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Geo385
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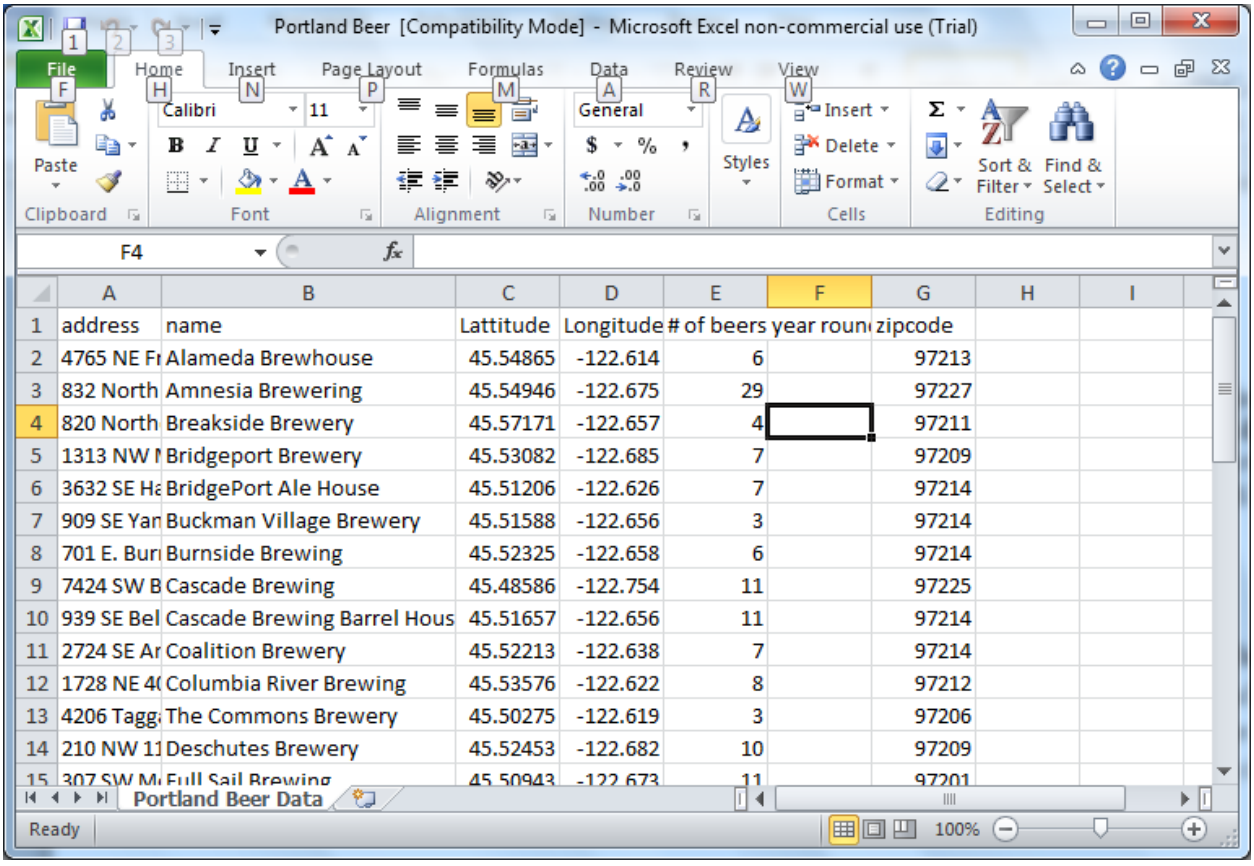
Creating and Using Selection and Buffer Tools

My project purpose was to develop a mapping service that would let you choose a location based on an attribute. From there, see how many other locations of interest are within a given distance. The tools I used within the ArcMap Model Builder where the Select by Attribute tool as well as the Buffer tool as well. With the model built and running successfully I used the ArcGIS Server Manager to create a map service, as well as bring in the tools.

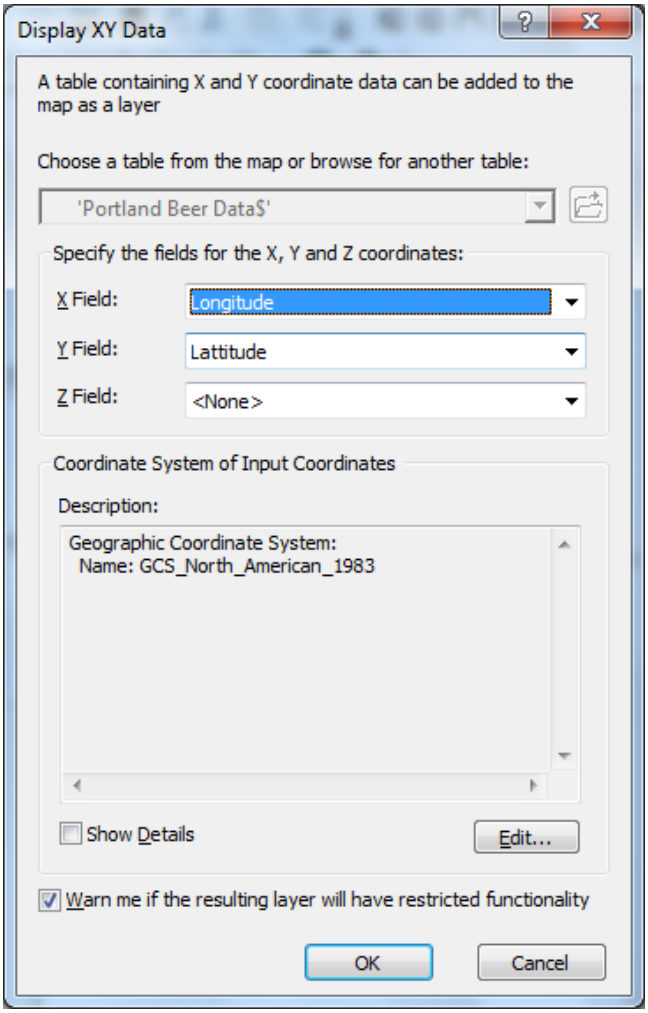
Creating a Well Balanced Map

Within ArcMap I created a map of the Portland, Oregon, Metro area. I used data from the ESRI data and maps packet that I received with the software from ESRI. I also found the data for the breweries that lie within the Portland Metro area on the website http//www.*Portlandbeer.org.* With the data for the breweries not being in any sort of spatial format, I had to manually input the data into an excel spreadsheet.

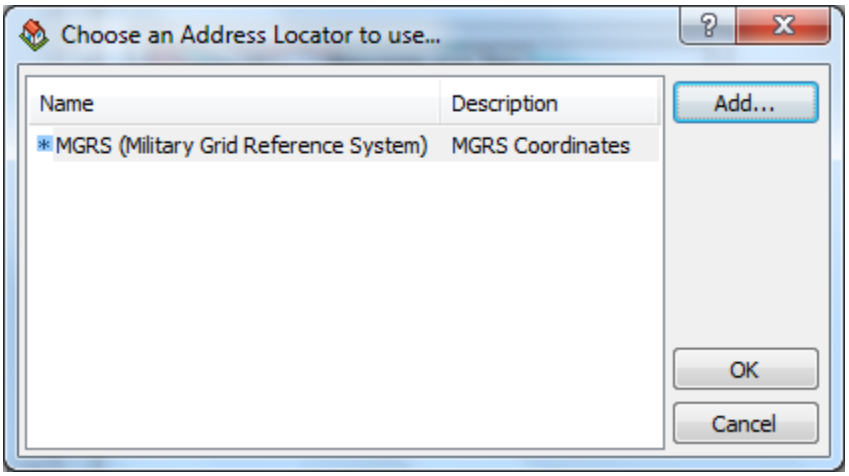


	A	B	C	D	E	F	G	H	I
1	address	name	Lattitude	Longitude	# of beers	year roun	zipcode		
2	4765 NE F	Alameda Brewhouse	45.54865	-122.614	6		97213		
3	832 North	Amnesia Brewering	45.54946	-122.675	29		97227		
4	820 North	Breakside Brewery	45.57171	-122.657	4		97211		
5	1313 NW I	Bridgeport Brewery	45.53082	-122.685	7		97209		
6	3632 SE Ha	BridgePort Ale House	45.51206	-122.626	7		97214		
7	909 SE Yan	Buckman Village Brewery	45.51588	-122.656	3		97214		
8	701 E. Bur	Burnside Brewing	45.52325	-122.658	6		97214		
9	7424 SW B	Cascade Brewing	45.48586	-122.754	11		97225		
10	939 SE Bel	Cascade Brewing Barrel Hous	45.51657	-122.656	11		97214		
11	2724 SE Ar	Coalition Brewery	45.52213	-122.638	7		97214		
12	1728 NE 4(	Columbia River Brewing	45.53576	-122.622	8		97212		
13	4206 Tagg	The Commons Brewery	45.50275	-122.619	3		97206		
14	210 NW 11	Deschutes Brewery	45.52453	-122.682	10		97209		
15	307 SW M	Full Sail Brewing	45.50943	-122.673	11		97201		

With this I had to import the table into the ArcMap document I was working on. From there I displayed the points as XY Data. I used the Latitude Longitude data I collected from Google maps when I was gathering data on the breweries.

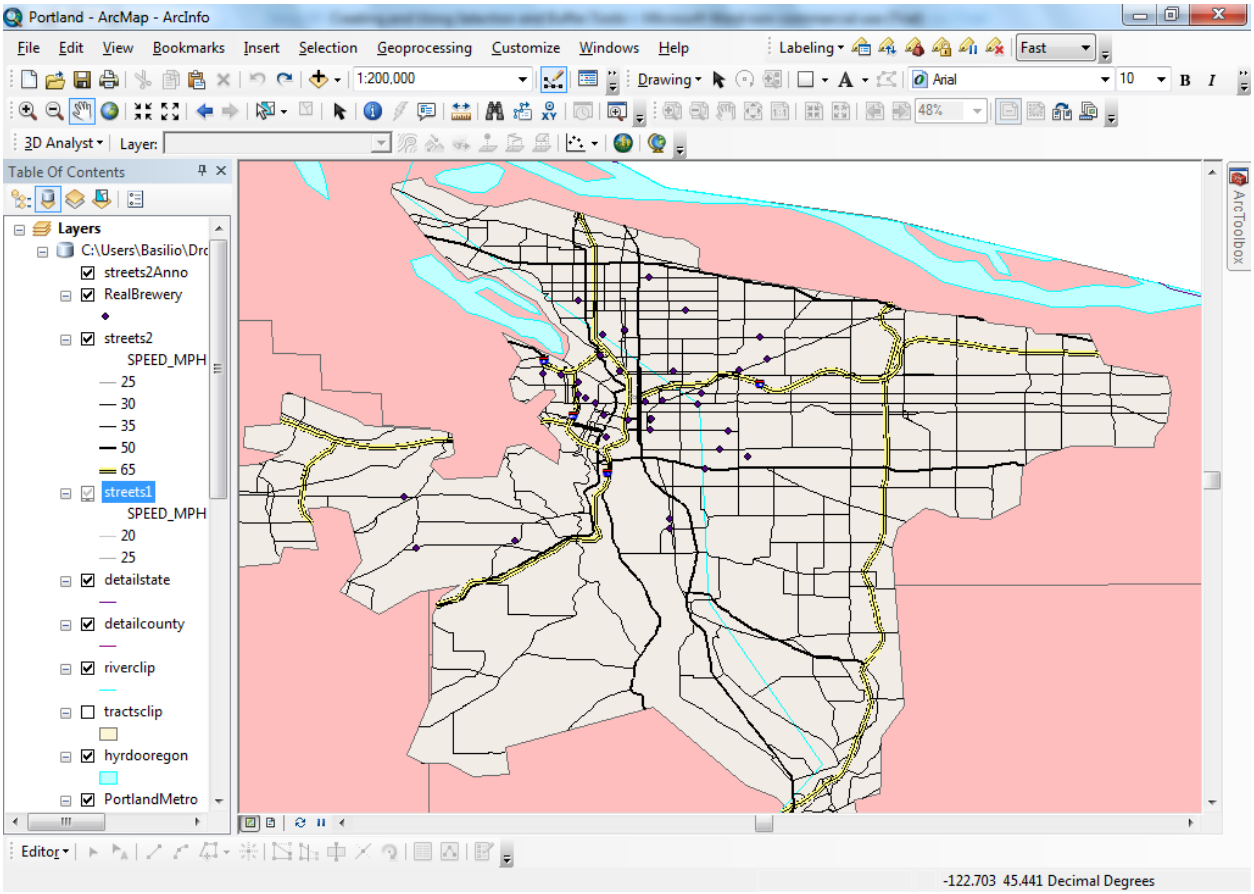


I had originally tried to geocode the breweries to the map using the default geocode addresses tool within ArcMap.



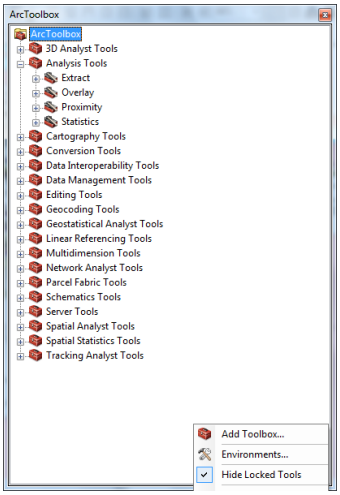
I got the point data to display; however later on the geoprocessing within the Arc Server Manager did not with the Geocoded Points.

So with the map neatly done up; I then proceeded to the next step of the web service process.

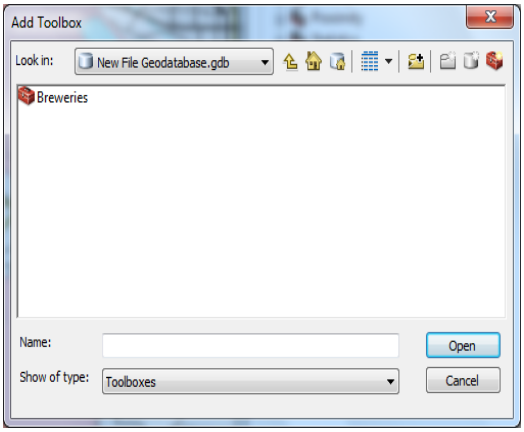


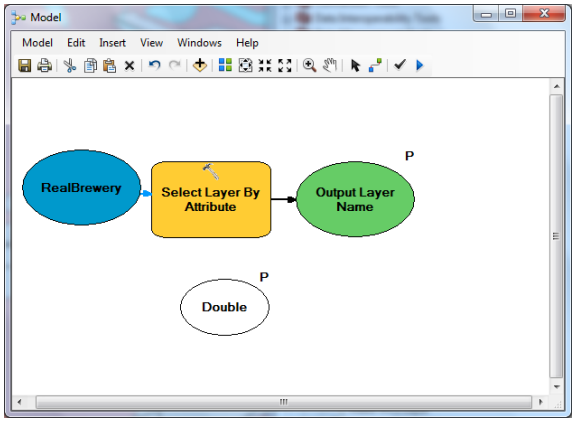
Creating a Model within Model Builder

With my map set the way I liked it, I made a copy of it, for Server Manager likes it if you keep the base map service and the additional geoproccessing tools separate. With my copy I proceeded to add a new toolbox to my ArcToolbox window.

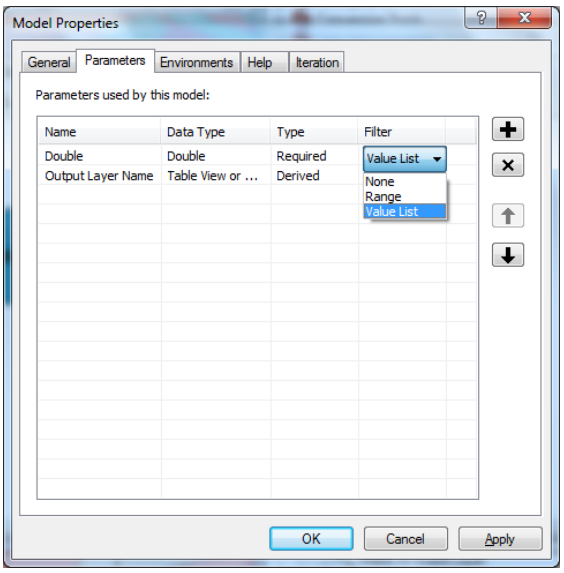


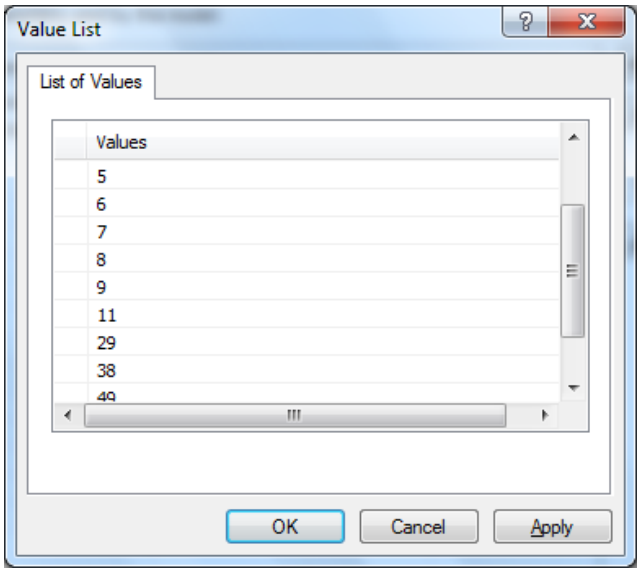
Within the new toolbox, I named mine Breweries, I created a new model. One that would select the breweries based on an attribute. The attribute I used was the number of beers the brewery had available year round. I did not get into seasonal brews; however the majority of the breweries do craft the occasional seasonal brew. I wanted to make it so a person could find out the number of beers they could expect regardless of the time of year they were in Portland.





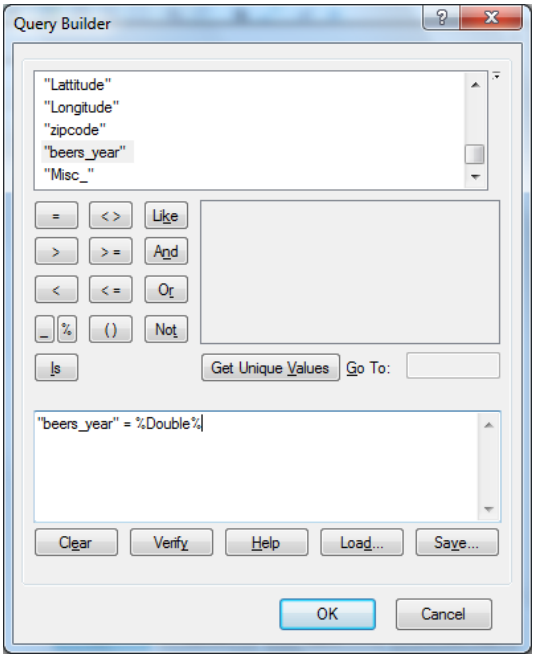
You want to create a variable once you have your tool in the new model. I chose a double variable this time because the attribute table for the number of beers year round is numbers. You need to make the variable a parameter; then under model properties, under the parameters tab click the value list from the dropdown in the filter portion.



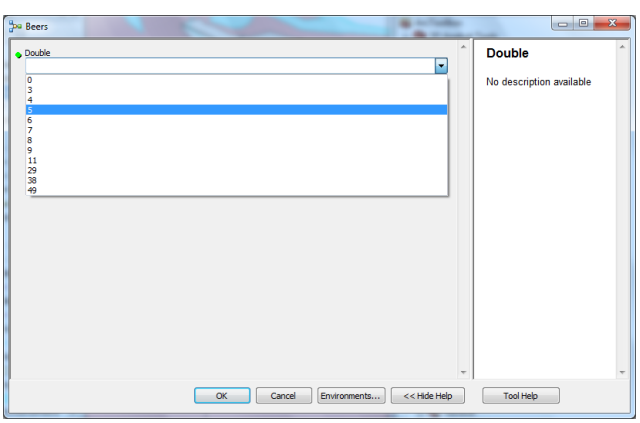


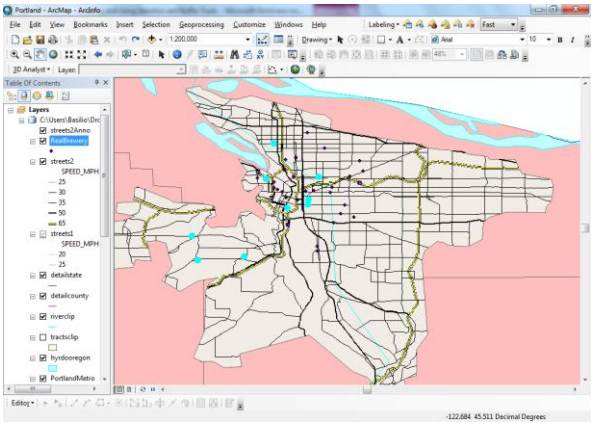
For the values I typed in the numbers that appeared in the Beers Year Round column.

Now inside the Select by Attributes Tool, I needed to write a SQL expression that would allow the end user to choose the number of beers they wanted a brewery to have.



The ‘”%” is the variable notation, letting the query builder know that it is looking for the variable labeled “Double”. You can name the variable whatever you choose; I just chose to keep it labeled “Double”. I saved it at this point, actually many times prior to now, being done building; it was now time to test the model out; to see if I made the model correctly. Exiting the model builder and running the model from the toolbox I got this toolbox window.

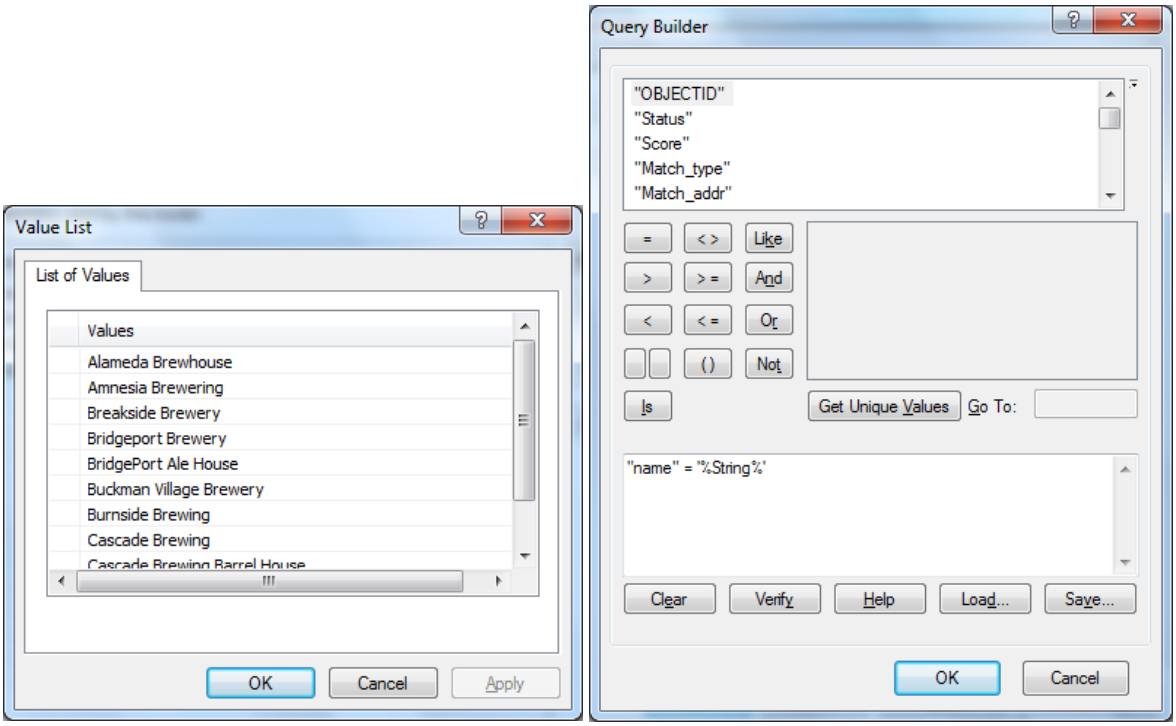




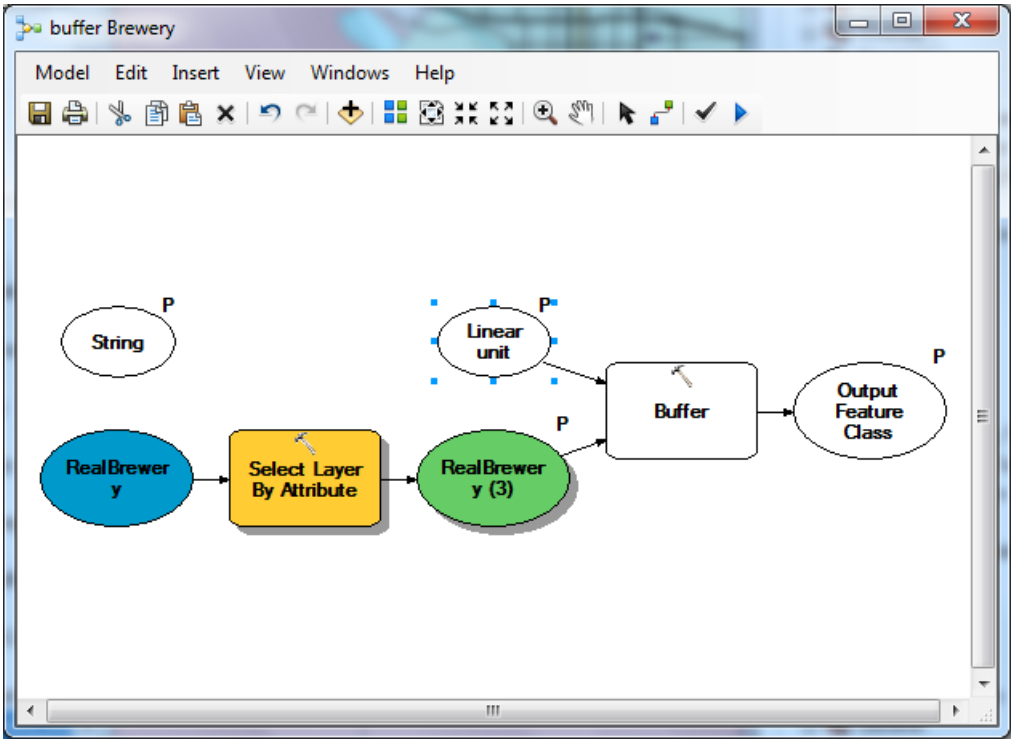
From the selection I chose the number 11 from the drop down, and I got nine breweries that have eleven beers on tap year round. So this Model works, on to the next one.

For the next tool I wanted to let the user be able to see how many breweries are within a distance from the one they are at. If say they are at the Amnesia Brewery, and they wanted to know how

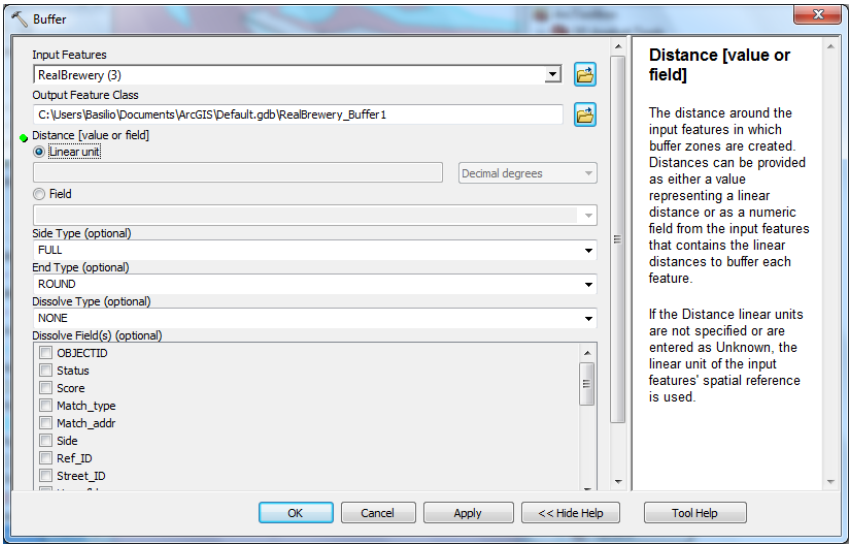
many breweries are within five hundred feet, or one mile; I wanted them to be able to choose the distance and the brewery they were at. Again I copied the original map document, and added a new tool box to this one as well. Being that Arc Server Manager likes to have one toolbox per map document and also one model per toolbox. So I created a new toolbox and a new model. Within the new model I chose the Select by Attribute tool, for I would be selecting the brewery based on the name. Created a string varied, string is what you need if you are making a list of text, made it a parameter again. Also I went to the model properties again and under the parameters tab chose the value list from the filter drop down and filled the table that popped up.



Within the Select tool for the expression I used the one above. Note that there are single quotes around the string variable, they are neccesary if you are using a streing variable. The Double did not need them, it is only for the String variable. Now my Select by Name is set up. On to the Buffer part of the tool. (See Below)

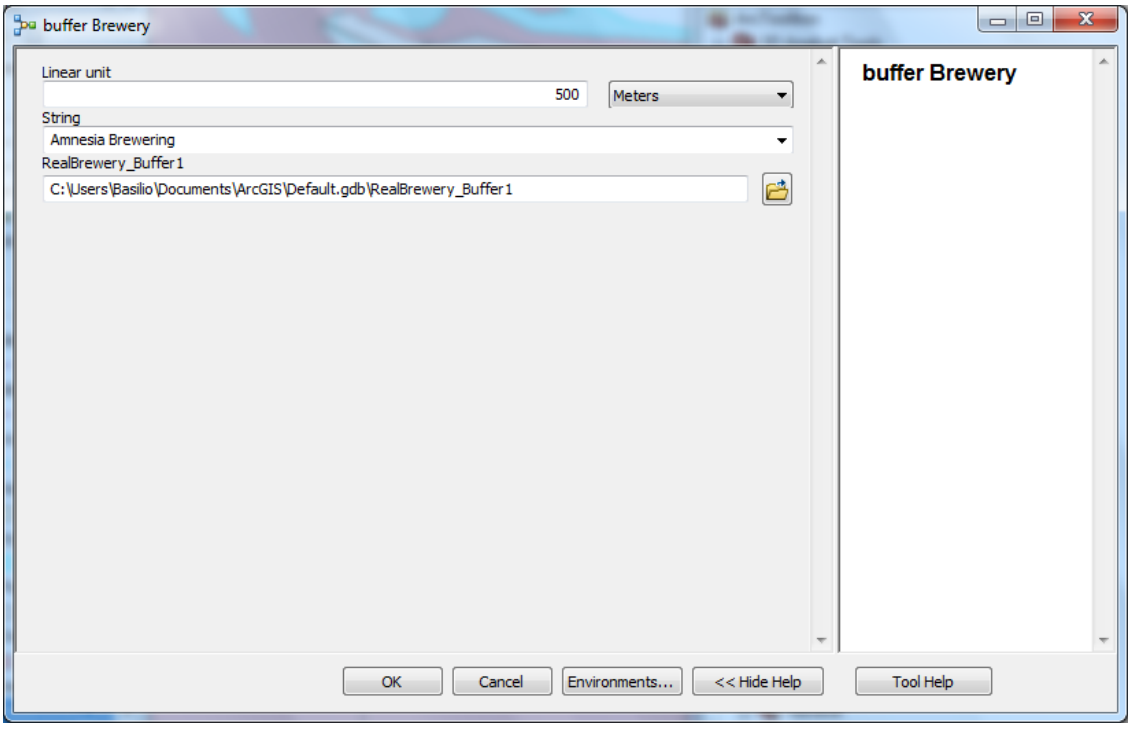


For the buffer I created a new Linear Unit Variable, this is the variable that allows the end user to choose what unit of measure they want as well as input the number they would like. If they wanted to see how many breweries lies within 200 Meters or within 1 Decimal Degree, they have that option thanks to the linear unit variable. I chose the Selection output as the input for the Buffer, and the linear unit variable for the linear unit value field.

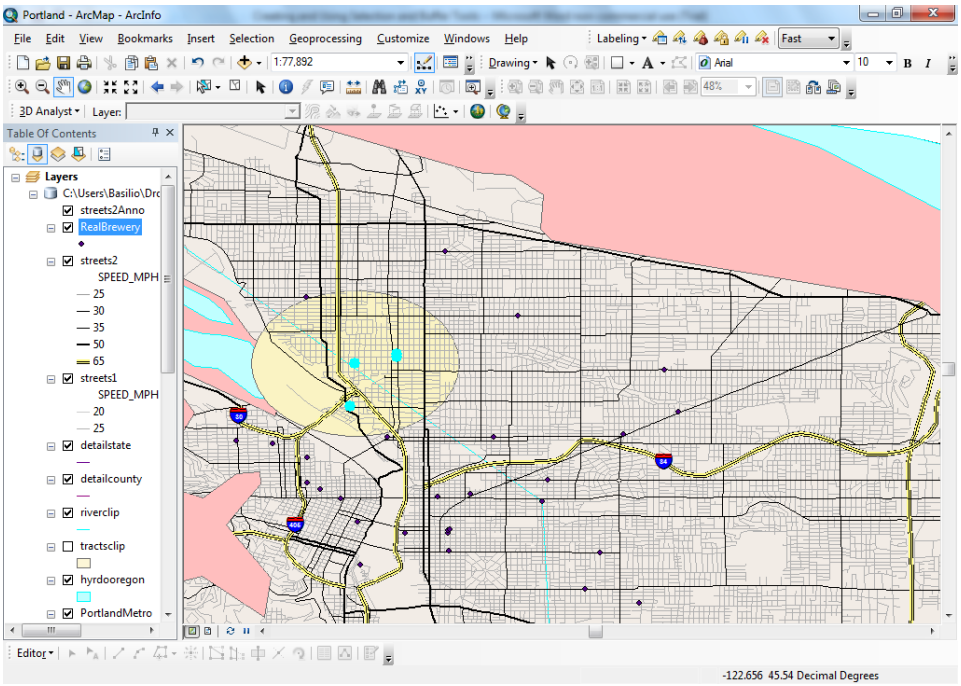


I chose to add the Buffer output to the display, as well as the Selection output as well. That way you know where you are at as well as where the buffer zone is as well.

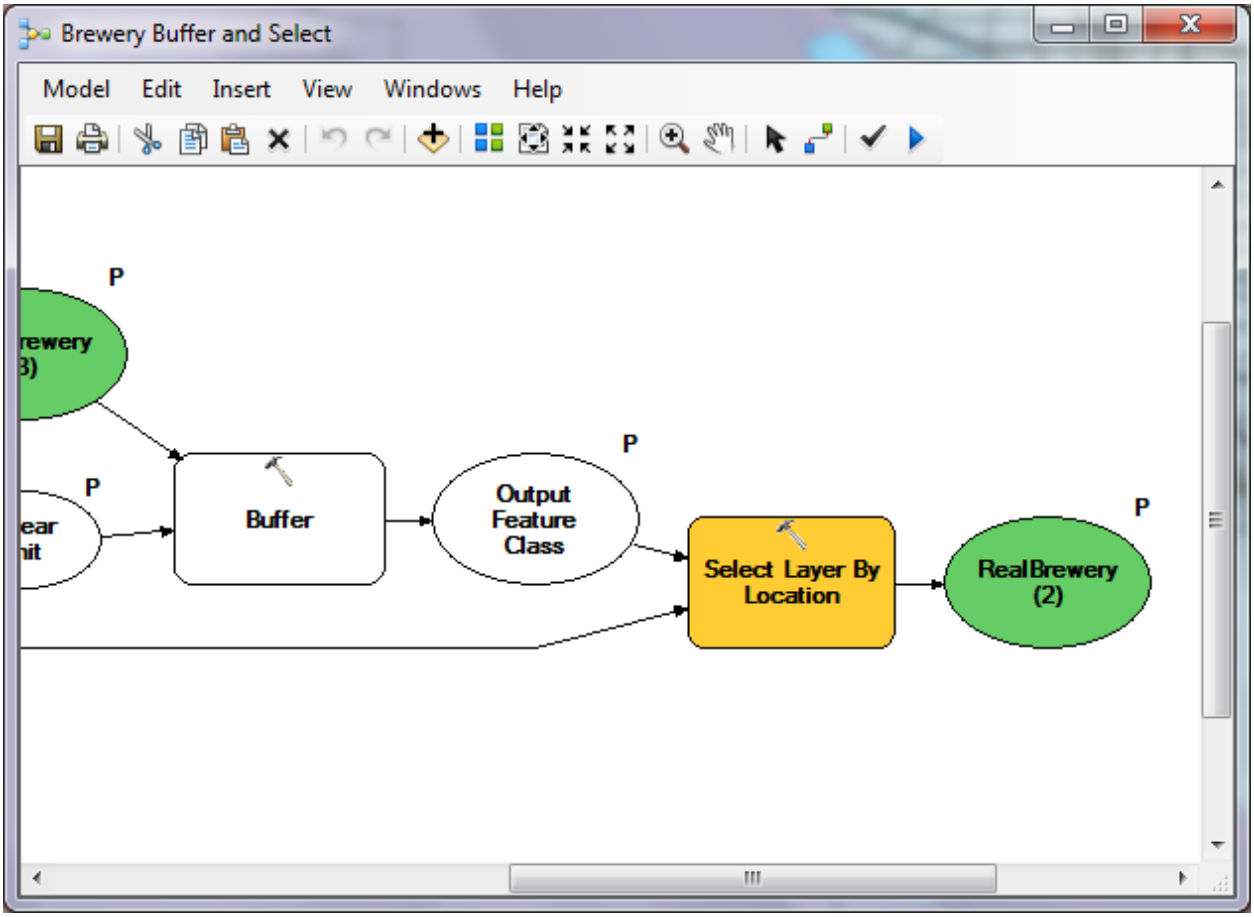
Saved the model, again this was not the first time, exited out of the model builder;then ran the model from the tool box window. I got a tool dialog box open, and then chose the variables I wanted, in this case 1 mile for the distance and Amnesia Brewing for the selection.



Chose okay to let the model run, crossed my fingers and got the following.



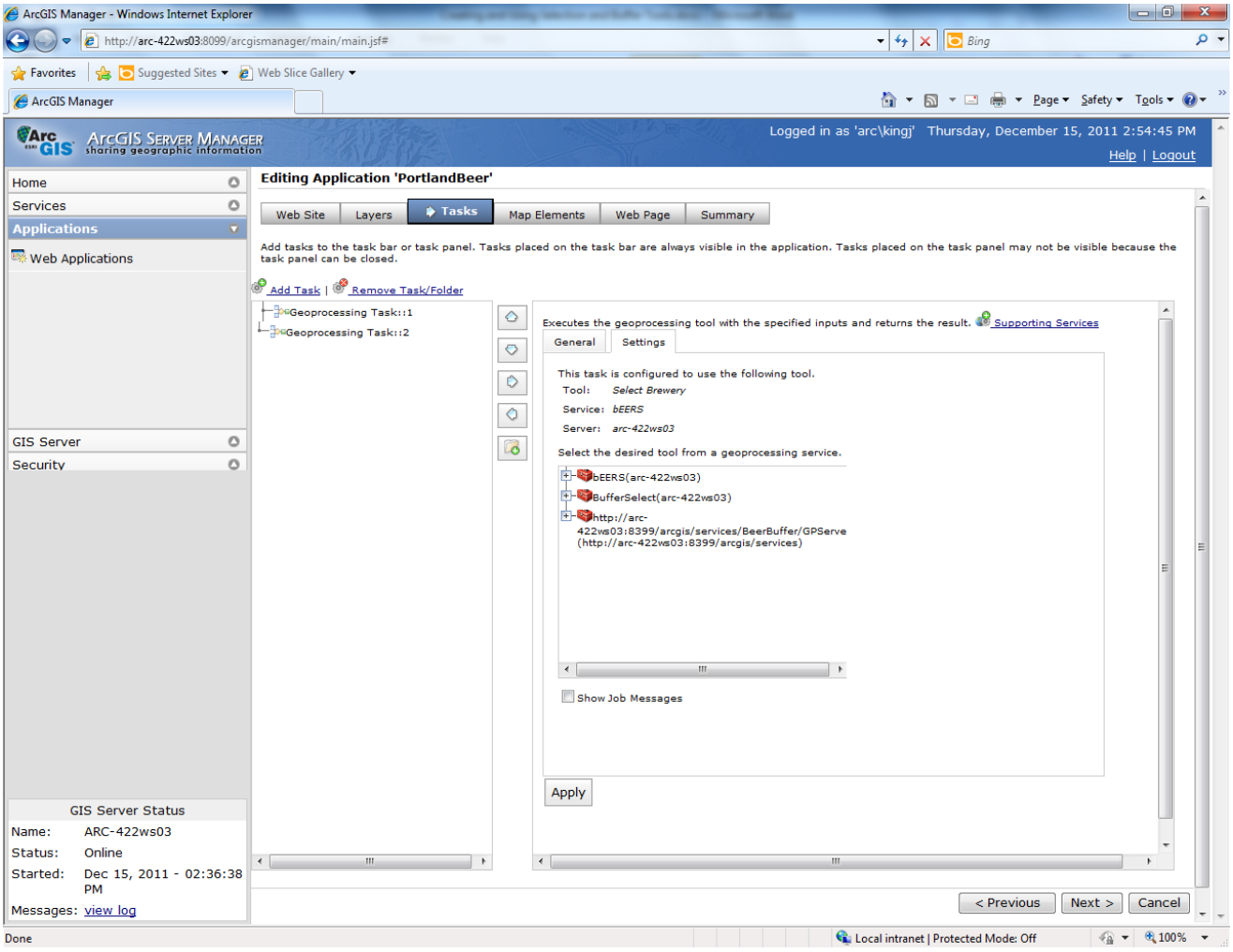
As you can see there are three breweries within 1 mile from the Amnesia Brewery. The next Process I wanted to be abke to select the breweries within the buffer zone. SO back to the model builder. I added the tool Select by Location, used the original point data as the selection, and used the Buffer output as the area to select from. Chose the option within from the dropdown, and it was good to go.



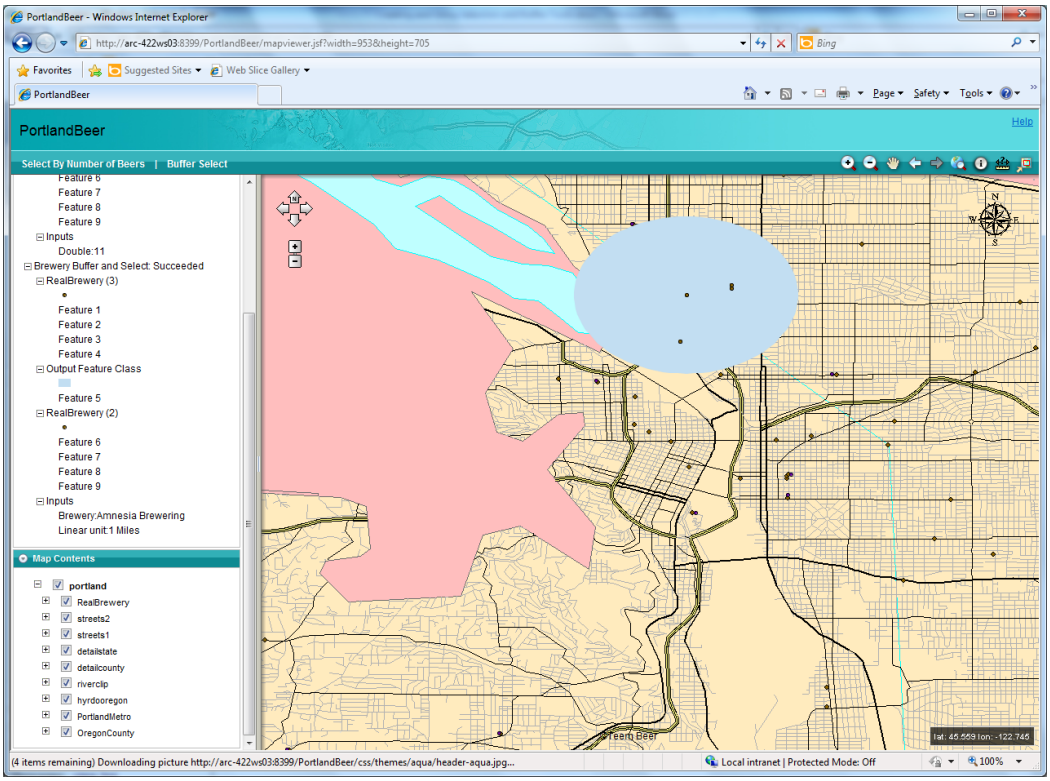
So Success after this it is all up to the Arc Server Manager.

Arc Server Manager

With the ArcMap document working it is time to upload it to the ArcServer Manager. I created a map service with the barebone map document. Using this as the bas layer I then created a web application. Just the bare bones map in the background. After I set this up, I create a new geoprocessing task. With the new service I used the second map document, the one containing the select by number of beers in it. Created a service, and then added the geoprocessing tool into the map application. I repeated this process for the second tool as well.



Using the tasks tab, I added both tools and saved the web application. Redeployed the map application and prayed that would work. Eventually it did and I got both tools to work, which is fortunate for the computer.



Some Trails and Tribulations

As I mentioned earlier I first used the geocoding tool in ArcMap to display the data as points. I was not sure if this would work because the classroom I was working in was having a bug with the geocoding. I thought that maybe since I was not trying to use a geocoing tool in the web application I would be fine. It was just data afterall. I was wrong. IAfter I tried and tried to make the web application work with the geocoded points, I eventually tried to just display the X Y data using the Longitude and Lattitude of each of the breweries. After this it was farily straight forward. At least with the Web service and web application.

Model Builder is another story. I did a lot of trial and error to make the linear unit variables as well as the string variables as well. But finaly after ready through some ArcHelp, I was able to make the models run.

The process of the web application after the first hickup of the geocoded data was not riddled with setbacks. Once I got the the base base map up there and added the tools, I was golden.

The Conclusion

So after this class, I am so much more comfortable with the model builder. As of yet I have not really had much instruction on how to use the builder beyond the very basic tools. There was not a lot of talk of variables nor SQL querry expressions, or parameters. With this knowledge I now posses I would like to try to develop my map service even further. Maybe even trying to add more data, layers, and deffinatly adding more tools to select or query the different data.