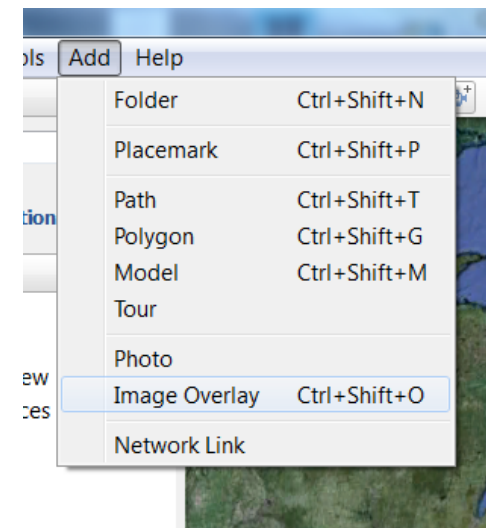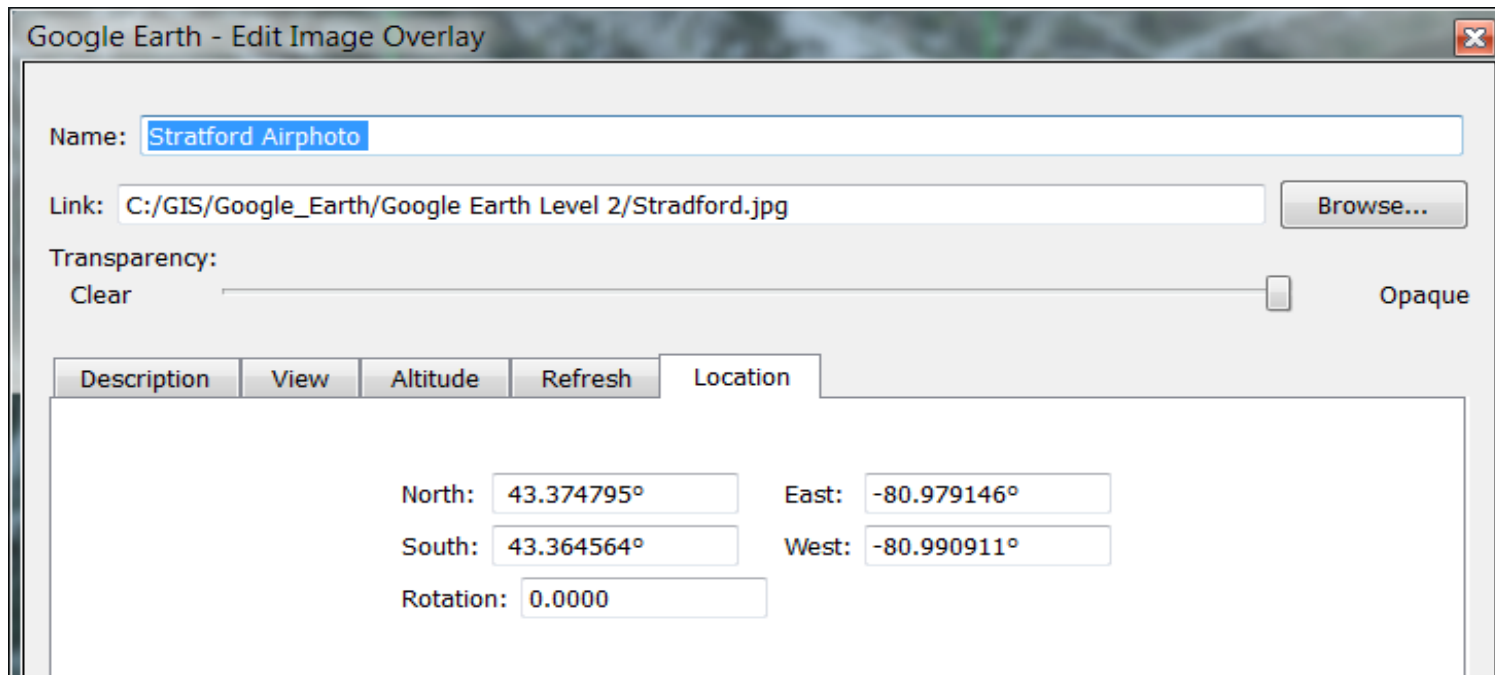*7 Melville Street South, Cambridge, ON*

43.358576, -80.316931

Part 2: Image Overlay

The satellite image's resolution for the Stratford campus is not high enough to see the building details. Now you are going to overlay a high resolution airphoto covering the site in Google Earth by following the steps below.

1. Go to 'Add' menu and select 'Image' overlay.
2. Fill the relevant information in the 'Edit Image Overlay' message window.
   a. Assign a name to the image as 'Stratford Airphoto'.
   b. Click 'Browse' and add a link to where the image is located on the computer
   c. Click the location tab and fill in the longitude and latitude (east, west, north and south) value as below. Click OK when you finished.

Google Earth - Edit Image Overlay

Name: Stratford Airphoto

Link: C:/GIS/Google_Earth/Google Earth Level 2/Stradford.jpg   Browse...

Transparency:
Clear ──────────────────────────── Opaque

| Description | View | Altitude | Refresh | Location |

North: 43.374795°   East: -80.979146°

South: 43.364564°   West: -80.990911°

Rotation: 0.0000

    d.   This will create a new KML file and move it into the campus folder under 'My Places'.

If you want to know how to obtain the coordinate values (east, west, north and south) of an aerial image, please refer to the Appendix.

Alternativly, you can modify the KML codes of the 'Large Ground Overlays' example. The elements that have been modified are highlighted in yellow.

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <GroundOverlay>
    <name>Stratford campus</name>
```
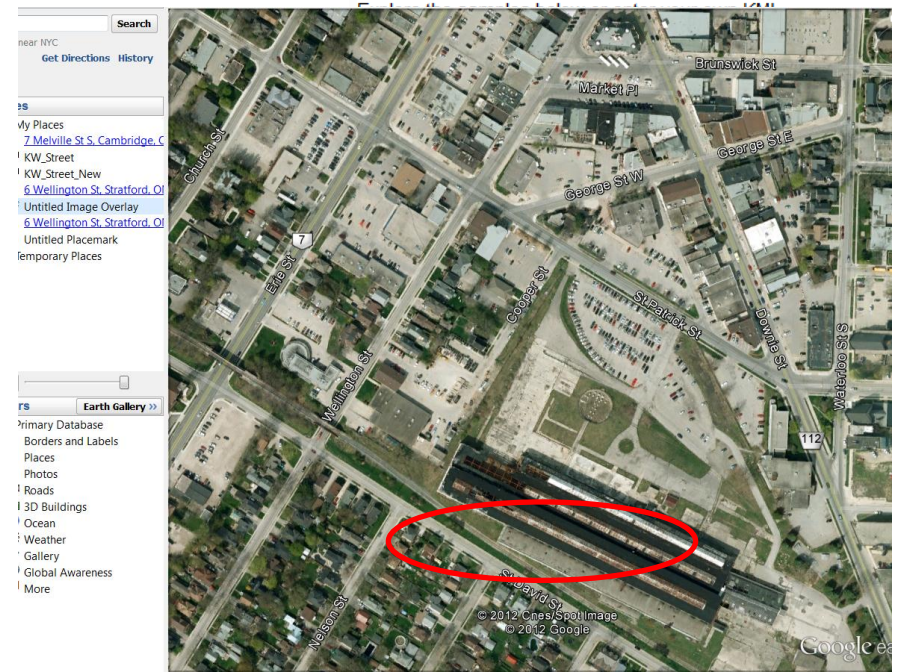
```
  <visibility>1</visibility>
  <description>Overlay shows an airphoto taken in spring 2010</description>
  <Icon>
    <href>C:/GIS/Google_Earth/Google Earth Level 2/Stradford.jpg</href>

</Icon>

// Where the airphoto is located
    <LatLonBox>
      <north>43.374795</north>
      <south>43.364564</south>
      <east> -80.979146</east>
      <west> -80.990911</west>
      <rotation>-0.1556640799496235</rotation>
    </LatLonBox>
  </GroundOverlay>
</kml>
```

You can copy and paste the codes into notepad and save it as KML file. Then open up the KML file in Google Earth.

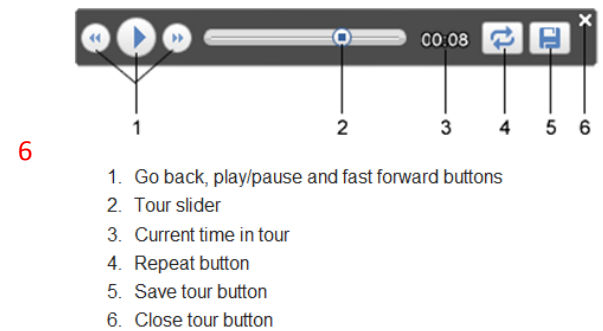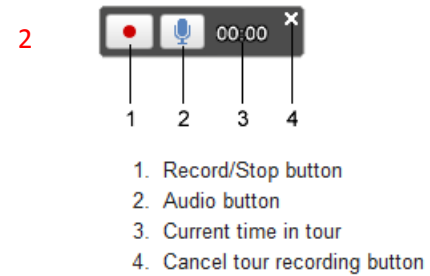The overlayed airphoto will look like the screen capture to the right.

Part 3: Create and play a tour

Before you proceed to create a tour showing the uWaterloo campuses in Ontario, check if all your five KML files are under 'Campus' folder as shown on the right. Next you will follow the steps below to create the tour:

1. On the toolbar at the top of your screen, click the 'Record a tour' button – a small video camera icon.
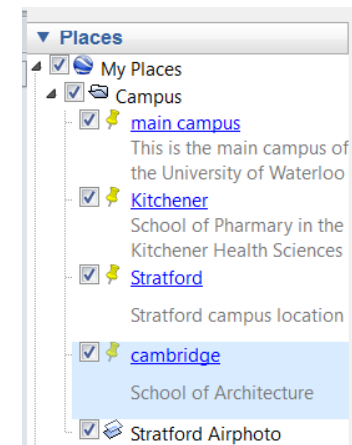
2. The record tour controls appear in the bottom left corner, click record button to start recording. It will start recording every navigation in Google Earth.
3. Now double click the main campus KML file under the campus folder in 'My Places'. This will bring you to a view of the uWaterloo main campus. Use your mouse to zoom in, zoom out, and rotate the view for a few seconds.
4. Repeat the same procedure for the Kitchener, Stratford and Cambridge KML files. If you like, you can switch to Google street view and use your mouse to move around.
5. Click the stop button when you finish creating the tour.
6. Play back and save the tour.

2

1. Record/Stop button
2. Audio button
3. Current time in tour
4. Cancel tour recording button

6

1. Go back, play/pause and fast forward buttons
2. Tour slider
3. Current time in tour
4. Repeat button
5. Save tour button
6. Close tour button

Part 4: How to share the KML files and tour with others

It is fairly easy to share the KMLs files and tour. Right click under 'Campus' folder and click 'Save Place As', assign the file a name and save it as a KML. Next you can attach the KML in e-mail or post it on a website.
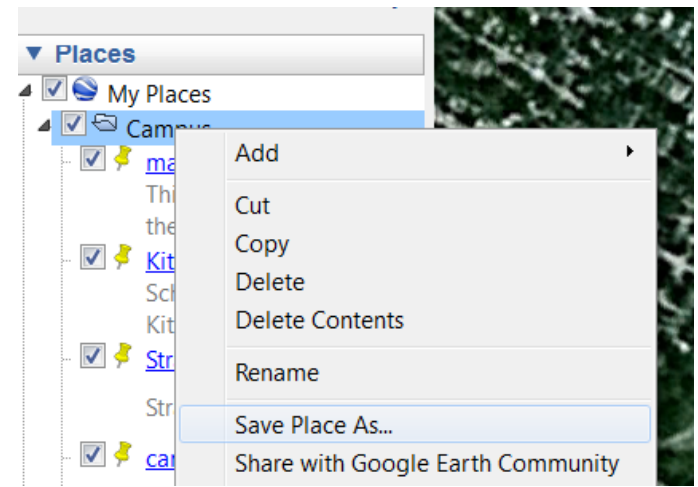
Appendix: How to get the coordinate values (east, west, north and south) of an aerial image

1. Open up ArcMap.
2. Open the Data Frame Properties window by right clicking the mouse under 'Layers'.
3. Click the 'Coordinate System' Tab and then select a coordinate system by clicking 'Predefined'-> 'Geographic Coordinate System'->'World'->'WGS 1984'. Click OK when you finish.
4. Now you will need to add two airphotos covering uWaterloo Stratford campus into ArcMap. Click the add data button and add two airphoto as shown below.
5. Zoom in until you can see the building footprints around Stratford campus clearly.
6. Export a map. Go to File -> Export Map. In the 'Export Map' window, set the file name, file type and resolution as shown below. Make sure you also select 'Write World File'. Click 'Save' when you finish.
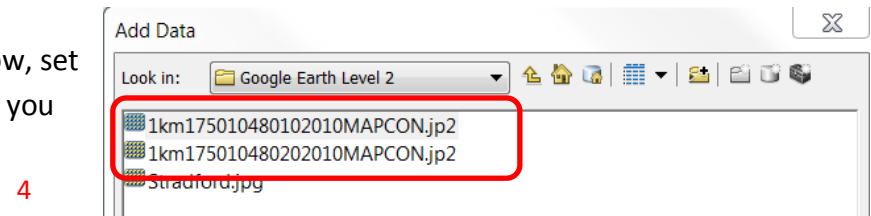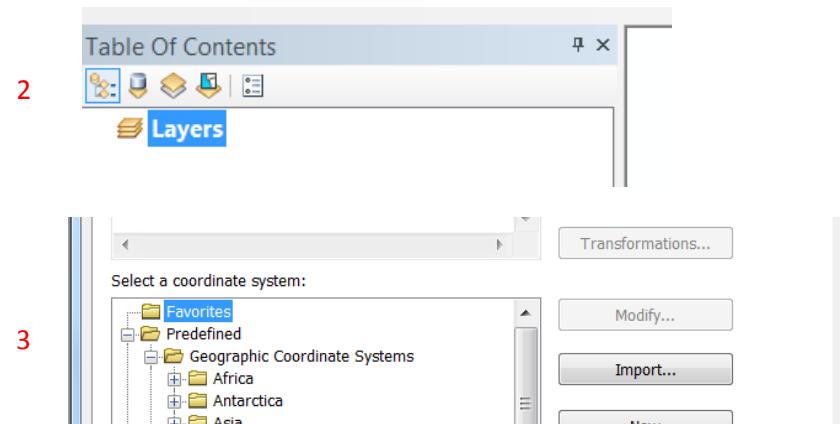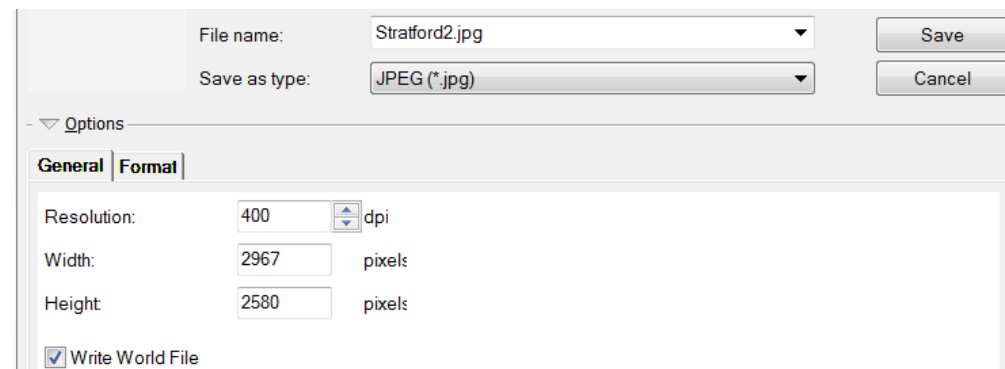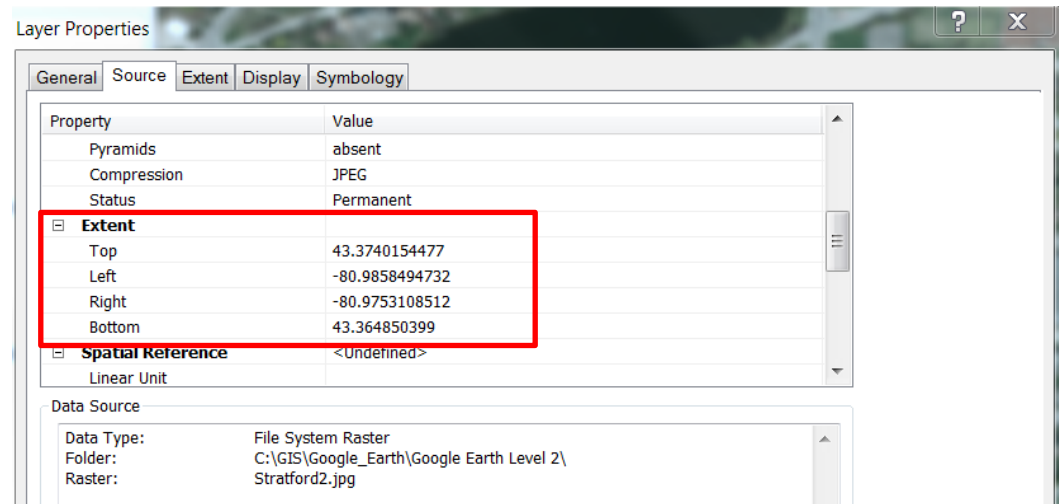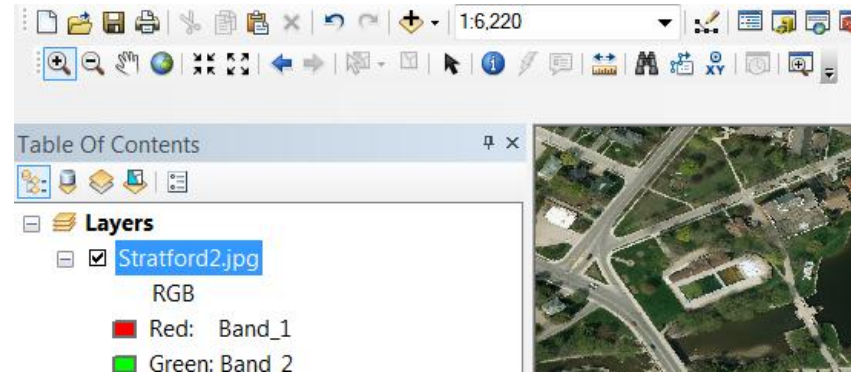
7. Now add the file 'Stratford2.jpg' back to ArcMap.

7

8. Double click the 'Stratford2.jpg' to open up its 'Layer properties'. Scroll down until you find the 'Extent'. That is the coordinate information that you are looking for.

Top – North

Bottom – South

Left –East

Right- West

8

Steve Xu

July 10, 2012