

# Tutorial ArcGIS

## Geoinformática aplicada con aprendizaje basado en problemas. Capítulo 10 - problema 6. Diseño de geodatabase: caso manzanas Medellín

*En este tutorial aprenderemos como solucionar el capítulo 10 del libro “Geoinformatica aplicada con aprendizaje basado en problemas.” Problema 6. Diseño de Geodatabase: Caso manzanas Medellín; Por medio de ArcCatalogo.*

**Trabajo de grado - Proyecto de investigación denominado  
“Prácticas ágiles de Ingeniería en el desarrollo de contenidos  
de aprendizaje interactivos para Geoinformática con  
Aprendizaje Basado en Problemas”**

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## Problema – Geodatabase: caso manzanas Medellín

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En Medellín se piensa presentar un proyecto para atender las necesidades sociales manzana por manzana de la ciudad y cuenta con funcionarios que atenderán todas en las que se encuentra dividida. Para este fin requiere una geodatabase que responda, entre otras, a las siguientes consultas:

1. Mostrar las manzanas a las que no les han asignado responsable, que interceptan estratos 1, 2 o 3 y que se encuentran a una altura de entre 1650 y 1750 msnm.
2. Mostrar las manzanas que están a una altura de entre 1500 y 1750 msnm y que tienen bajo su responsabilidad Adelaida Morales Dejodas, Alejandro Villanueva Hervas, Alfonso Rodríguez Iglesias Ana Gómez.
3. Mostrar las urbanizaciones que se ubican entre 2000 y 4000 m de las manzanas que están a una altura de entre 1650 y 1750 msnm y de las cuales son responsables Adelaida Morales Dejodas, Alejandro Villanueva Hervas, Alfonso Rodríguez Iglesias o Ana Gómez.
4. Mostrar las comunas con el número de manzanas que interceptan barrios con áreas mayores a 1'000.000 m<sup>2</sup>.

Se cuenta con las siguientes capas: manzanas\_medellin.shp (polígonos -clave foránea del responsable fkidrespo-), estratos\_medellin.shp (polígonos), sitiosinteres\_medellin.shp (puntos), curvasnivel\_medellin.shp (poli-líneas), comunas\_medellin.shp (polígonos), barrios\_medellin.shp (polígonos), además de una tabla llamada responsables.dbf (registros con los datos de los responsables de atender las manzanas). Los fundamentos teóricos necesarios son:

- Geodatabase, Tipos de geodatabases [1]
- Los diseños de Bases de Datos, conceptual, lógico, físico y del modelo entidad relación [2-7].
- Feature Dataset, Feature Class, Relationship Class [8].
- Subtipos, dominios [8].
- Clave Primaria, Clave foránea [9].
- Consultas por atributo, consultas por localización [10].
- Join tabular, Join espacial [11, 12].
- Desarrollar el Tutorial de Geodatabase [13].

## Diseño físico

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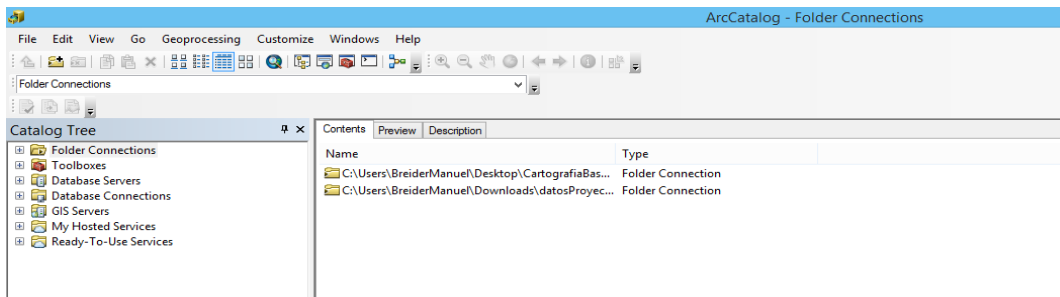
El diseño físico de la base de datos depende del SGBD a utilizar y, para el caso de una base de datos espacial que será estructurada, actualizada y consultada desde Arcgis 10.x, requiere un sistema adicional que permita la persistencia de los datos (repositorio de datos). El manejo de los datos espaciales obedece a un modelo objeto-relacional, es decir, una base de datos relacional a la que se le implementan características del paradigma orientado a objetos.

El diseño físico para el desarrollo de este problema se orienta para tres repositorios diferentes: FileGeodatabase, Oracle y SqlServer. Cabe anotar que para el modelo físico del caso Manzanas no se requiere la tabla intermedia BarriosCurvas, ni las claves foráneas FkIdBarrio y FkIdComuna, debido a que las consultas requeridas, que involucran solamente objetos espaciales (Manzanas, Barrios, Sitios de interés, Curvas de nivel y Comunas) se pueden obtener a través de las relaciones espaciales entre ellos (consultas por localización).

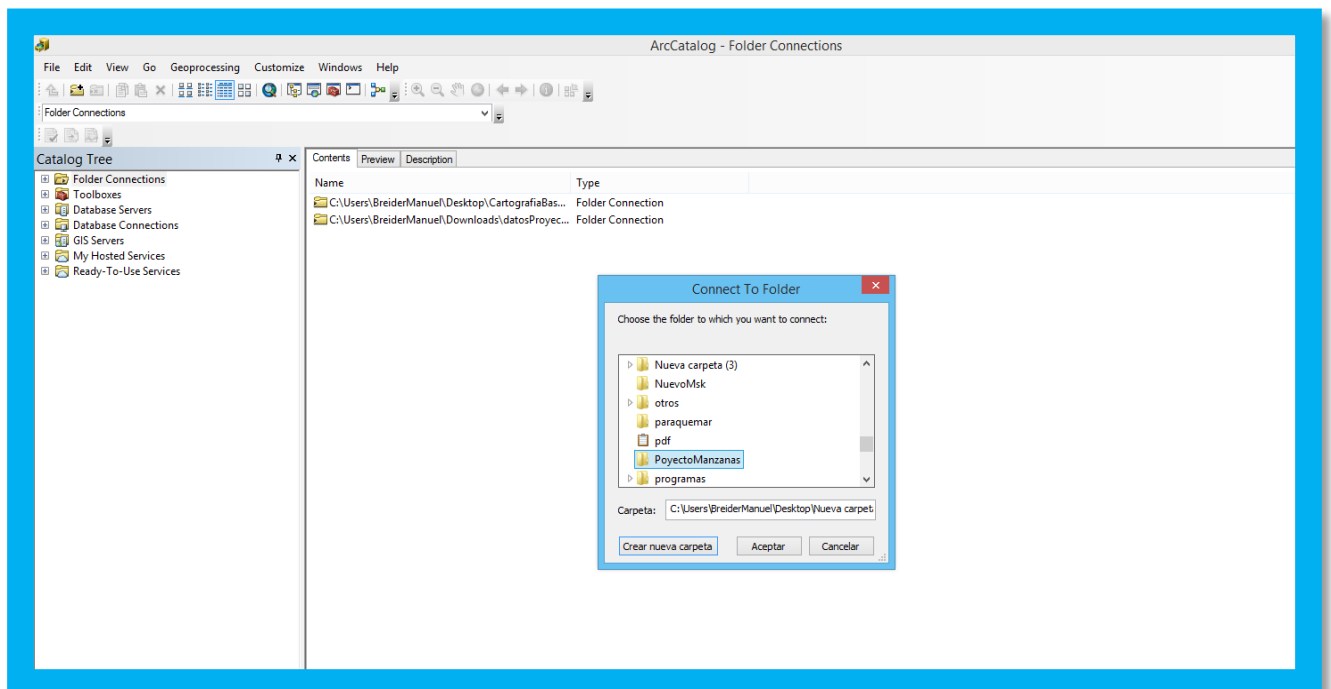
## Diseño físico FileGeoDataBase

### 1. Crear la Geodatabase con Arccatalog 10.x

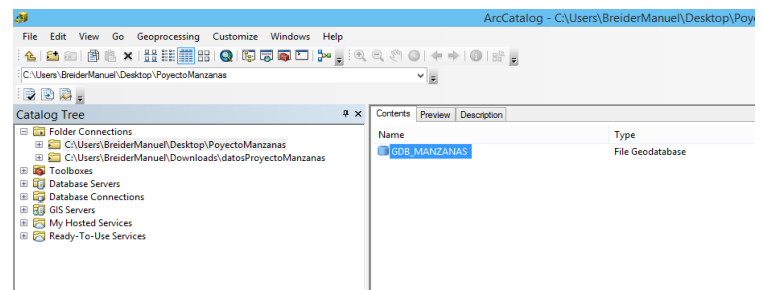
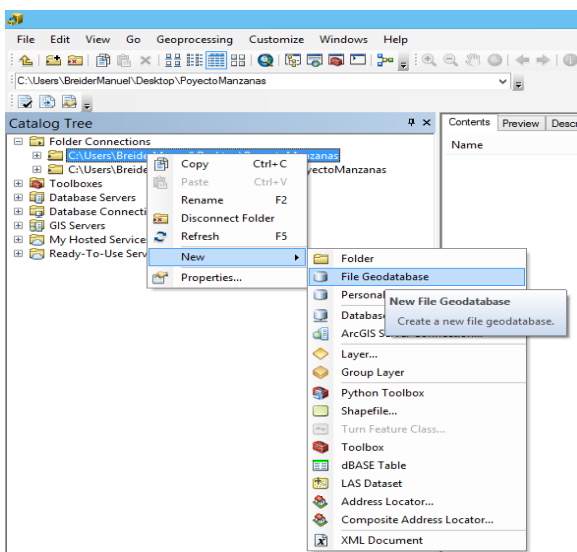
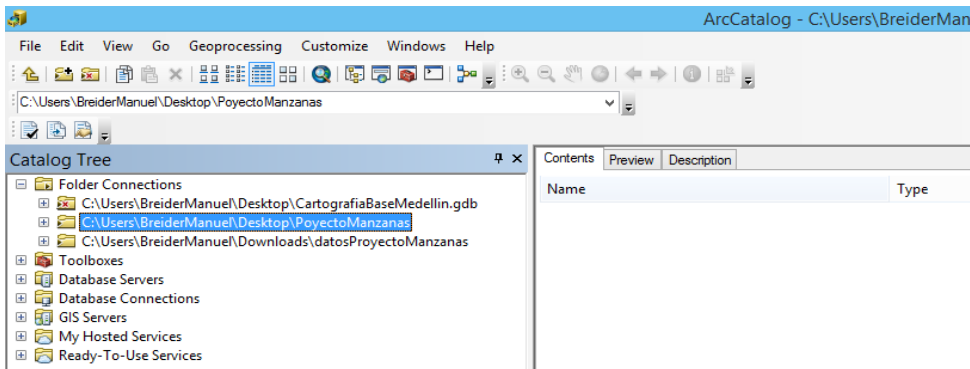
- a. Para crear una nueva carpeta se da clic en folder connection, se abrirá una nueva ventana en la cual se va a seleccionar la carpeta que contendrá nuestro proyecto o crea como una nueva carpeta.



La imagen contiene realidad aumentada



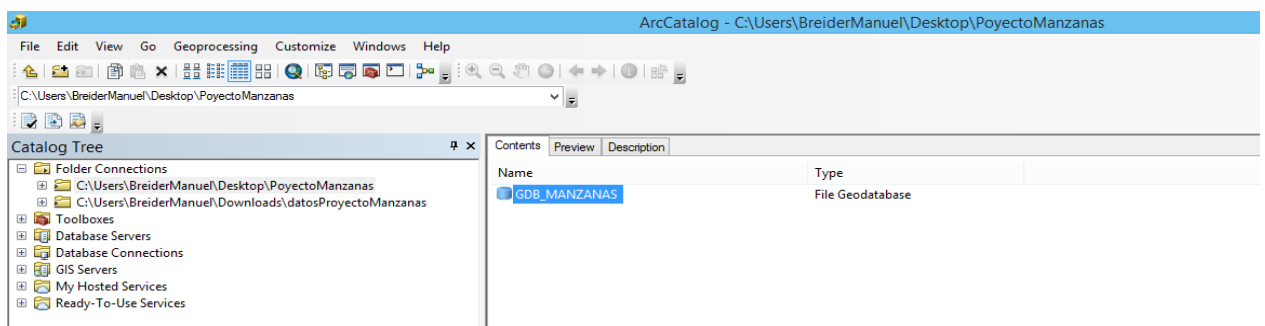
- b. Debajo de folder connection aparecerá la carpeta **creada**, se da clic derecho en esta y aparecerá una lista, se posiciona el cursor en **nuevo**, en donde se desplegará una nueva lista, allí debe darle clic a **File Geodatabase**.



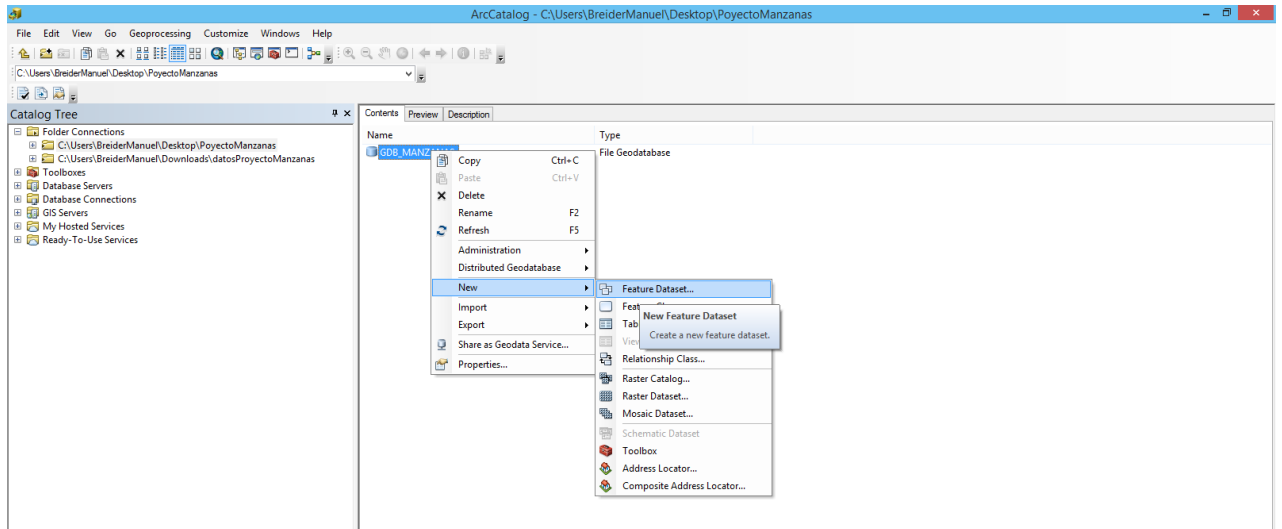
- c. Al lado derecho aparecerá resaltada la pestaña **contents**, escribimos el nombre **GDB\_MANZANAS** de nuestro archivo (File Geodatabase).

## 2. Crear Feature Dataset

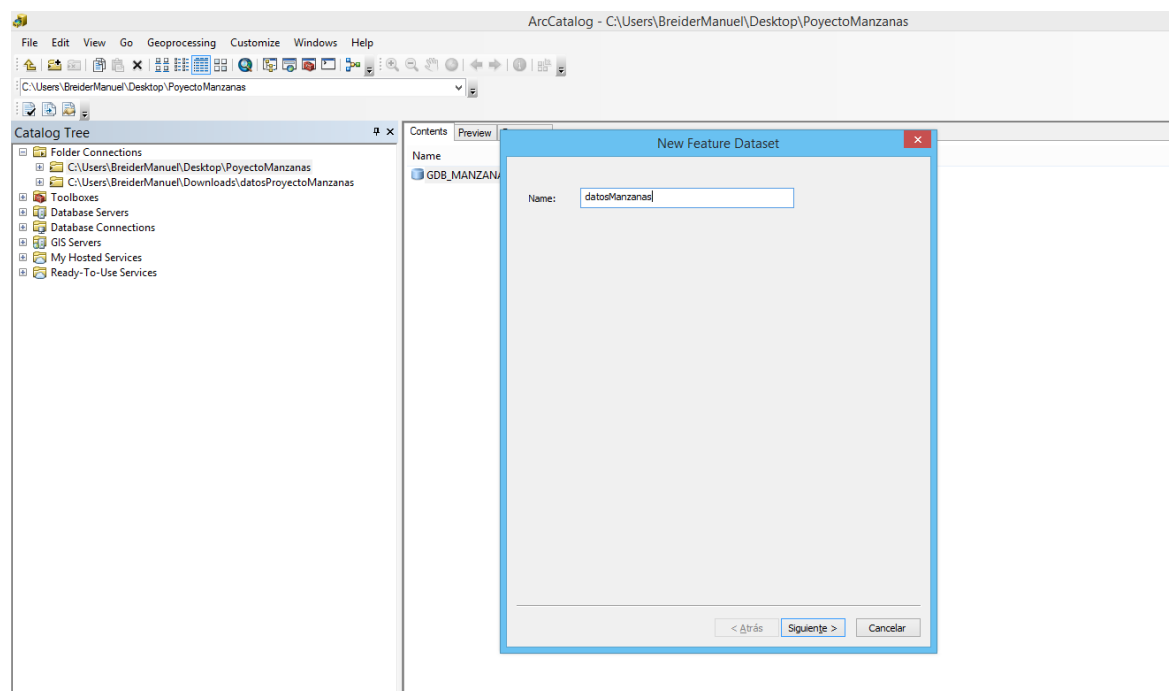
Para crear *Feature Dataset* hay que importar el sistema de coordenadas de los elementos espaciales que ya se tienen.

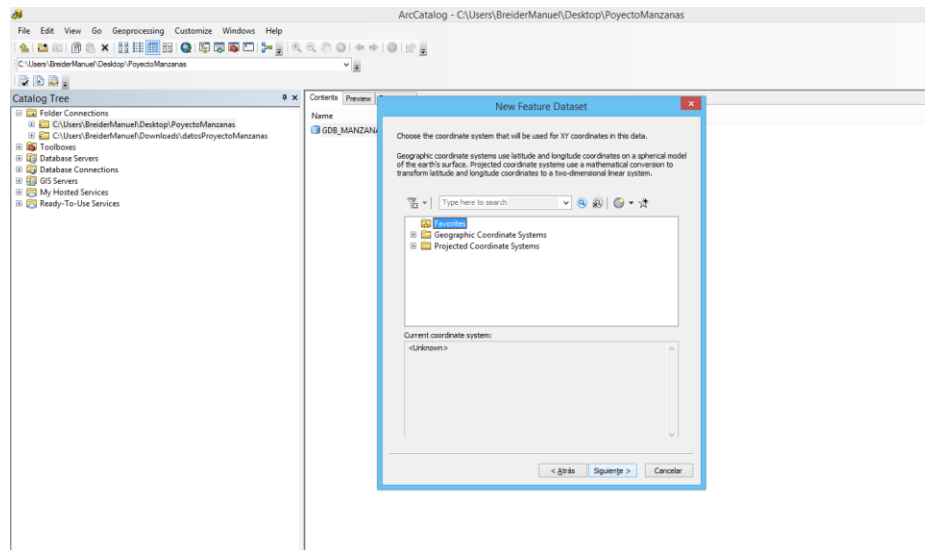


- a. Le damos clic derecho a nuestro File Geodatabase y se posiciona el cursor en **New**, se desplegará una lista en donde se debe dar clic en **Feature Dataset**

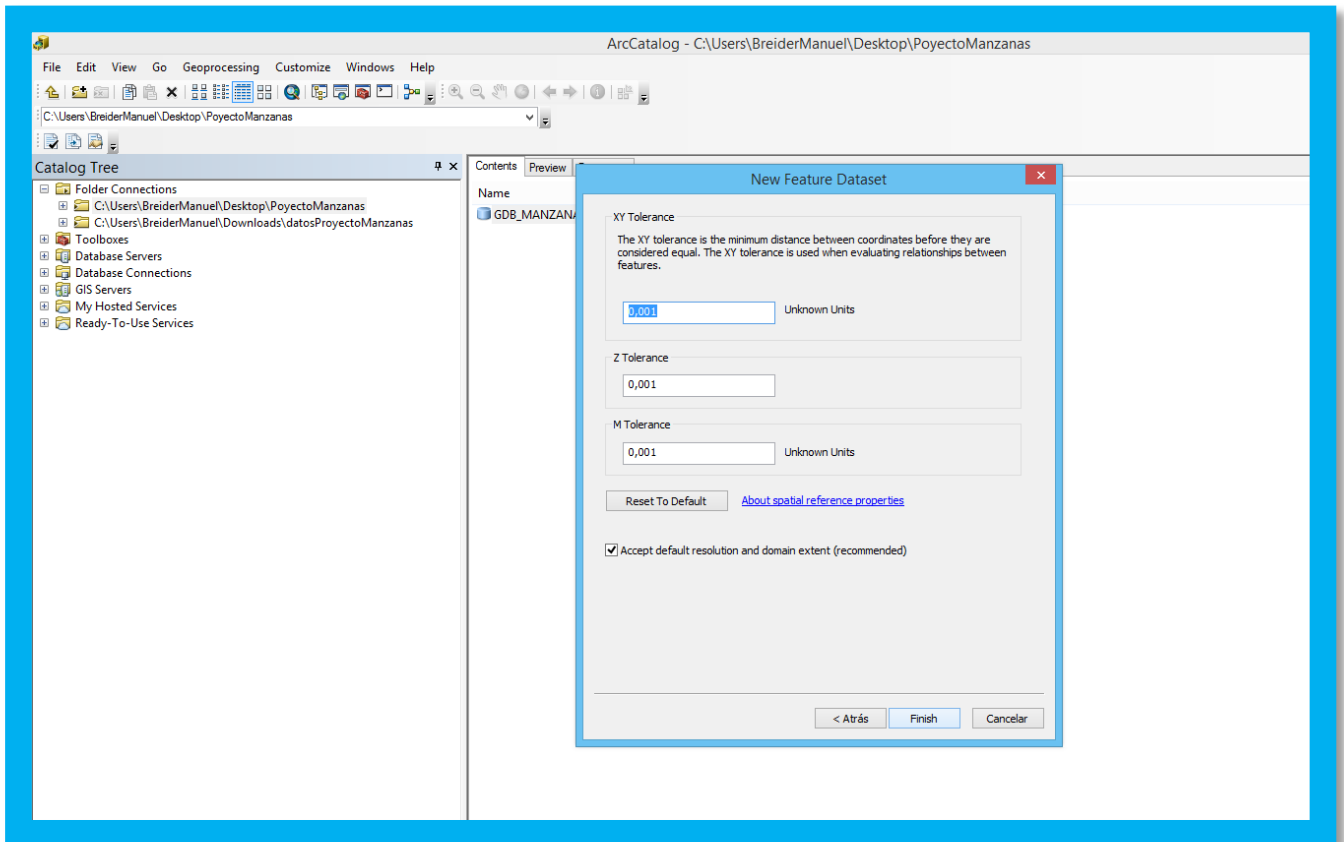


- a. Luego de dar clic se abrirá una ventana en donde se debe digitar el nombre **datosManzanas** a nuestro **Feature Dataset**, se da clic en **siguiente** y saldrá una nueva ventana en donde se debe dar clic en **favoritos** y luego clic en **siguiente**, se debe dar clic en aceptar el dominio existente y por último dar clic en **finish**.





La imagen contiene realidad aumentada



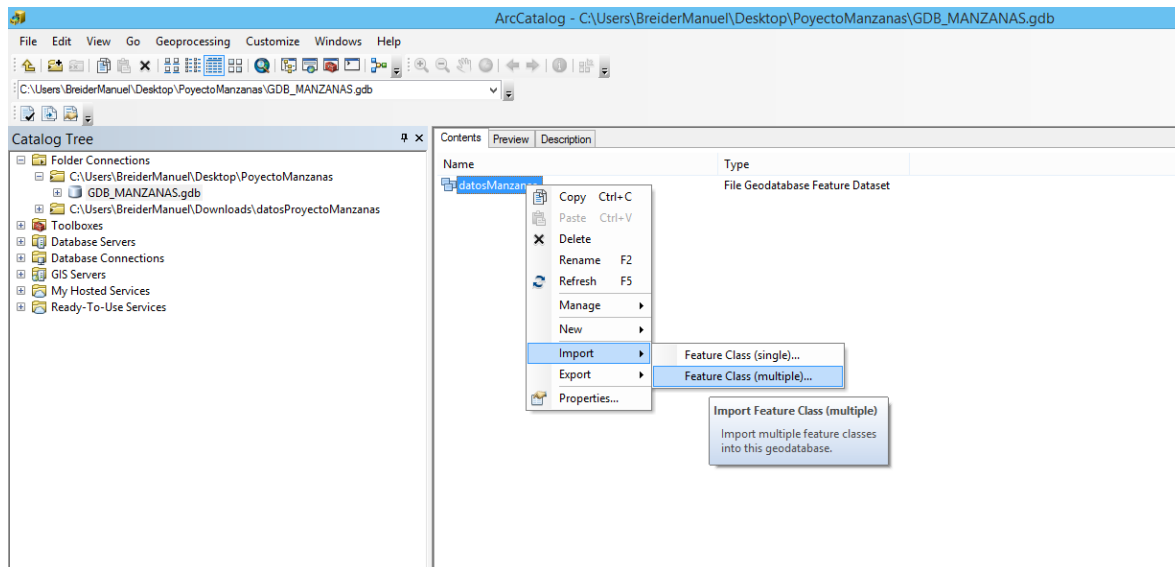
Y así creamos una Feature Dataset.



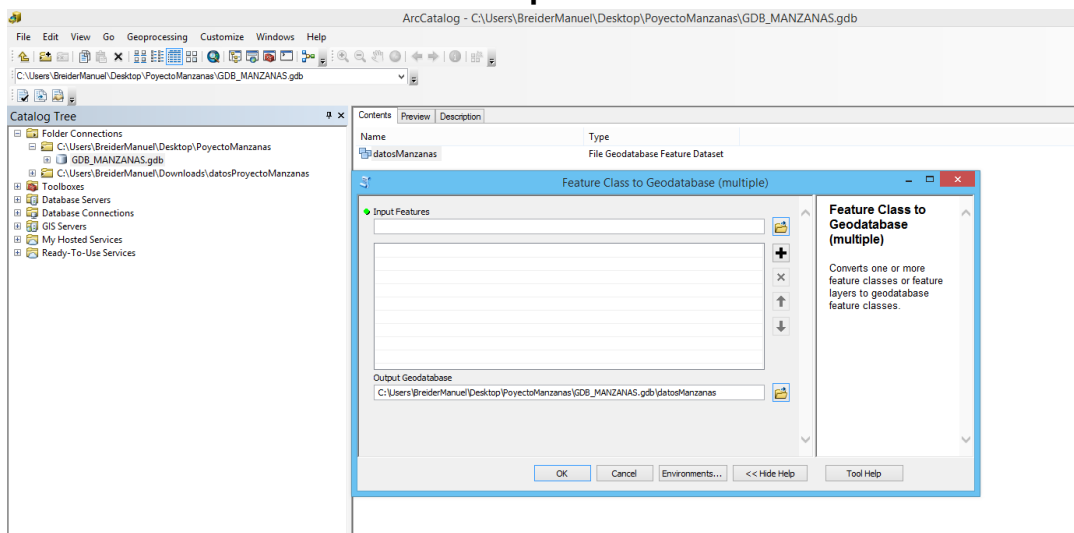
### 3. Importar los datos

Después de crear nuestra Feature Dataset, procedemos a importar los datos.

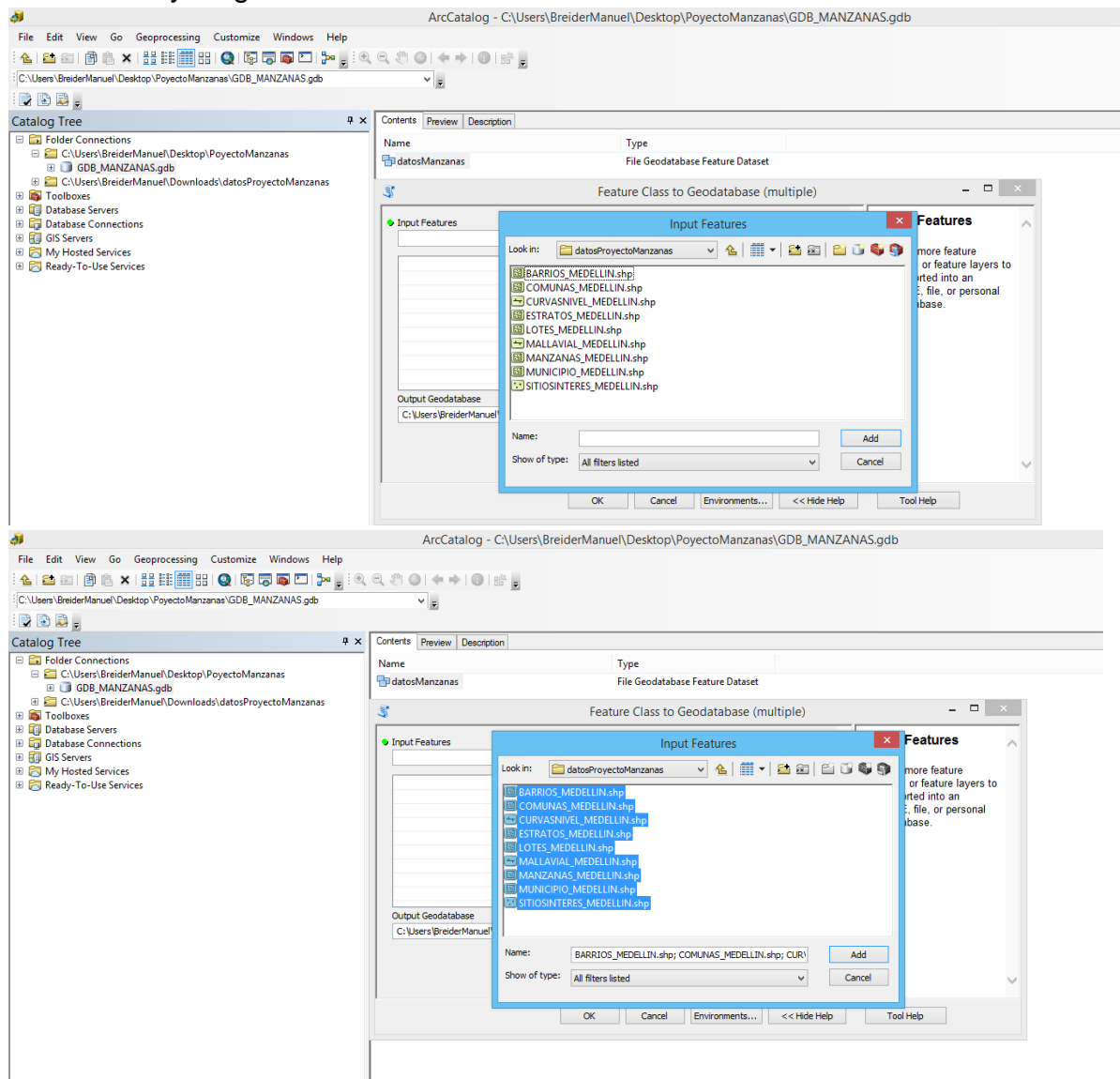
- a. En nuestro Feature Dataset llamado **datosManzanas**, lo seleccionamos y se debe dar clic derecho y posicionar el cursor en **import**, se desplegará una lista en donde se debe dar clic en **Feature Class (multiple)** **(multiple)**...



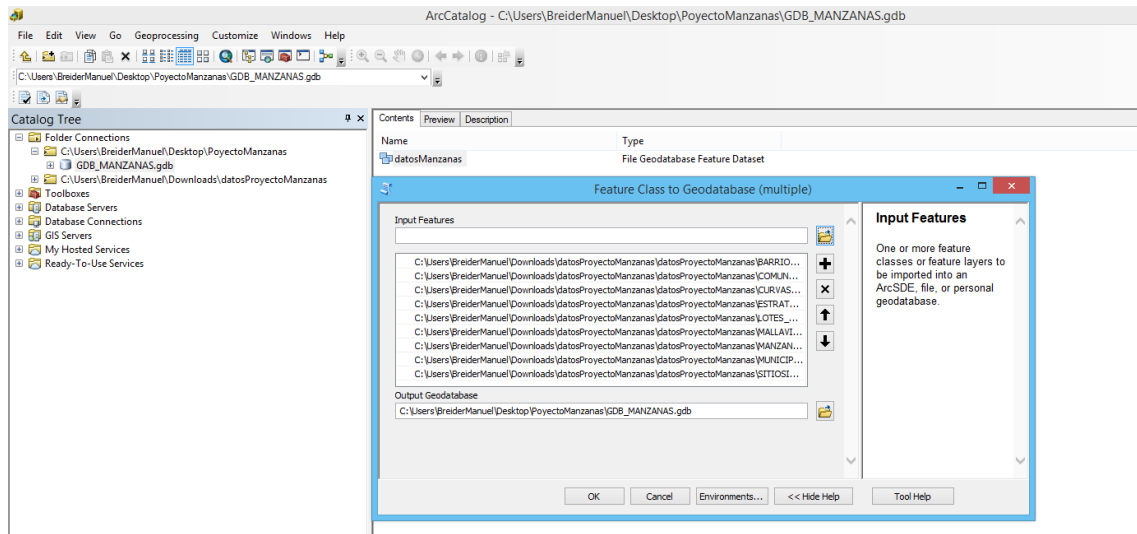
- b. Sobre el mismo archivo **datosManzanas**, se debe dar clic y se abrirá una ventana nueva; se debe dar clic en el **icono de carpeta**, sobre esta se abrirá una nueva ventana llamada **input Feature**.



- c. donde buscamos todos los datos que vamos a importar, se deben seleccionar y luego dar clic en **Add**.

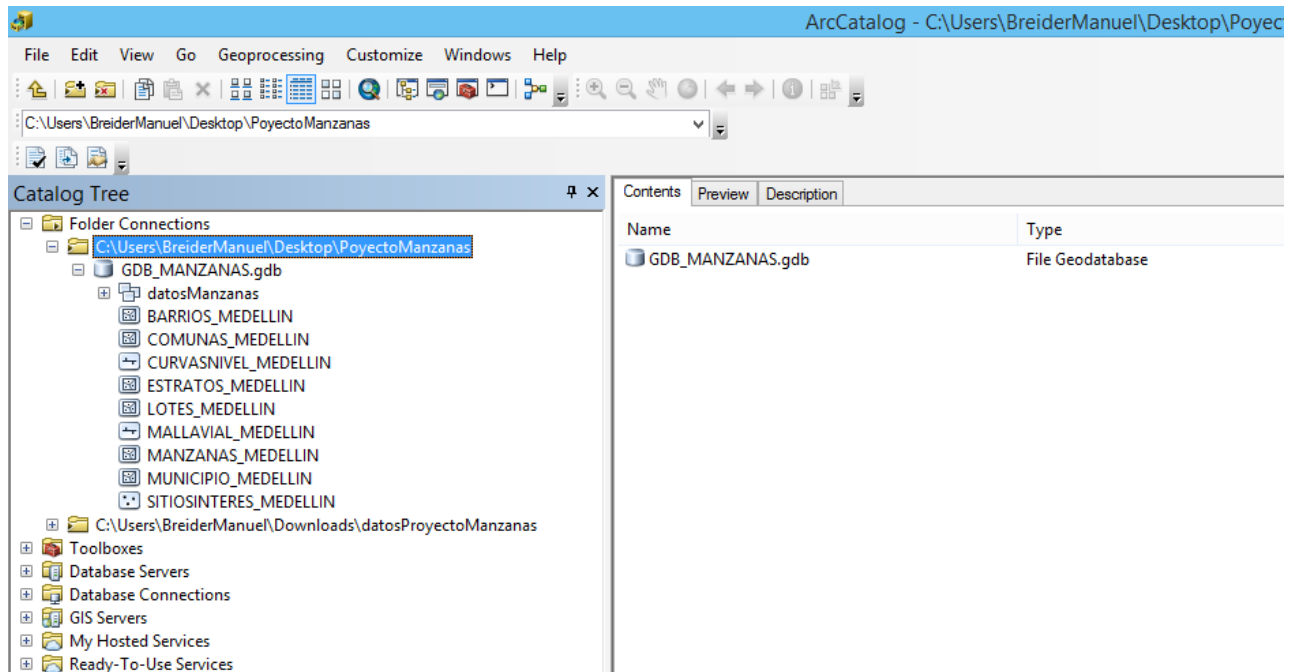


Esto permitirá que aparezca en la ventana de Feature Class, la lista seleccionada, por último, se da clic en **ok**.



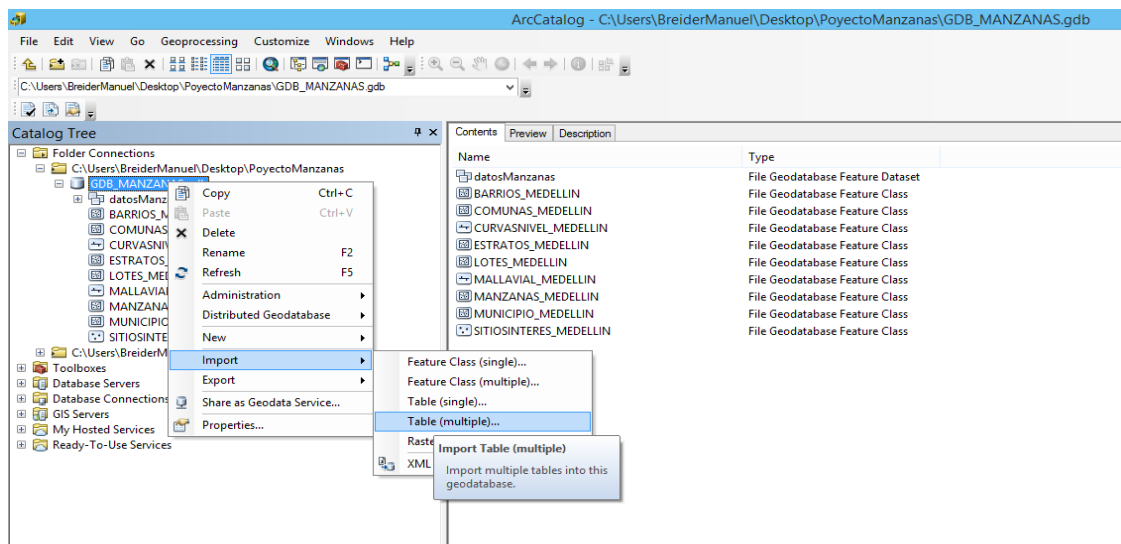
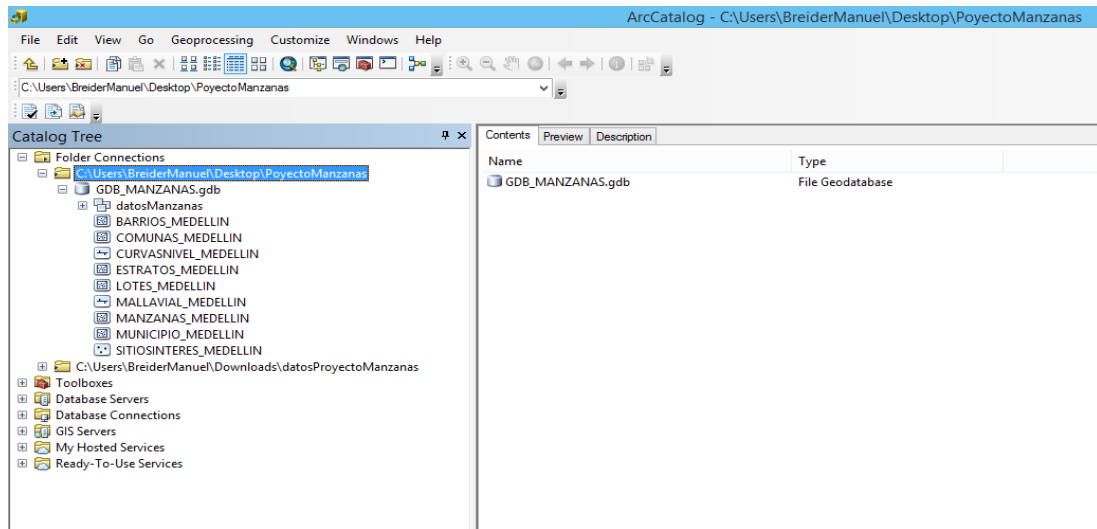
#### 4. La FileGeodataBase

La FileGeodataBase quedaría así:

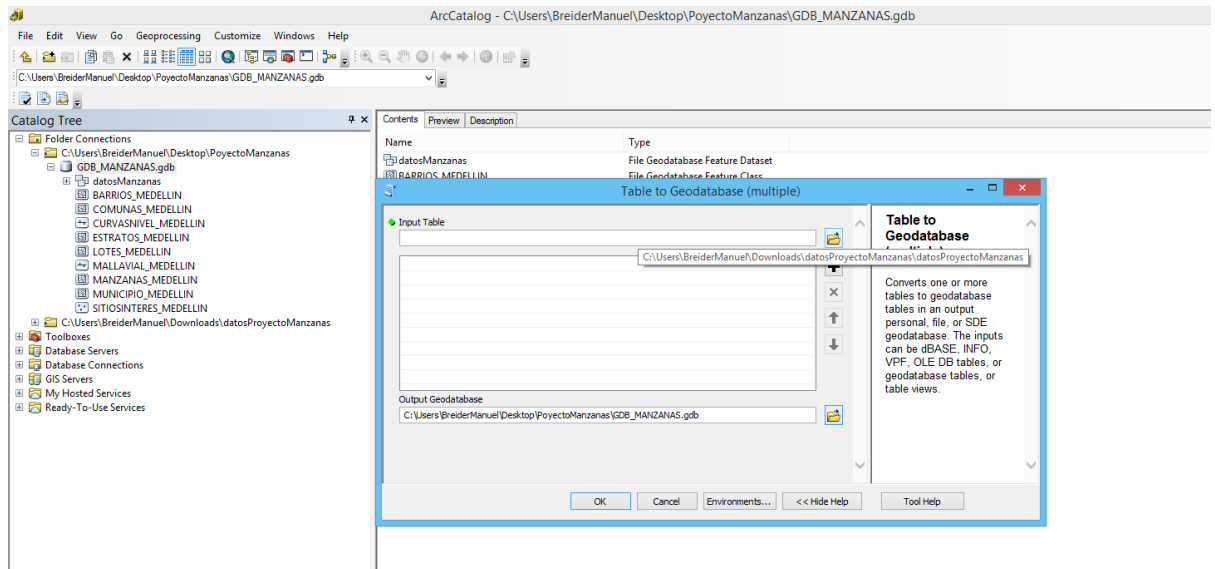


#### 5. Importar la tabla responsables.

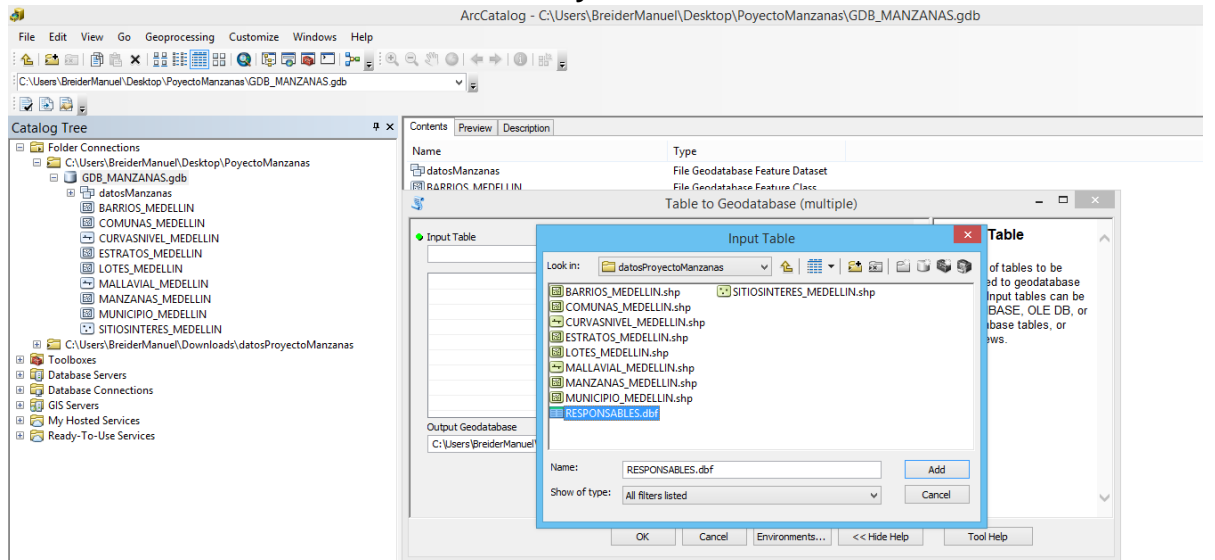
- a. Le damos clic derecho a nuestro archivo FileGeoDataBase **GDB\_MANZANAS.gdb**, se posiciona el cursor sobre **import**, lo cual desplegará una nueva lista en donde se debe dar clic en **Table (multiple)**...



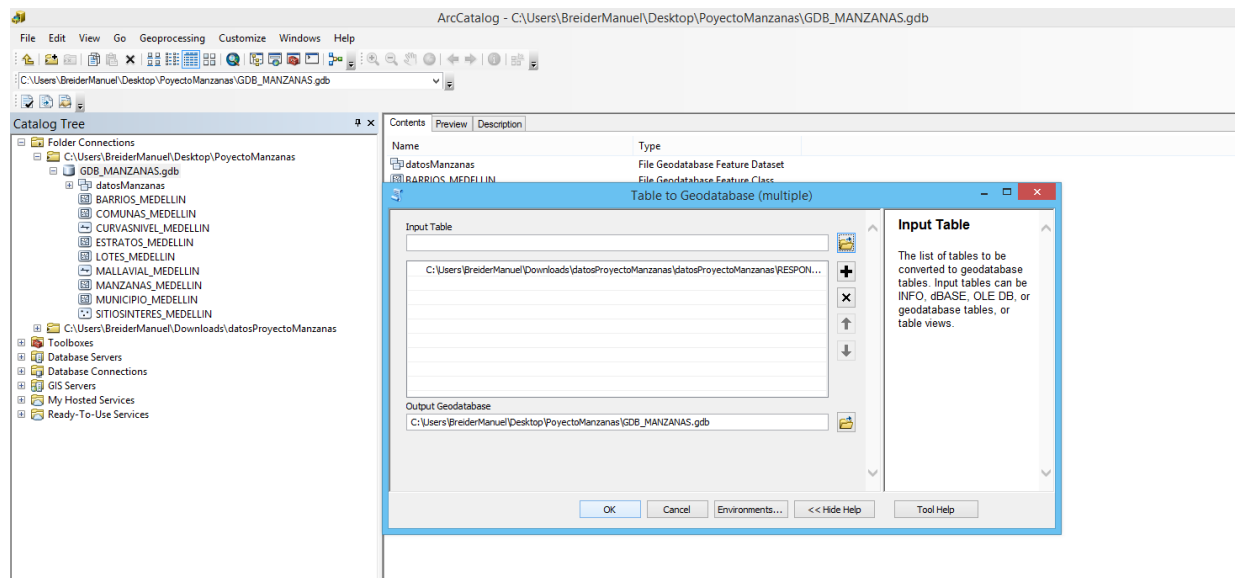
b. Esto abrirá una nueva ventana, **donde** debe dar clic en el **icono carpeta**.



- c. Se abre otra ventana con la lista de los archivos a importar, buscamos el archivo llamado **RESPONSABLES.dbf** y le damos clic en **Add**.



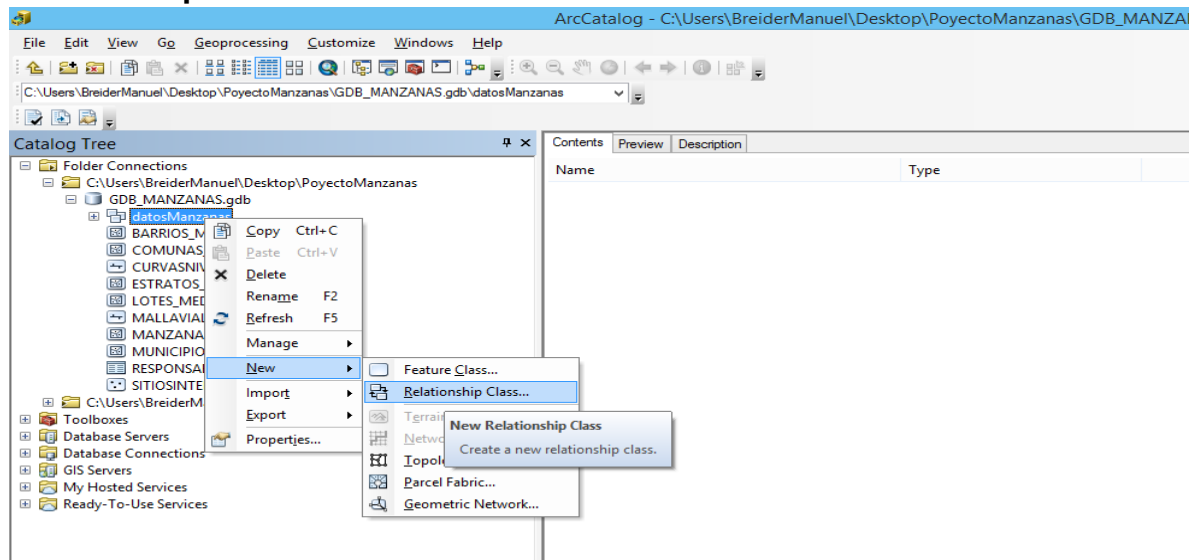
- d. Esto permitirá que aparezca en la ventana lo seleccionado, por último, se da clic en **ok**.



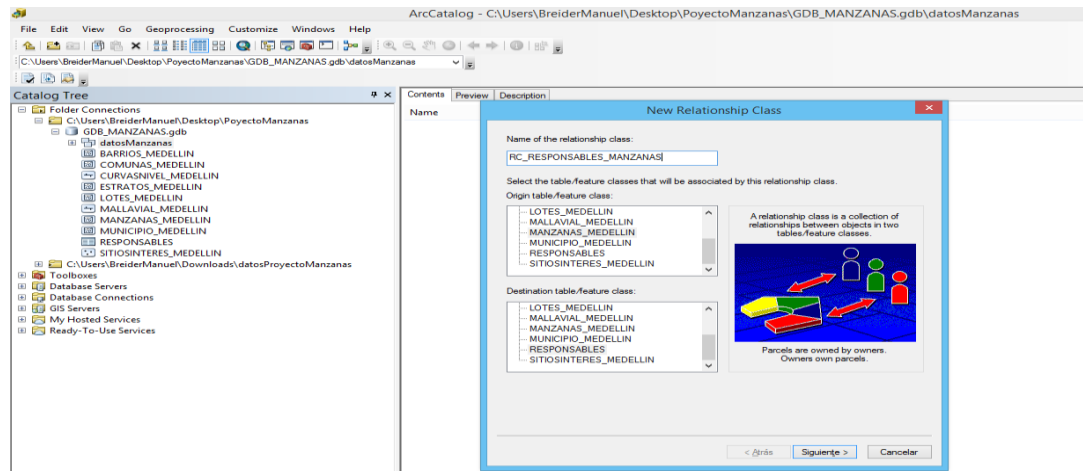
## 6. Crear Relationship Class

Para crear una Relationship Class seguimos los siguientes pasos.

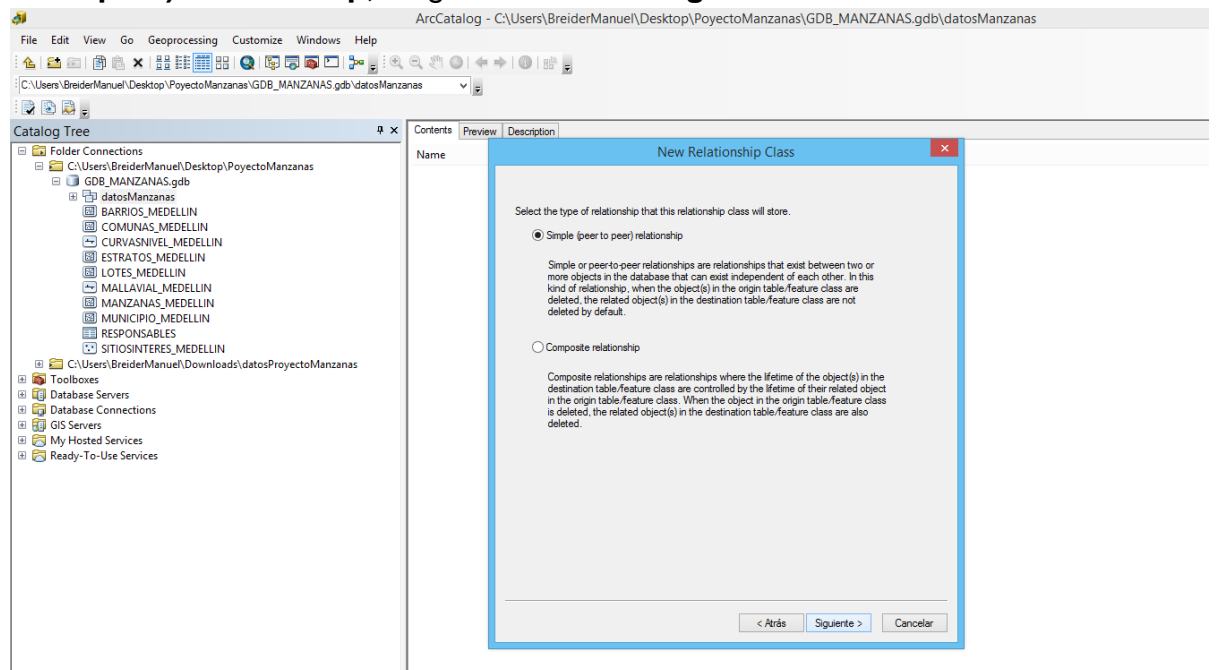
- a. Le damos clic derecho a nuestro archivo Feature Dataset **datosManzanas** y nos posicionamos en la opción **new** donde le damos clic en **Relationship Class...**



- d. Esto abrirá una ventana llamada **new Relationship class**, en la primera casilla escribimos el nombre que se le va a dar **RC\_RESPONSABLES\_MANZANAS** y se da clic en **siguiente**.

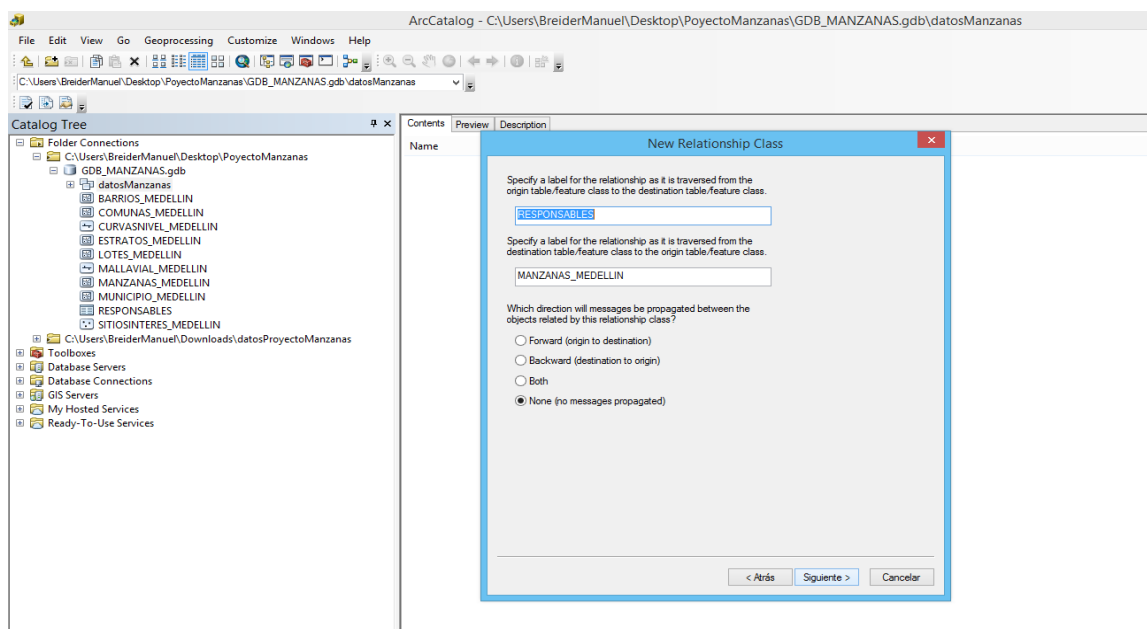
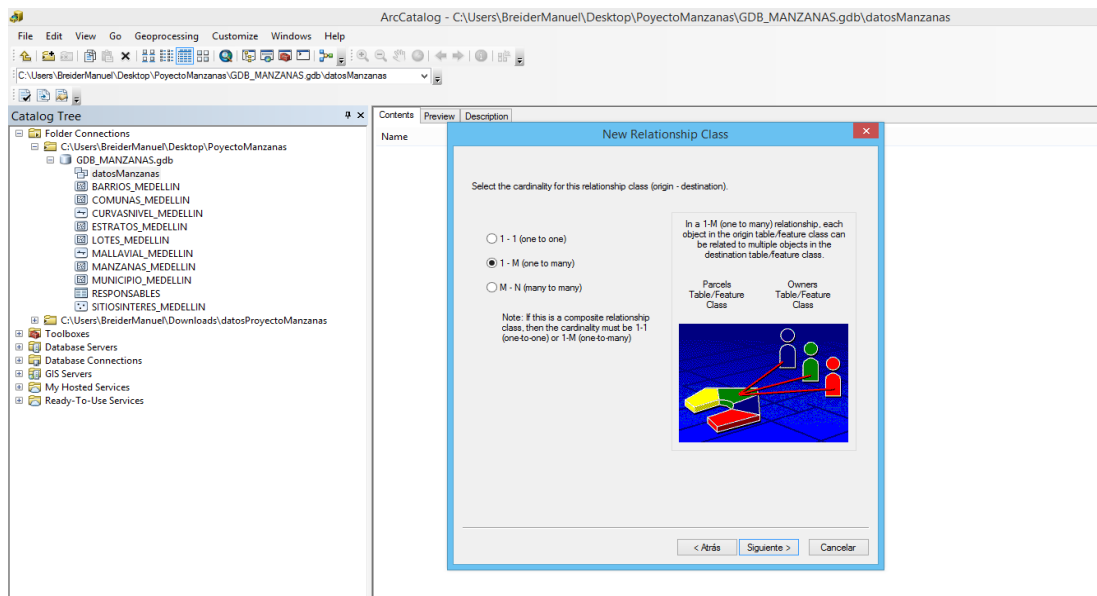


- e. se abre una nueva ventana en donde se debe dar clic en **simple (peer to peer) relationship**, luego se da clic en **siguiente**.



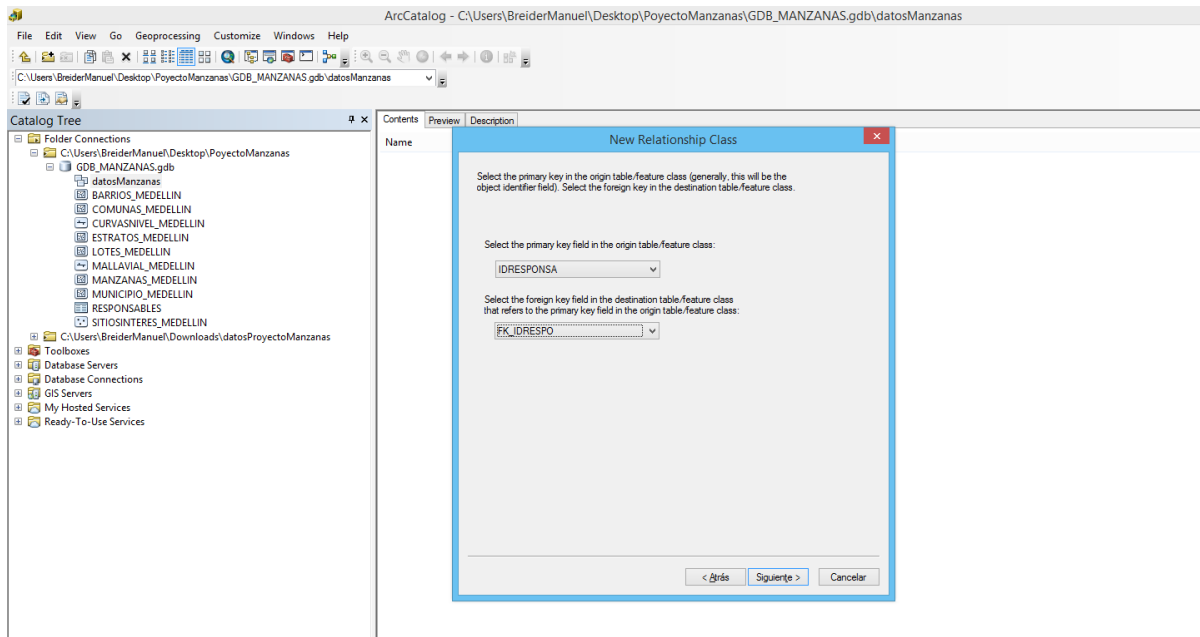
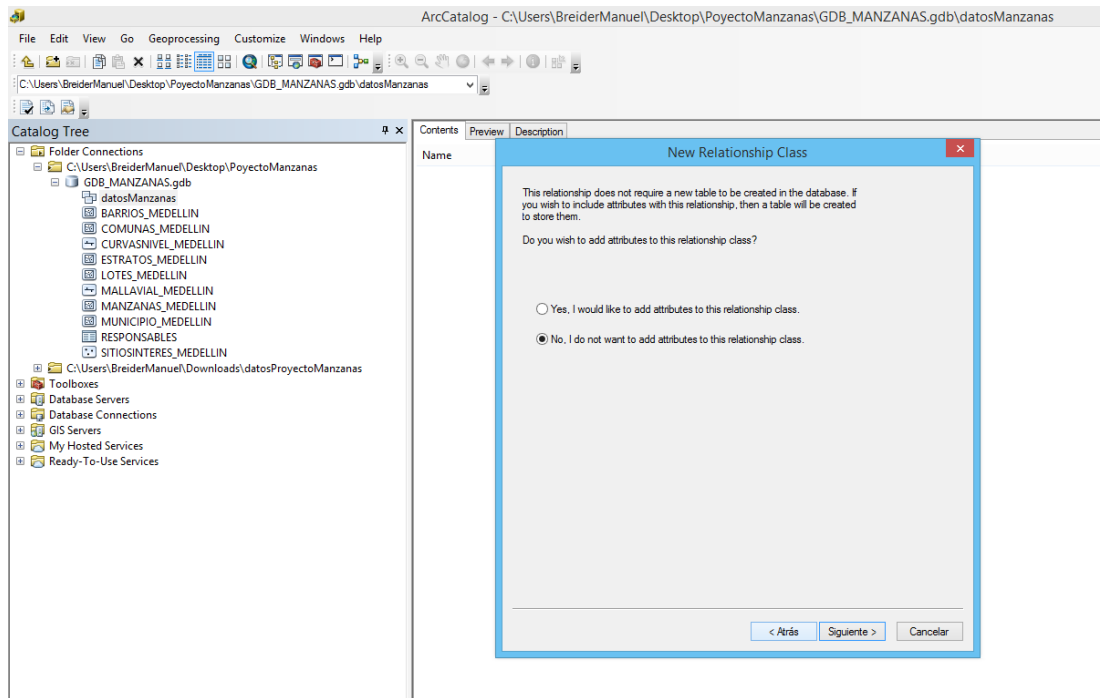
- i. se abre una nueva ventana en donde se debe dar clic en la segunda opción llamada **1-M (one to many)**, se da clic en **siguiente**, esto abre una nueva ventana en donde se digitará en la primera casilla la palabra **RESPONSABLES** y en la segunda casilla se digita

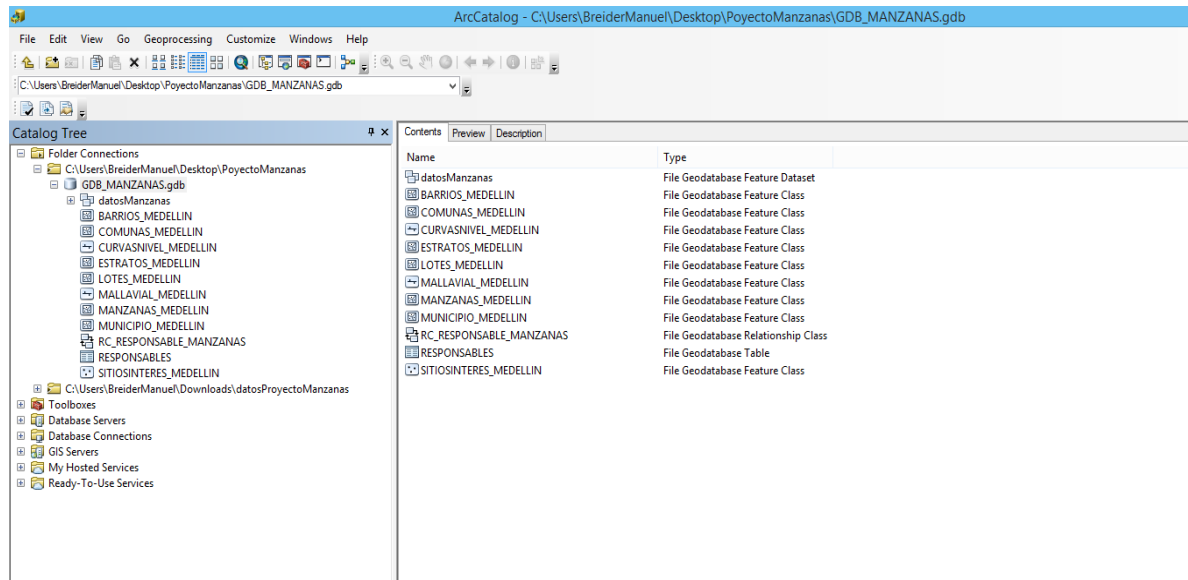
**MANZANAS\_MEDELLIN**, mas abajo se da clic en la opción 4 llamada **none (no messages propagated)**, luego se da clic en **siguiente**.



- f. Se muestra una ventana en donde se da clic en **No, I do not want to add attributes to this relationship class**, clic en **siguiente**, en la nueva ventana que aparece, en la primera casilla se selecciona la palabra **IDRESPONSA** y en la segunda casilla la palabra **FK\_IDRESPO**, se da clic en **siguiente**. Saldrá la lista realizada.

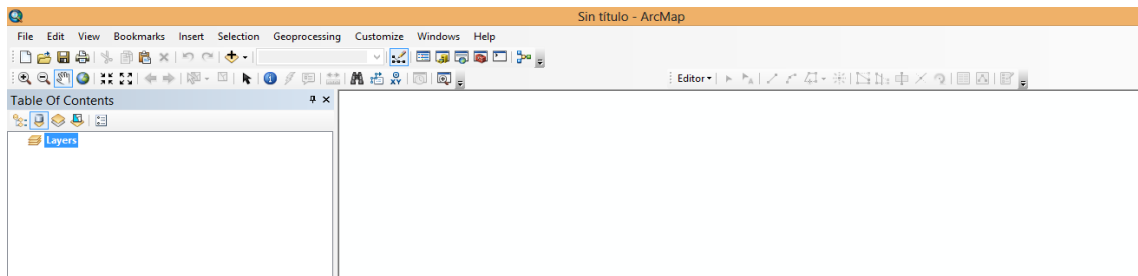




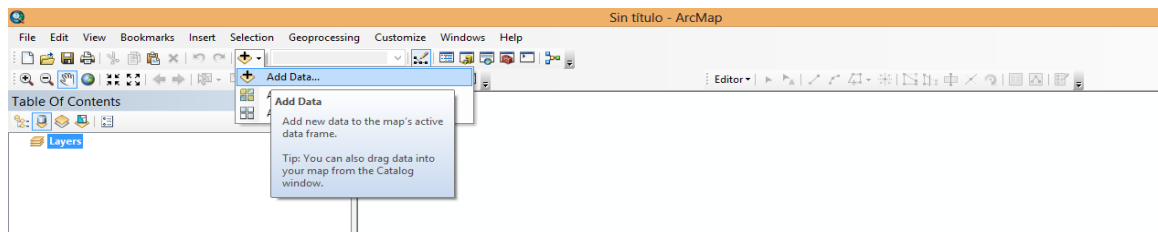


## Cargar la base de datos espacial (geodatabase) en arcmap 10.2.

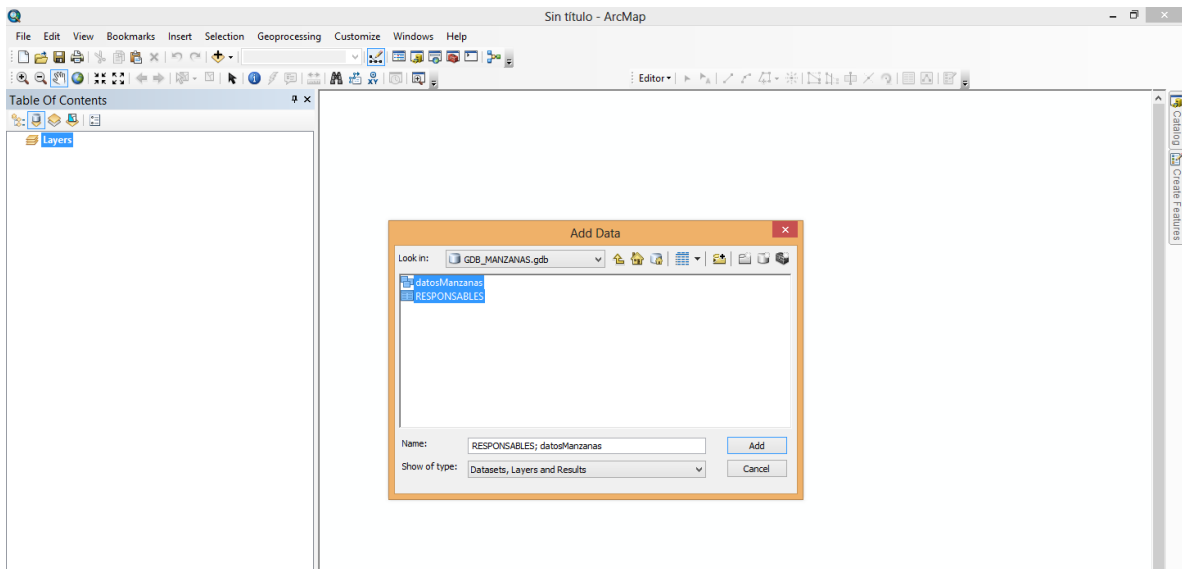
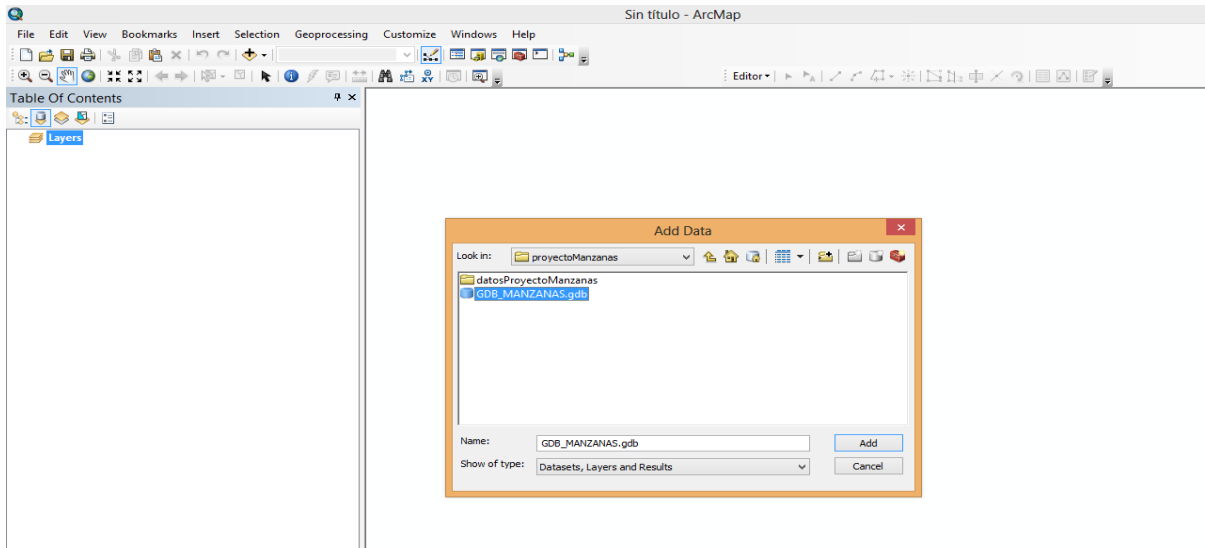
Usaremos Arcmap para realizar la consultas.

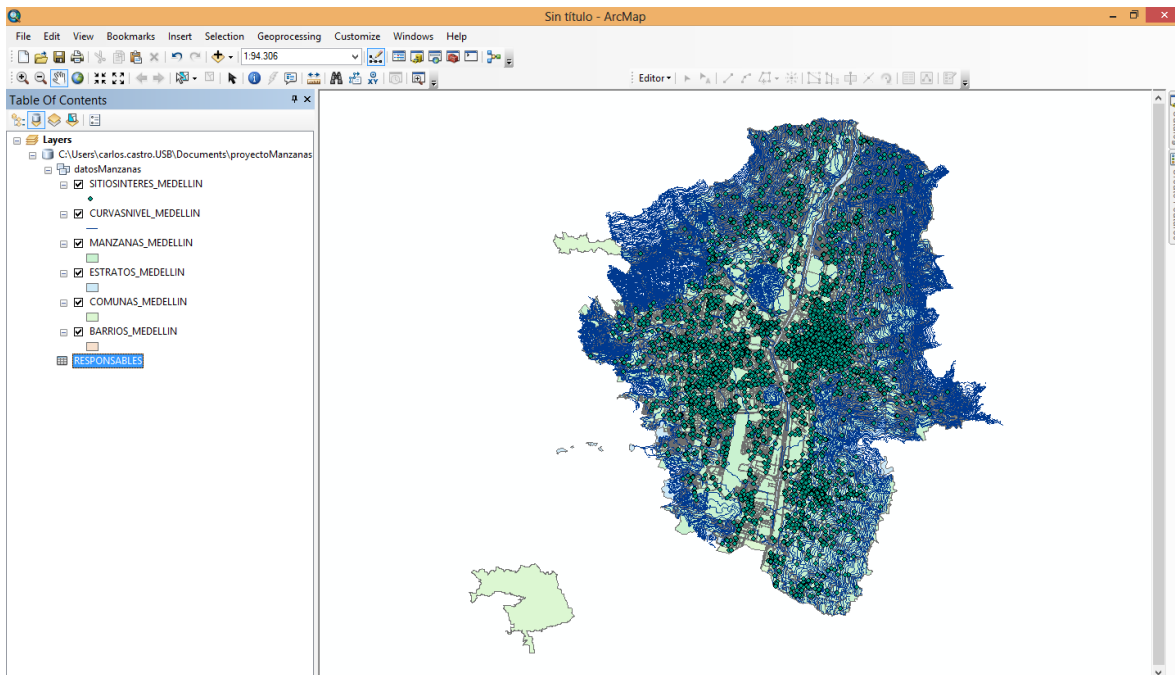


Navegamos en el menu y seleccionamos el icono de un mapa con un mas, y le damos en **Add Data**

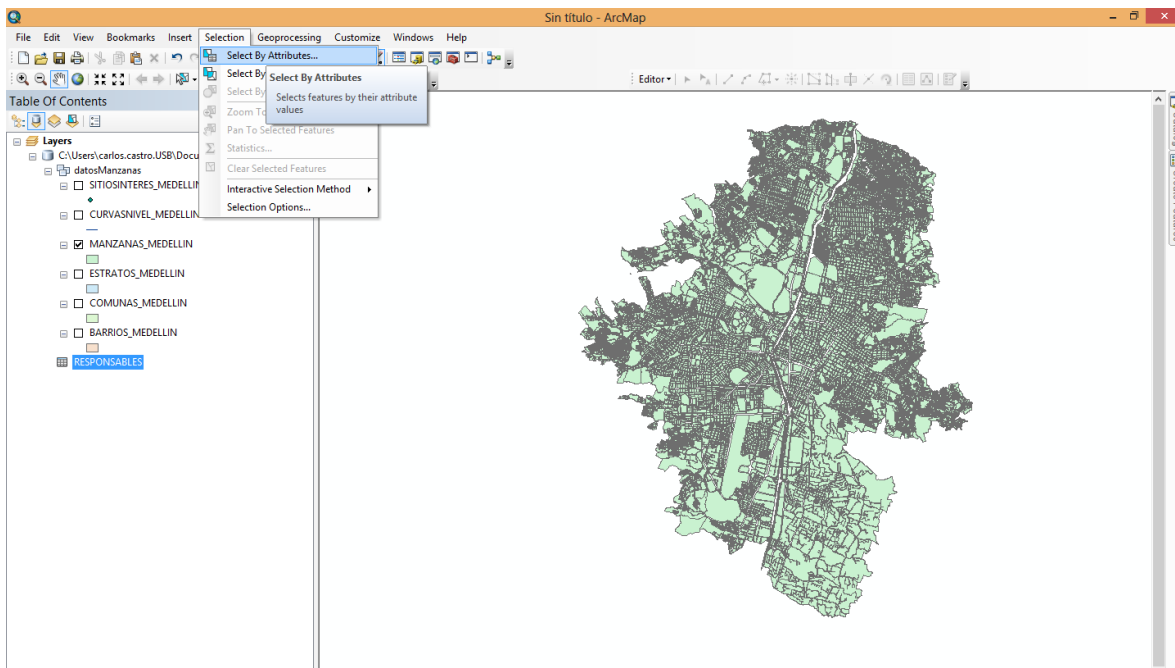


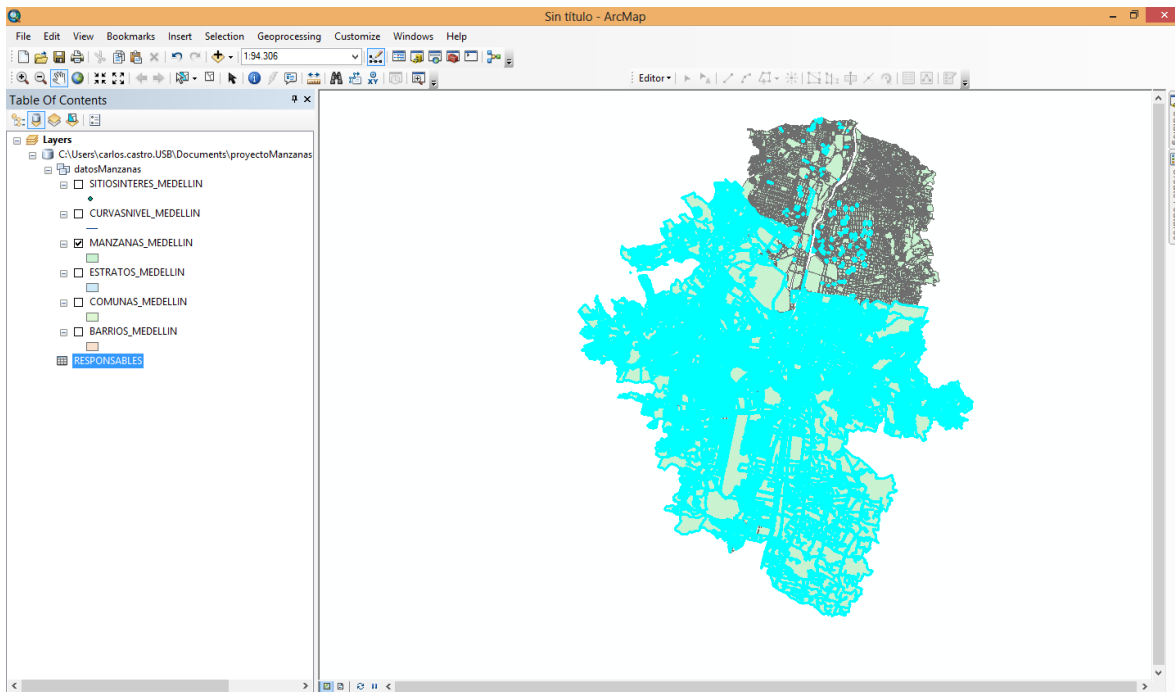
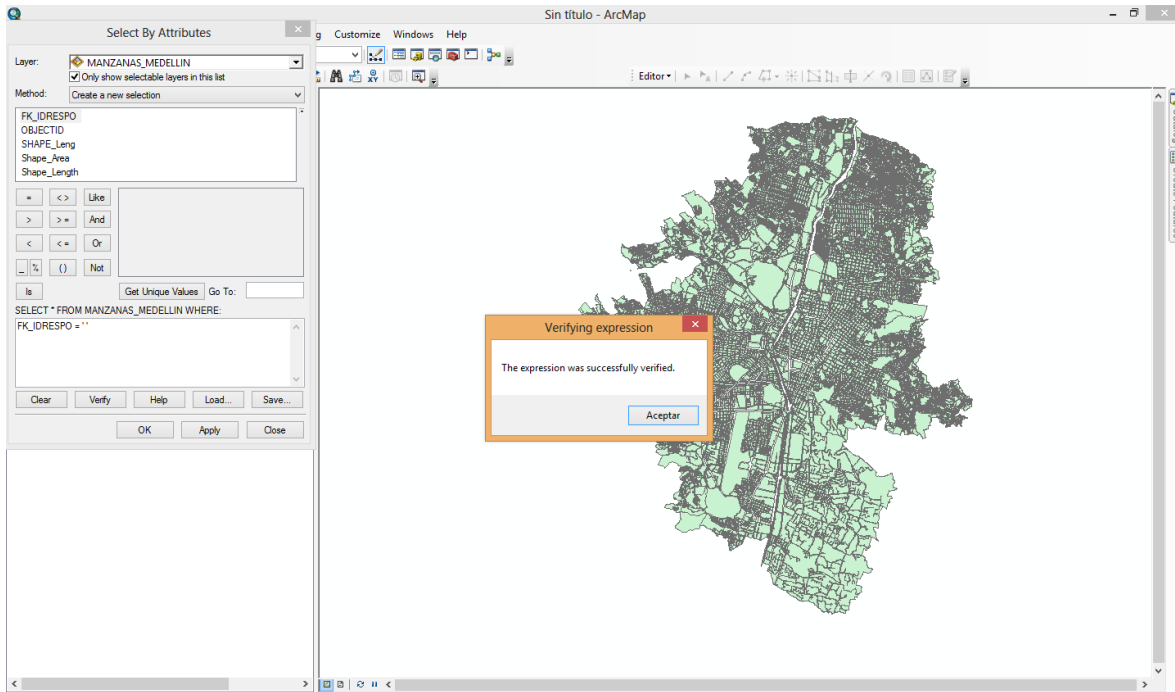
Buscamos la carpeta donde creamos nuestro FileDataBase y le damos doble clic para poder agregar nuestro Feature Dataset y la tabla de responsables.

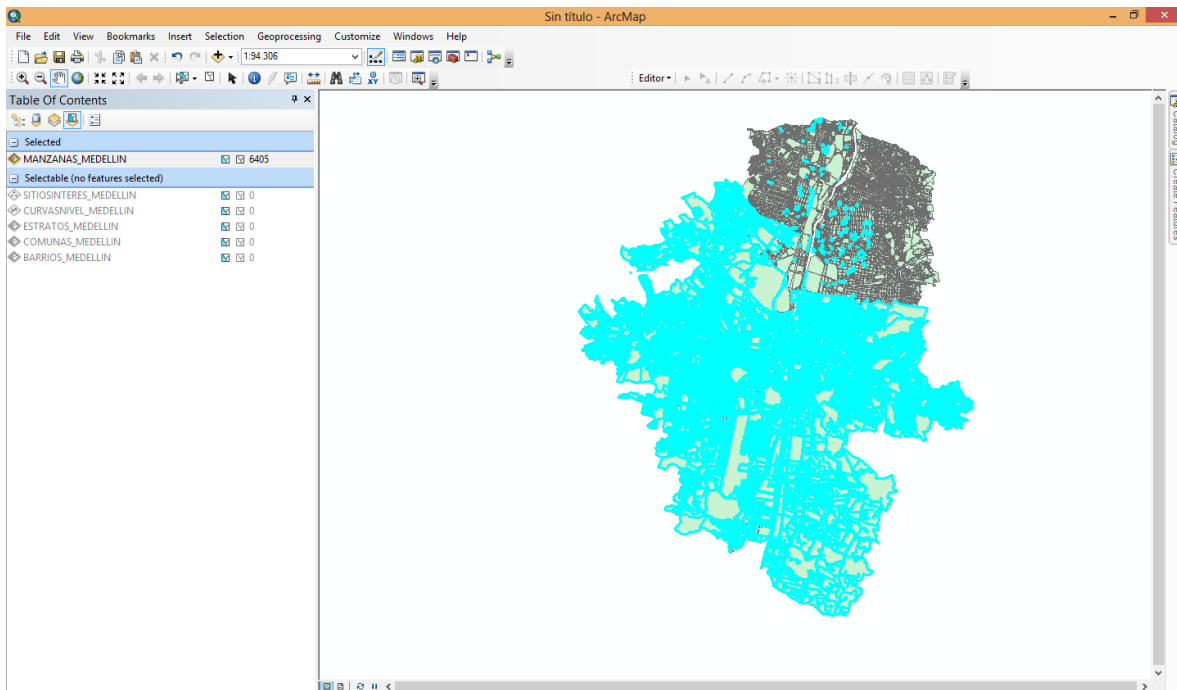
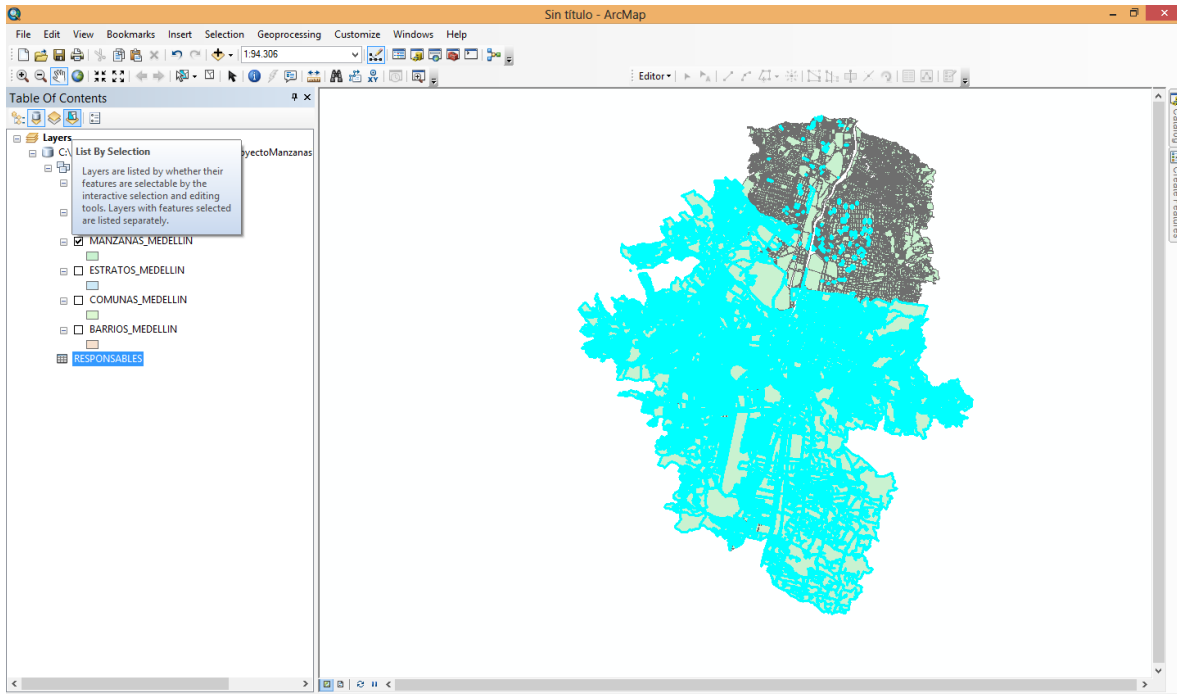


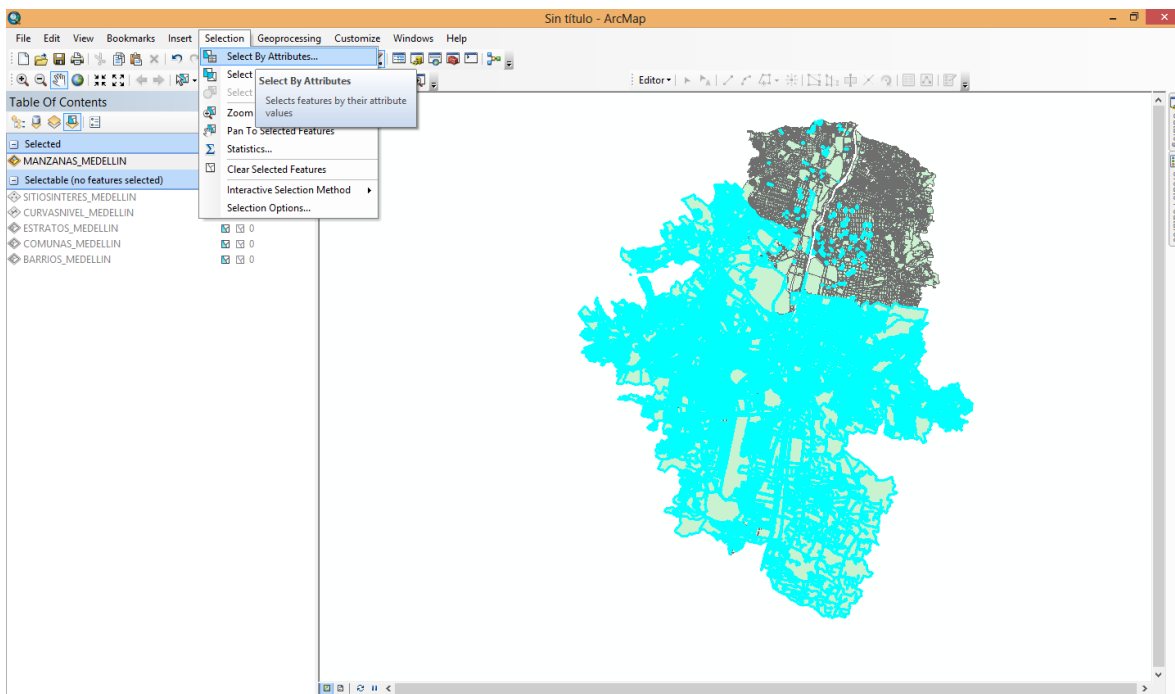
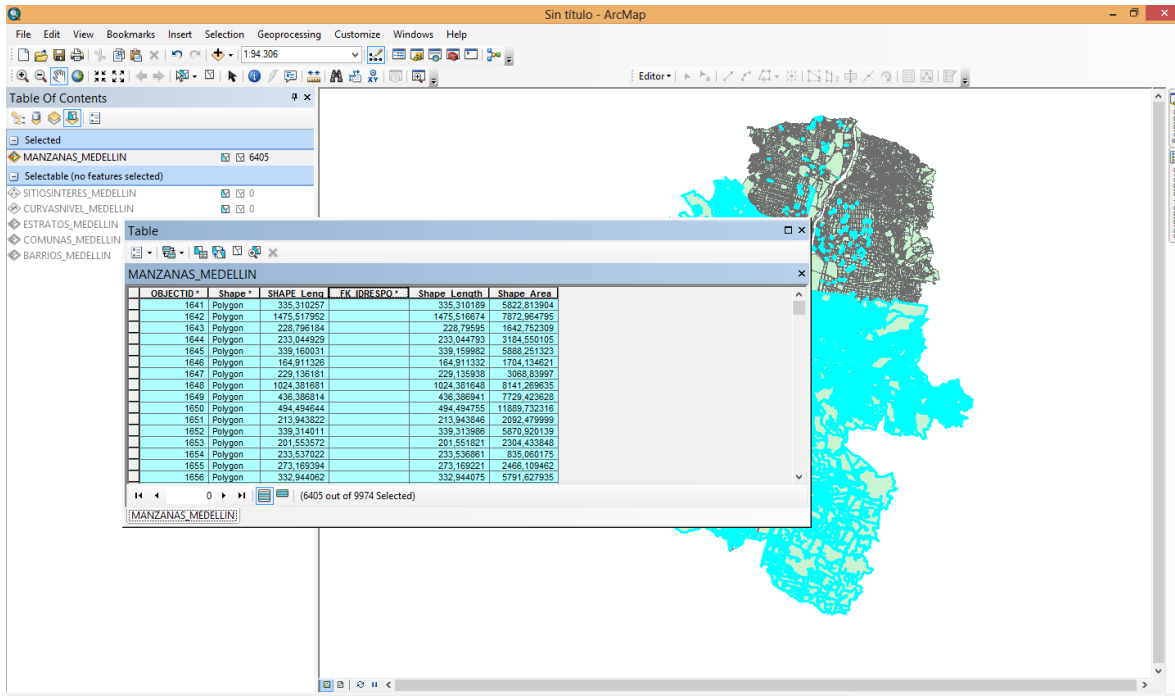


Mostrar las manzanas a las que no les han asignado responsable, que interceptan estratos 1, 2 ó 3 y que se encuentran a una altura entre 1650 y 1750 metros

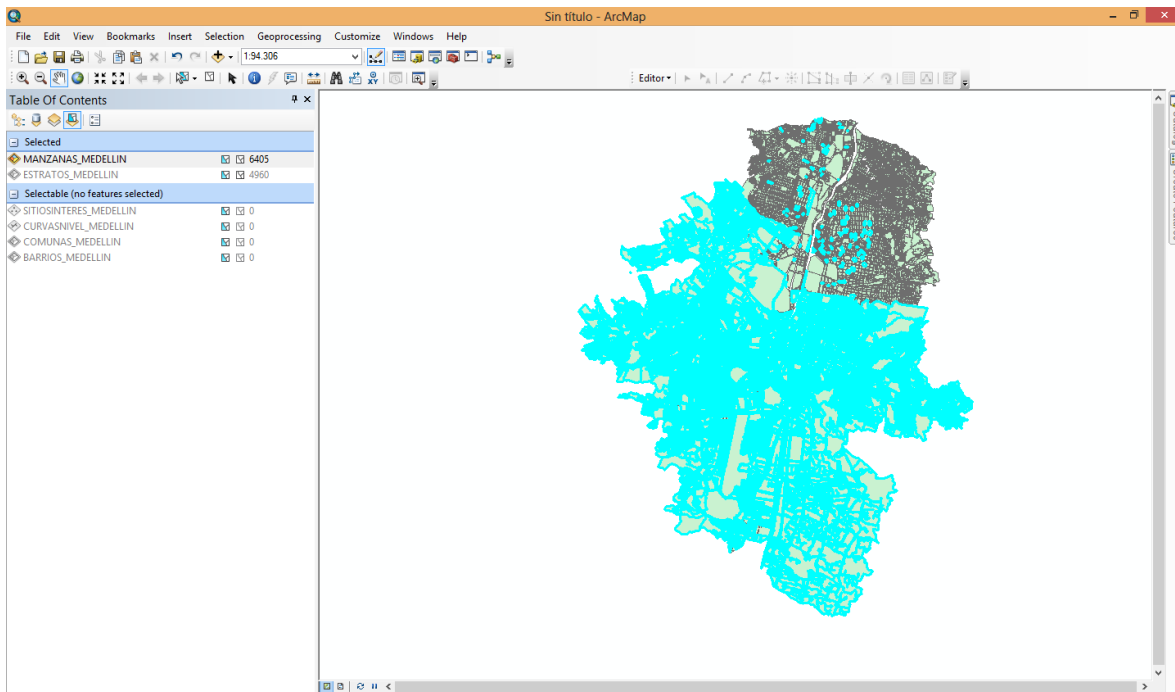
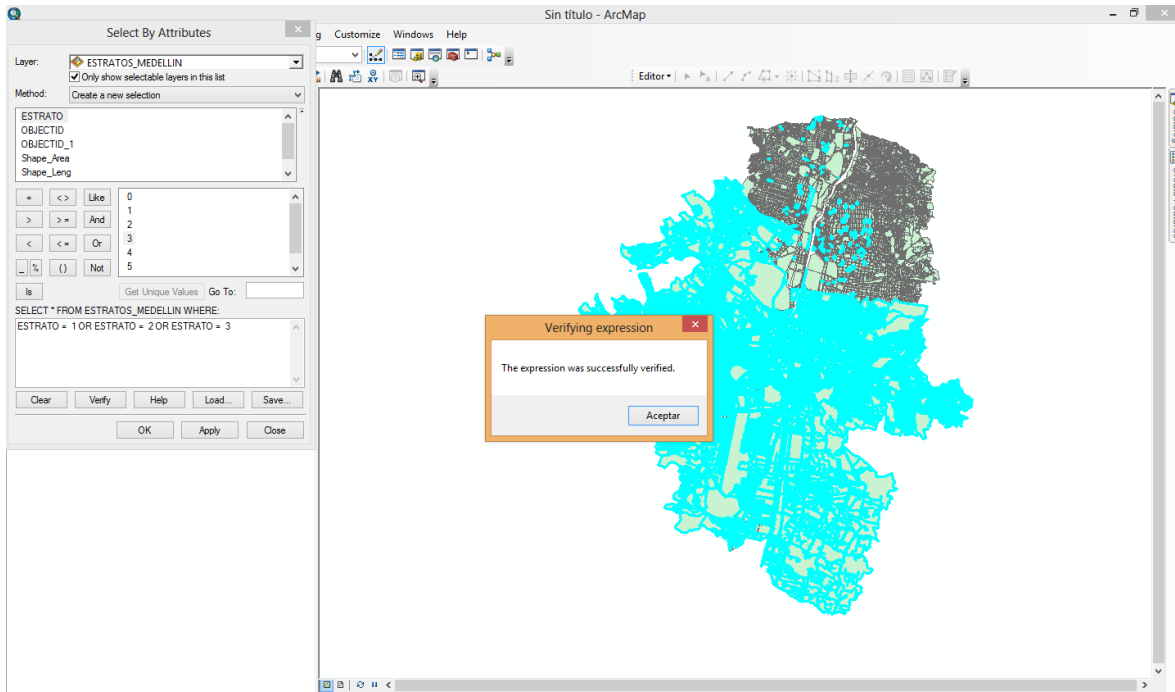


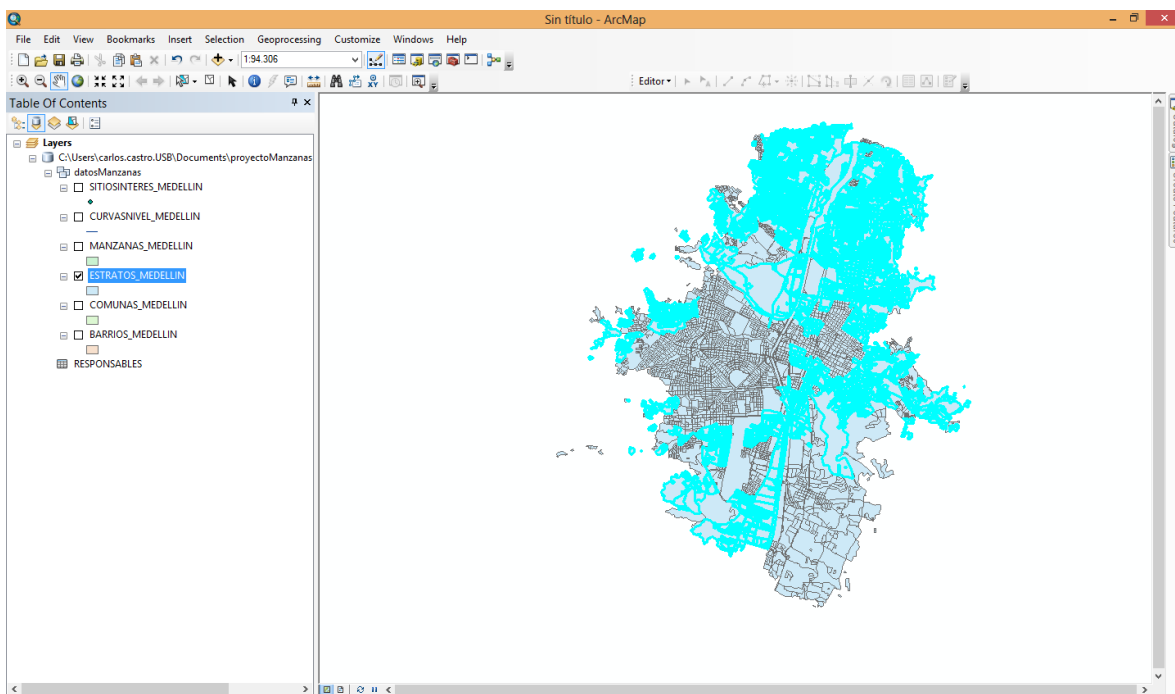
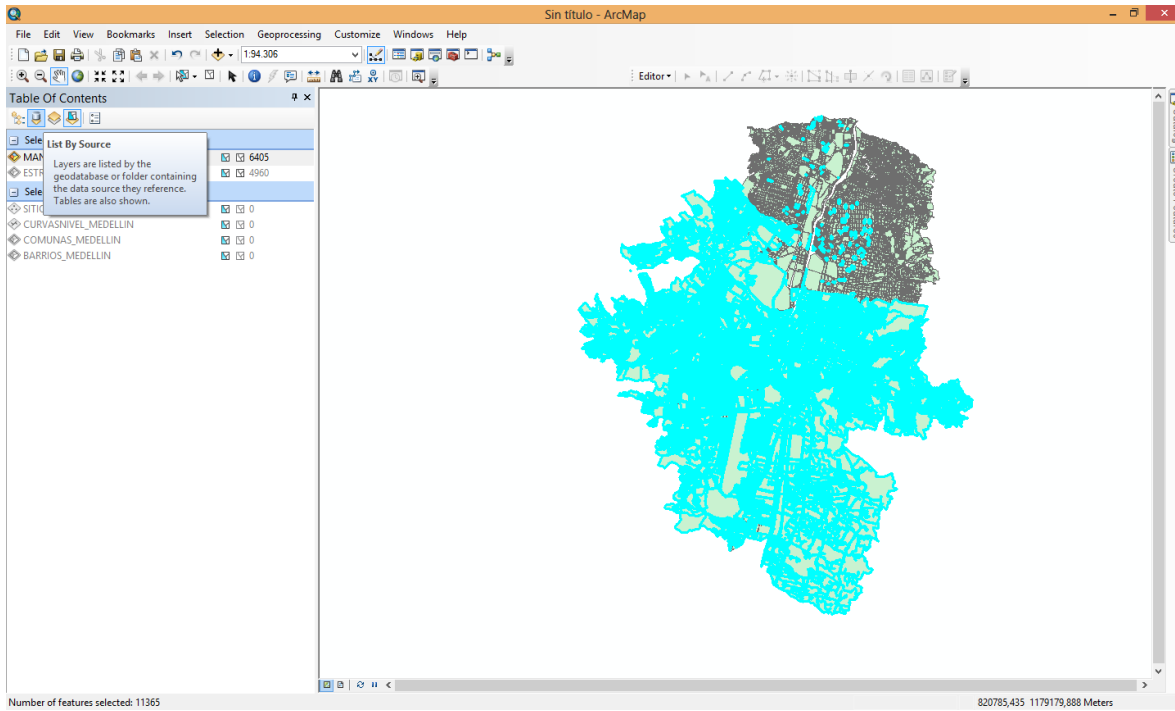


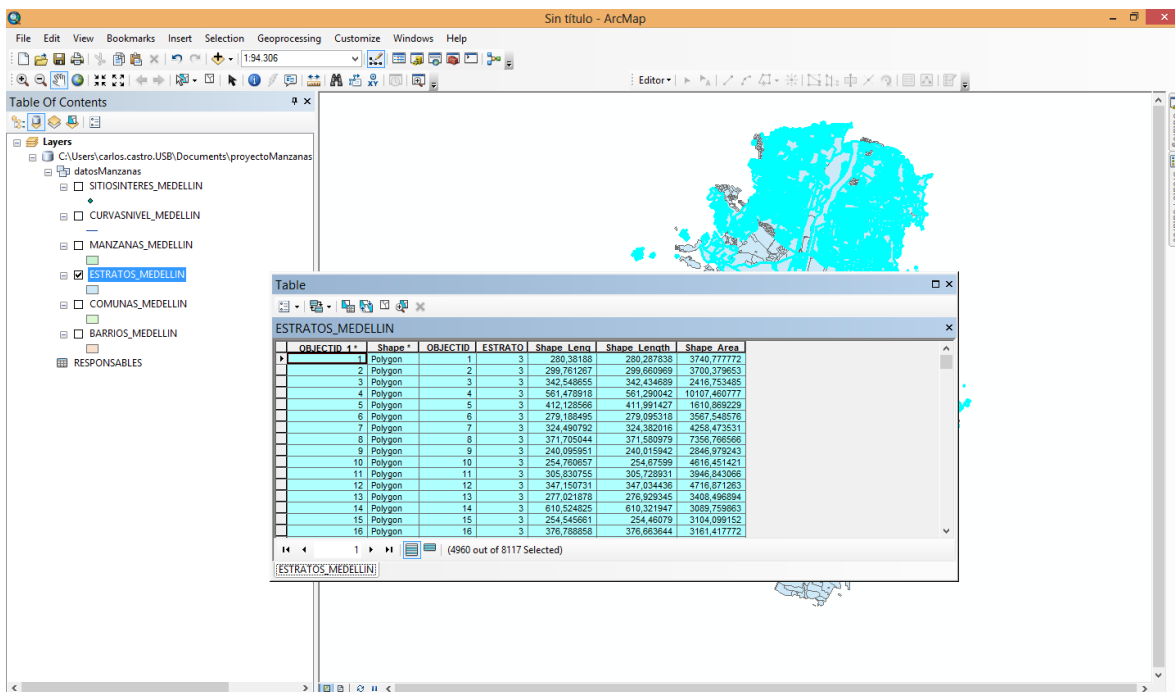
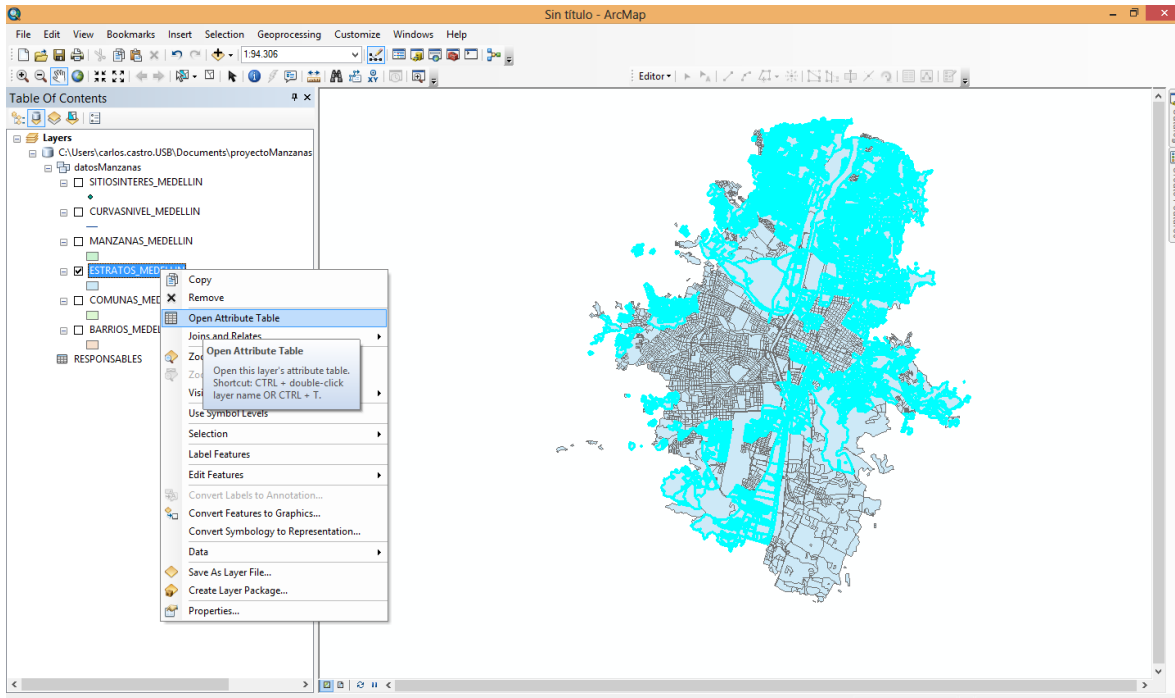


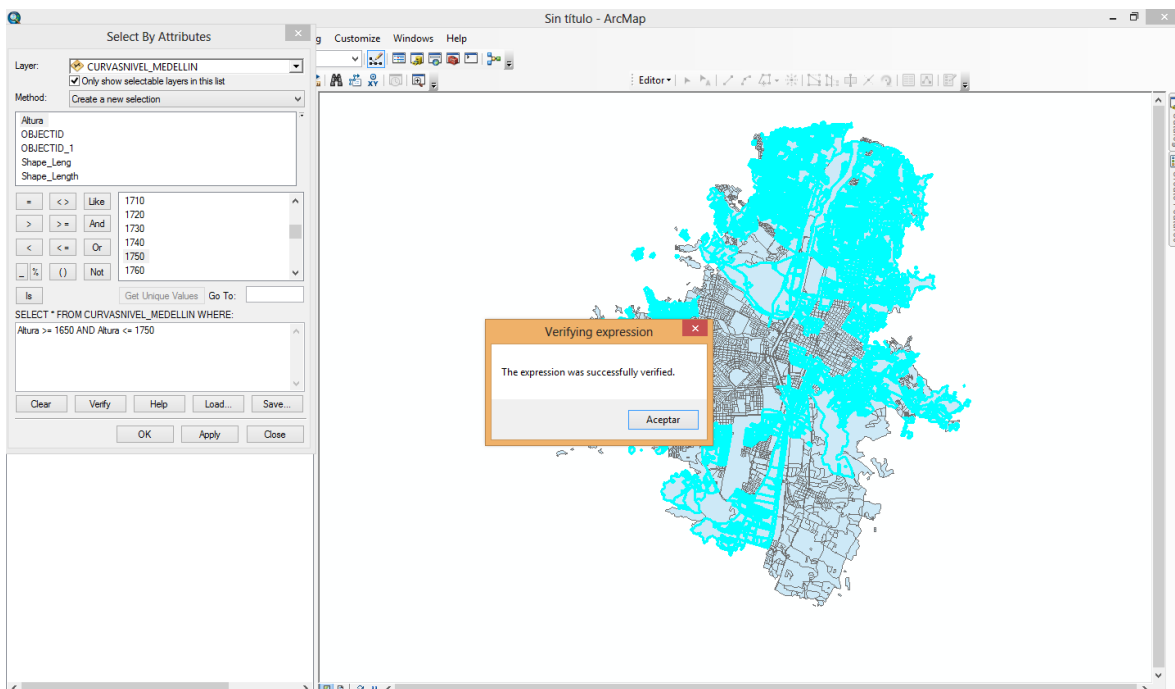
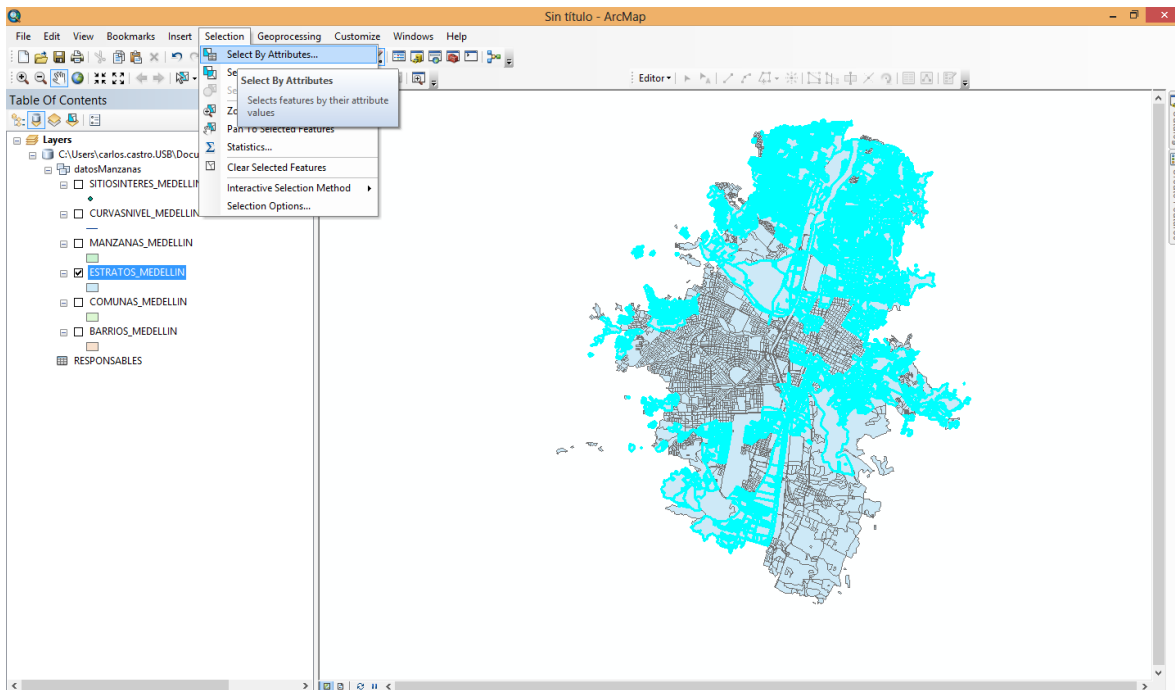


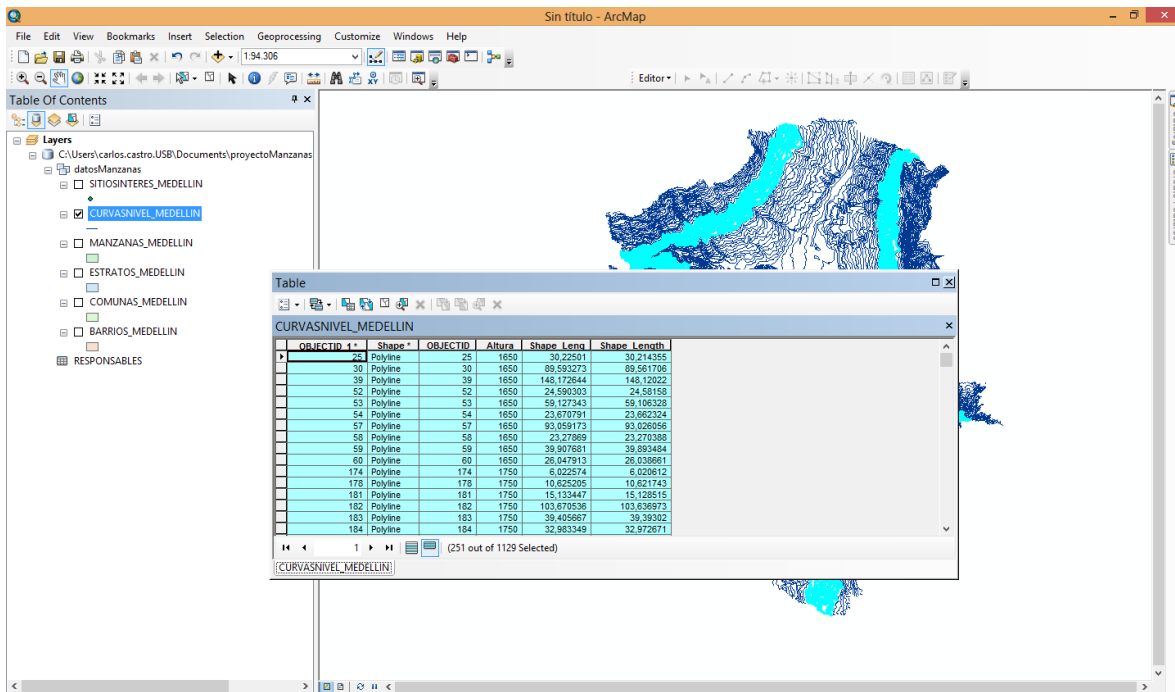
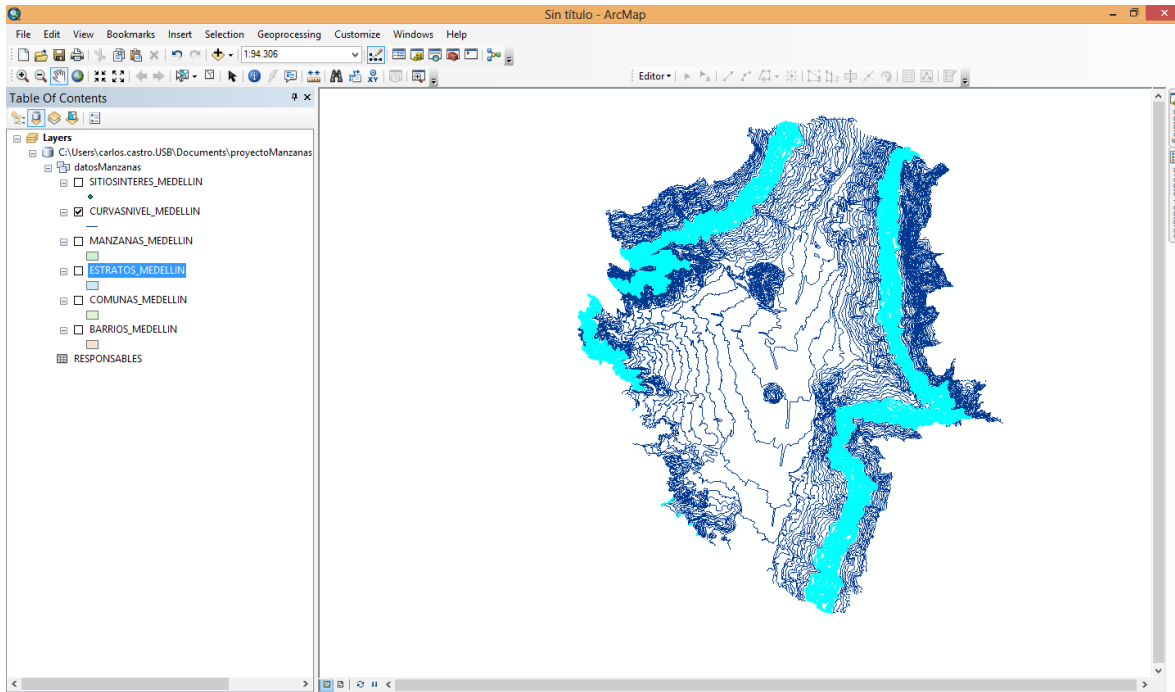


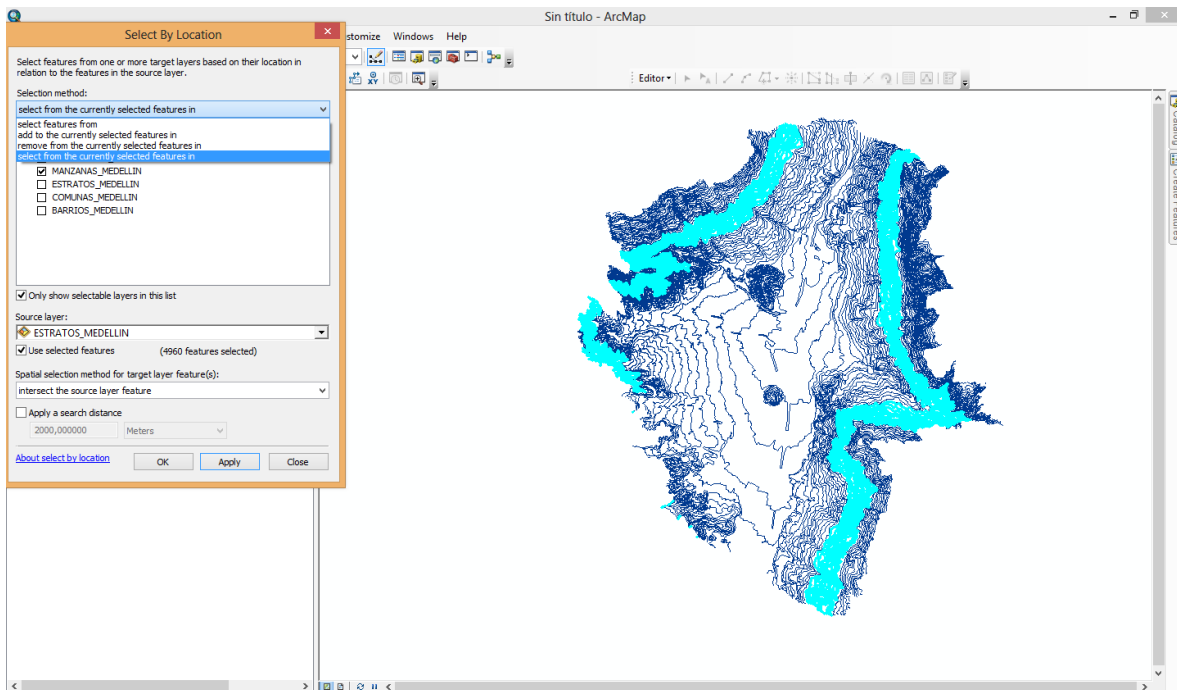
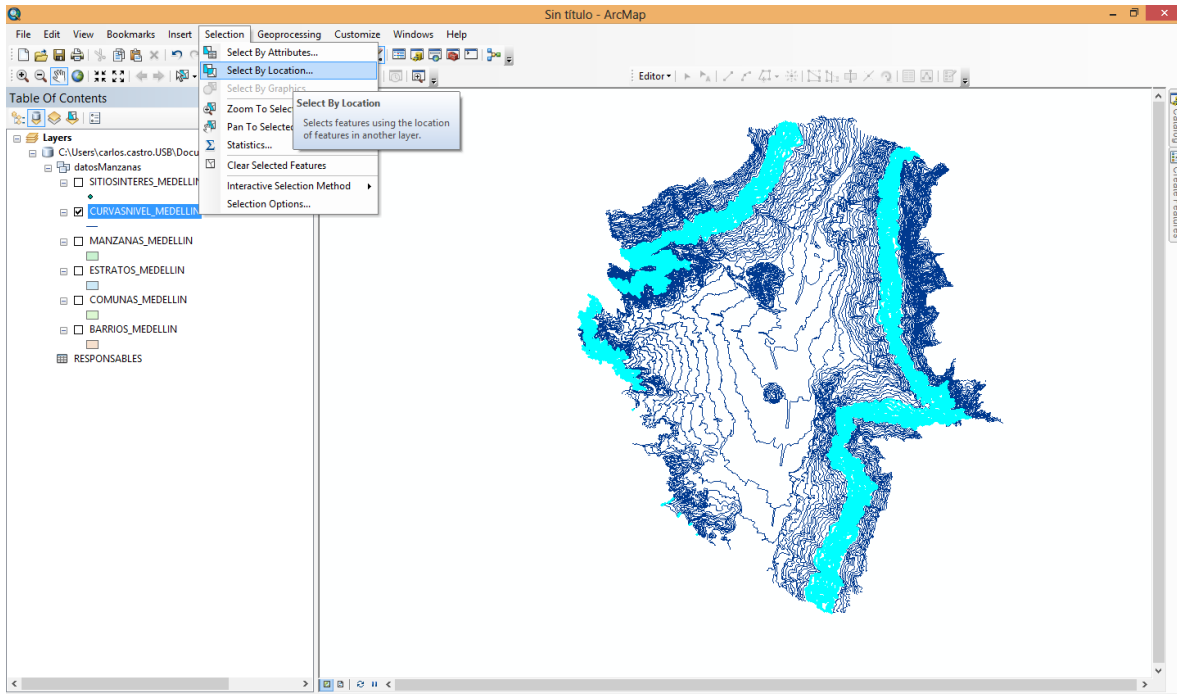


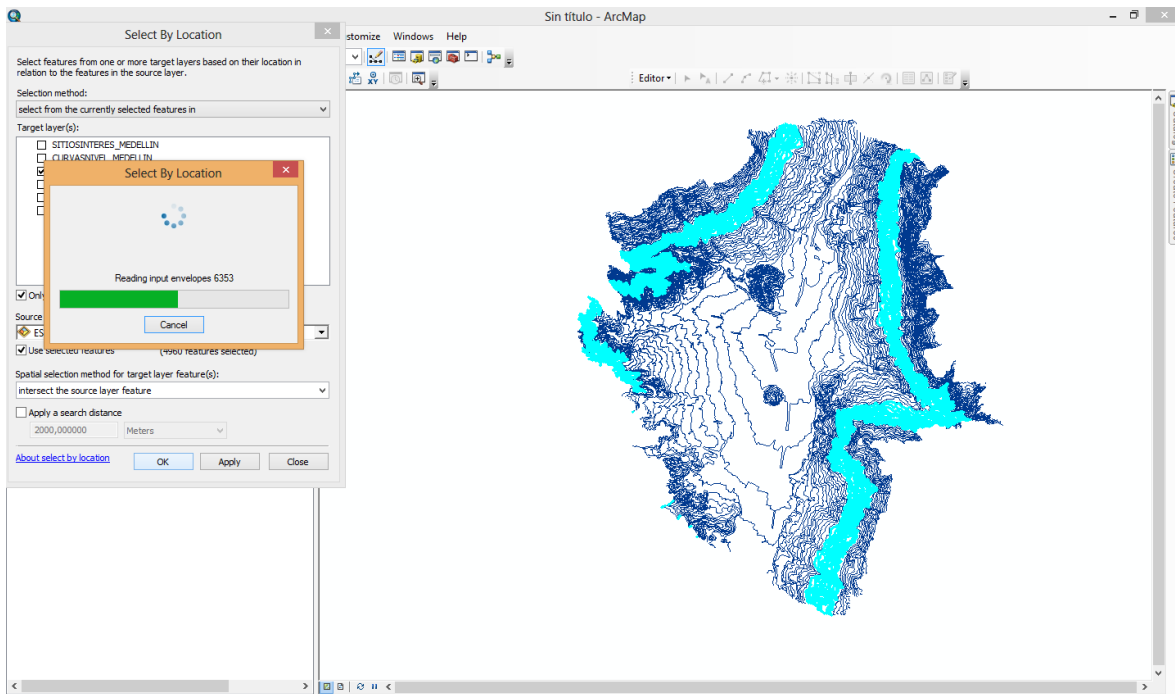
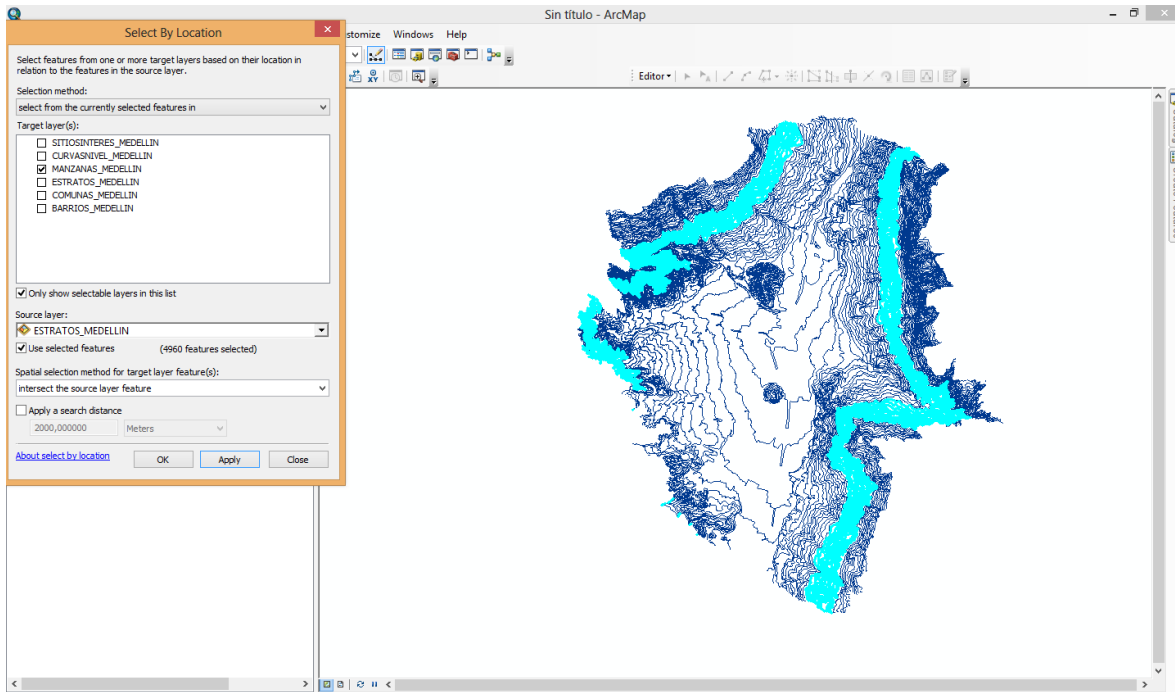


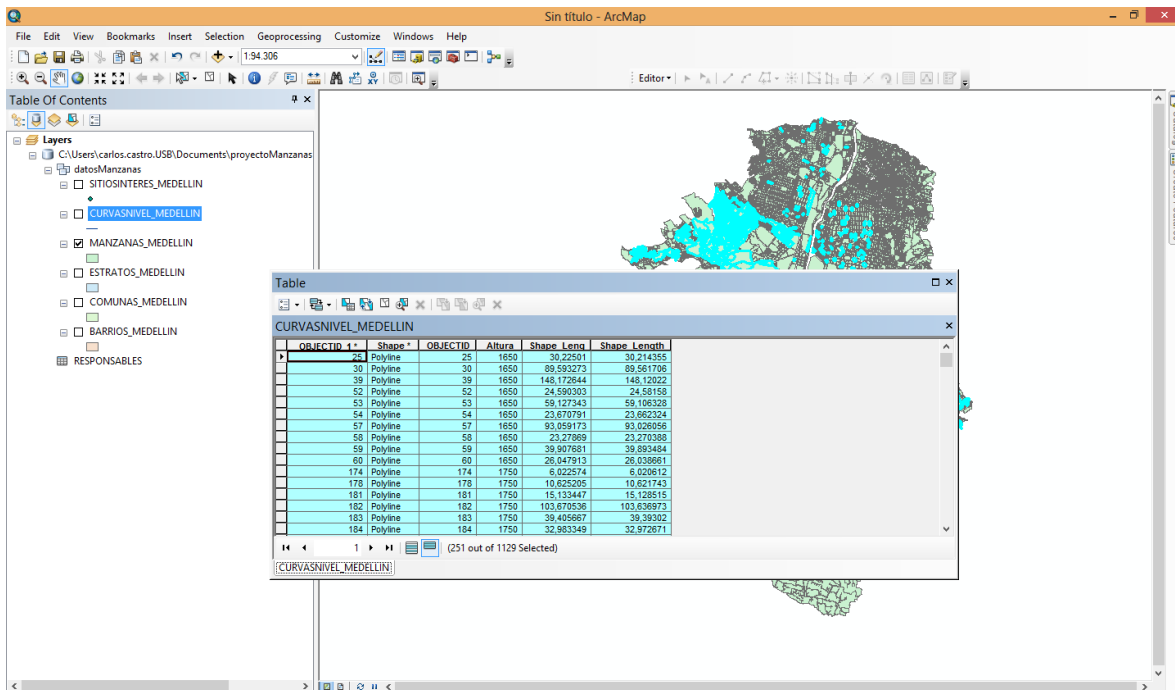
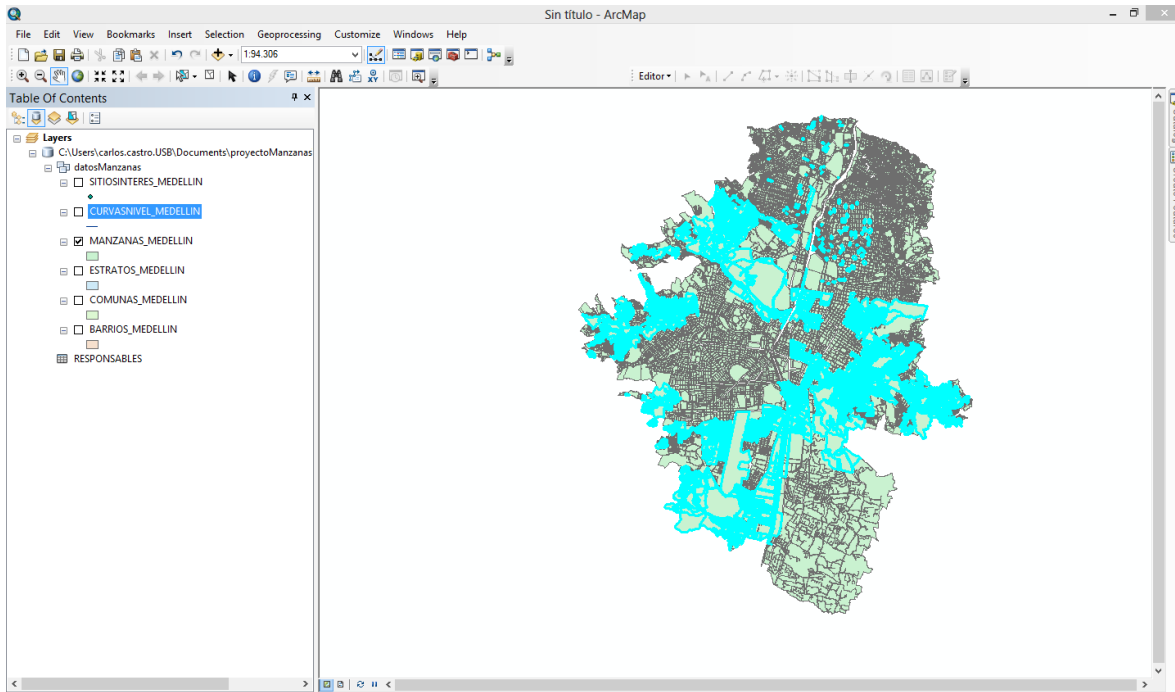




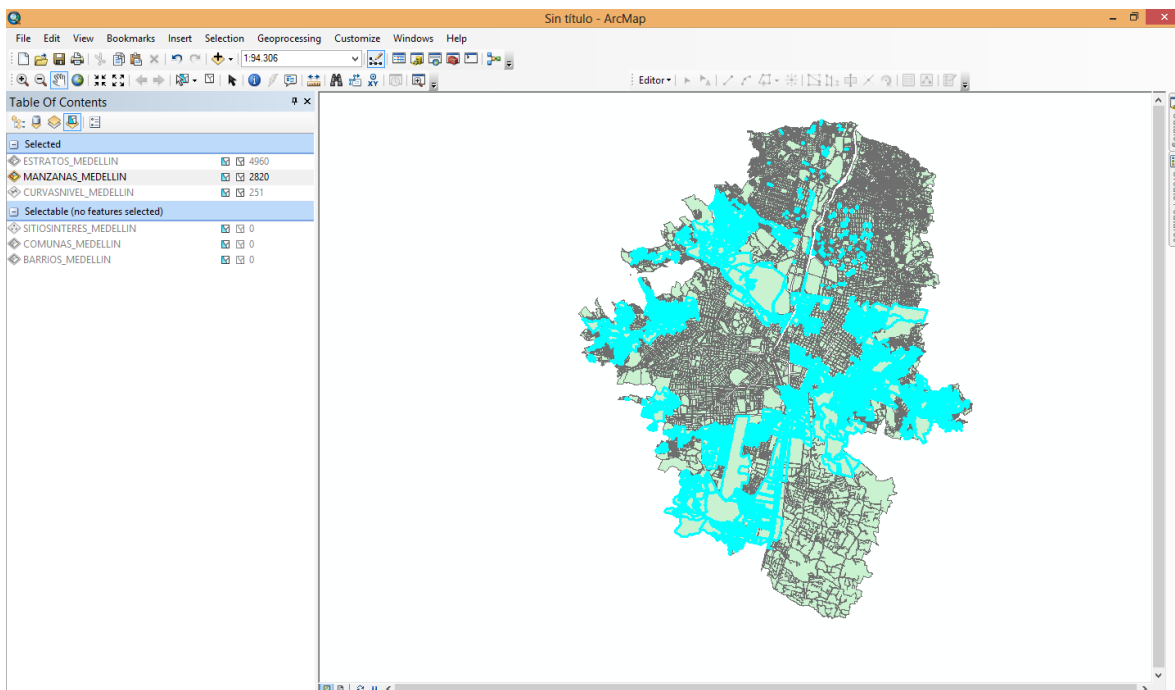
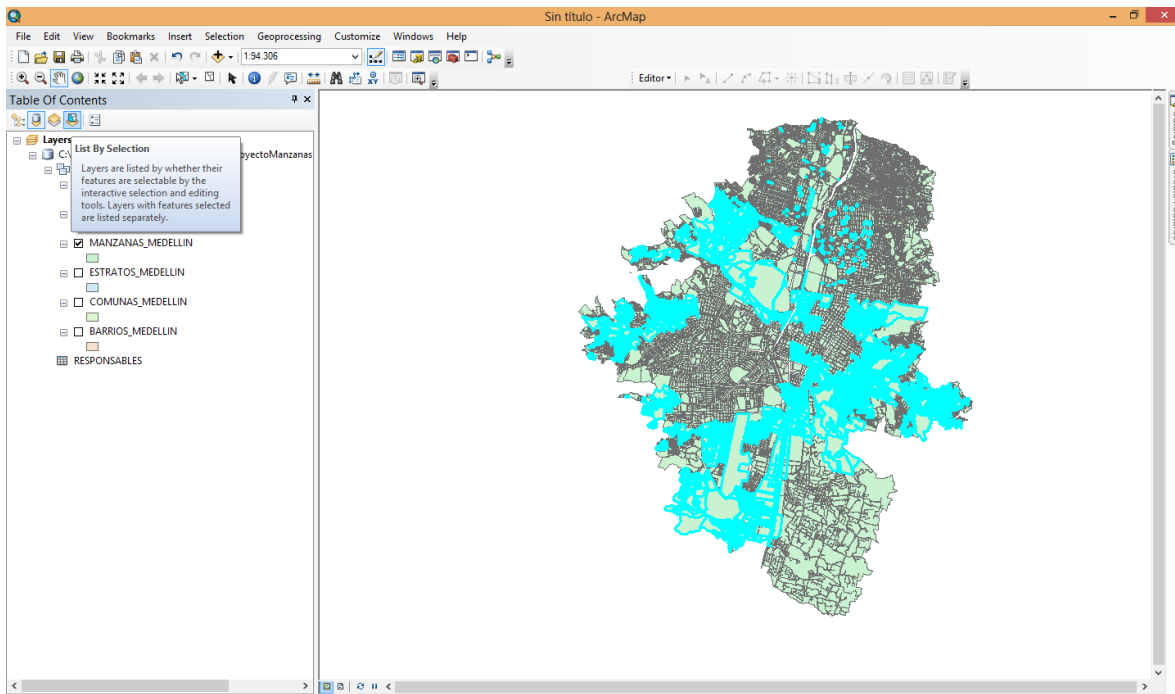


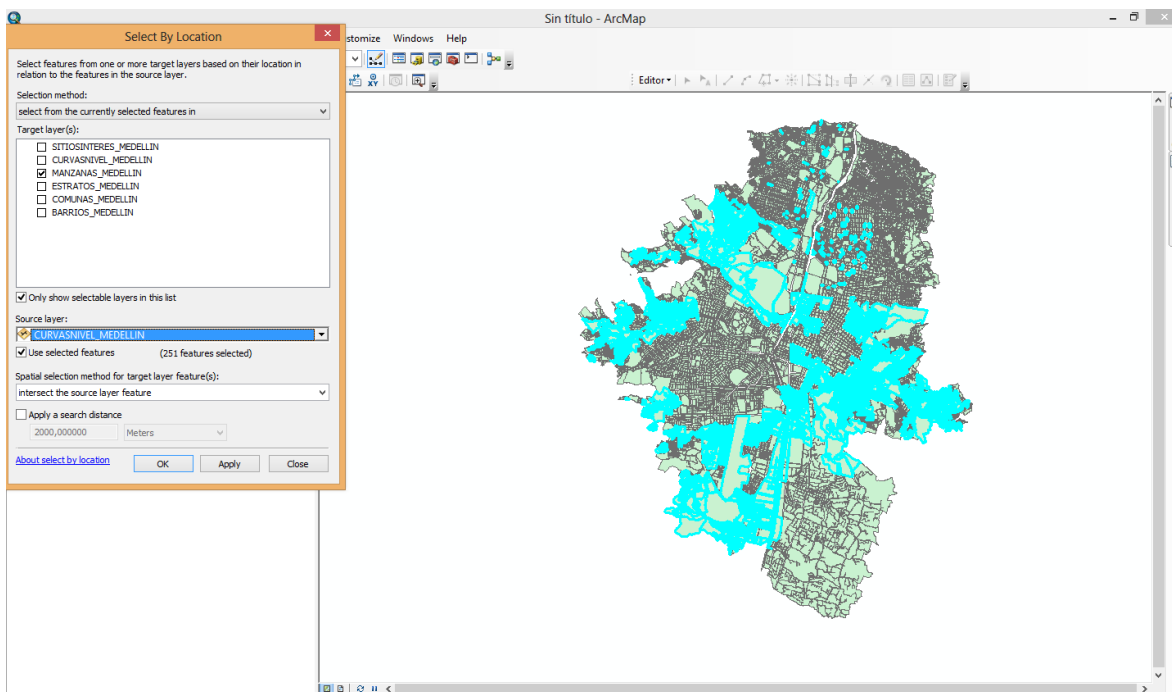
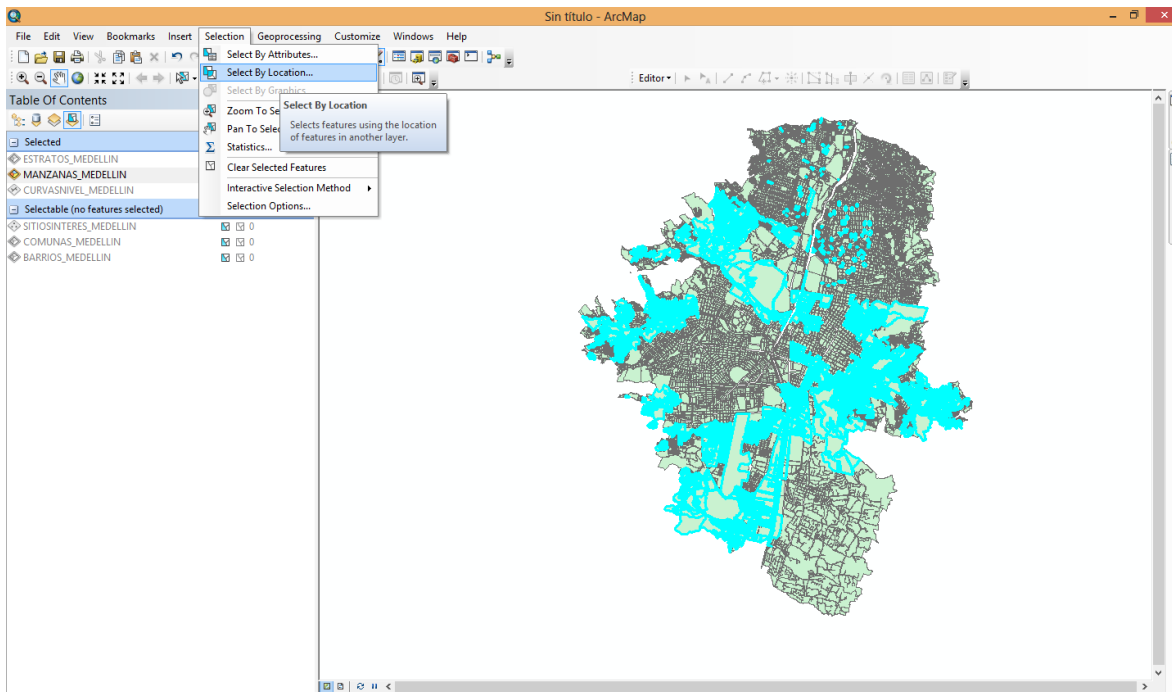


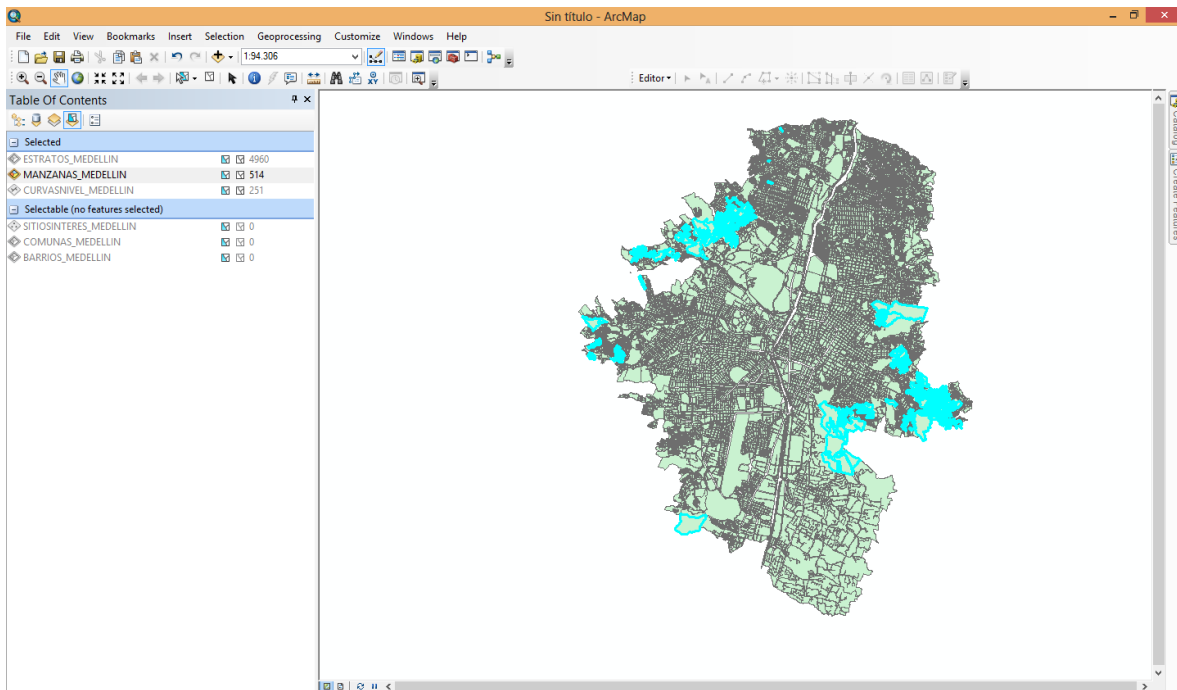
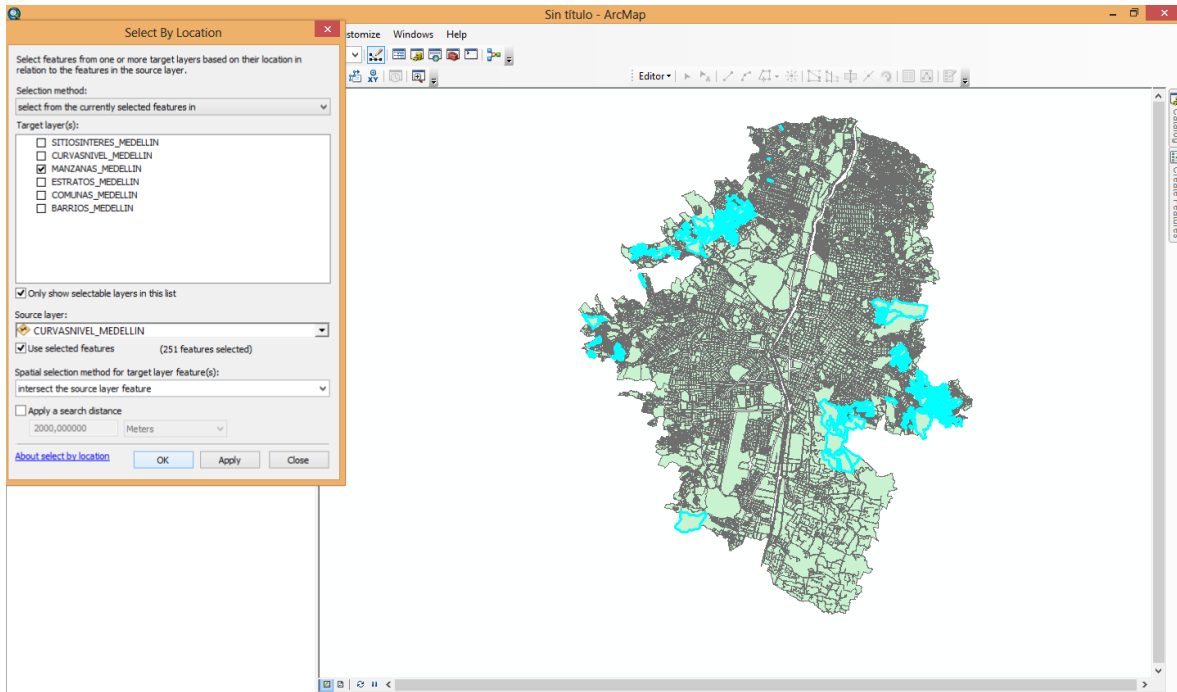


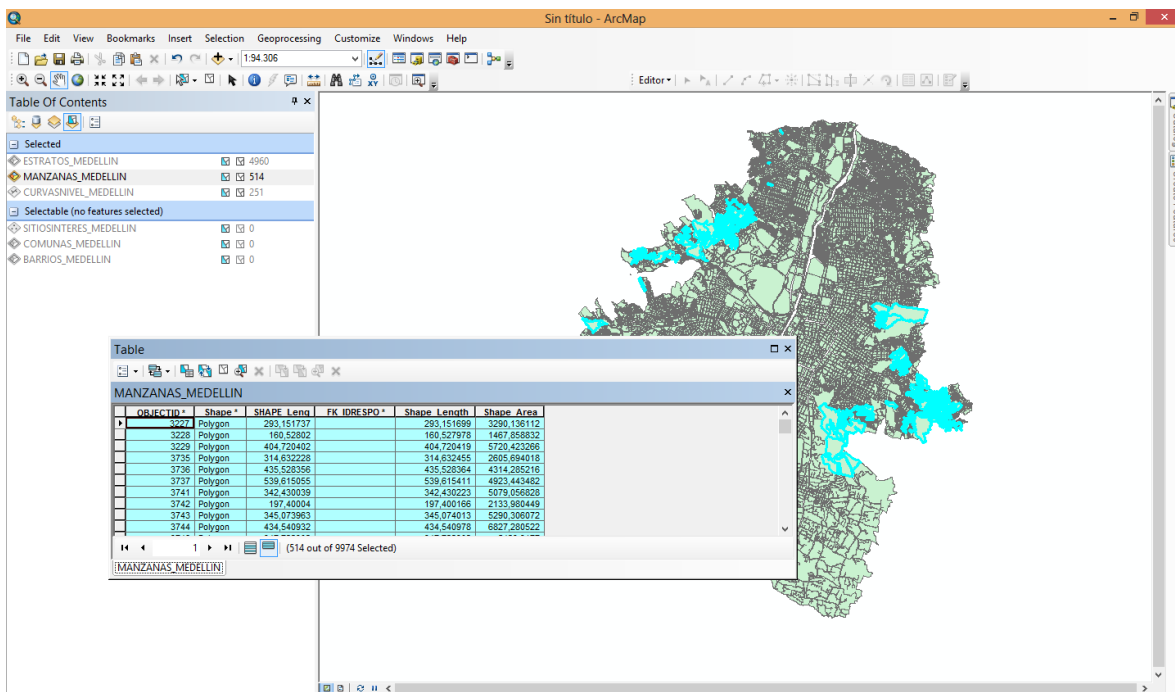
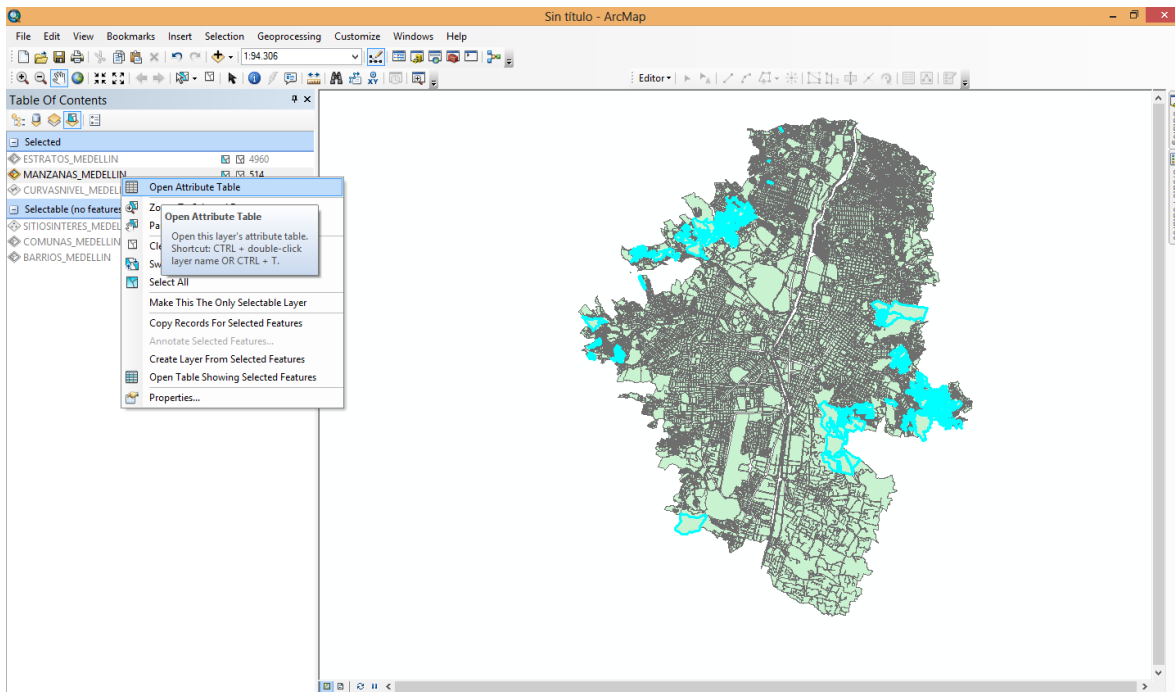






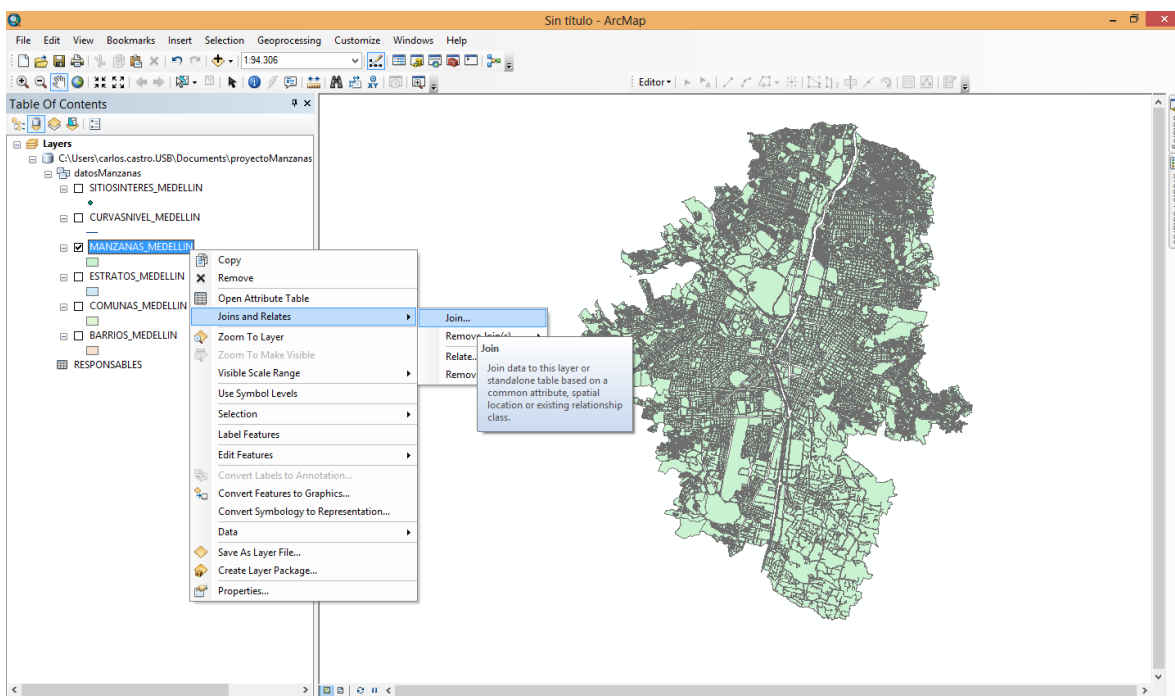
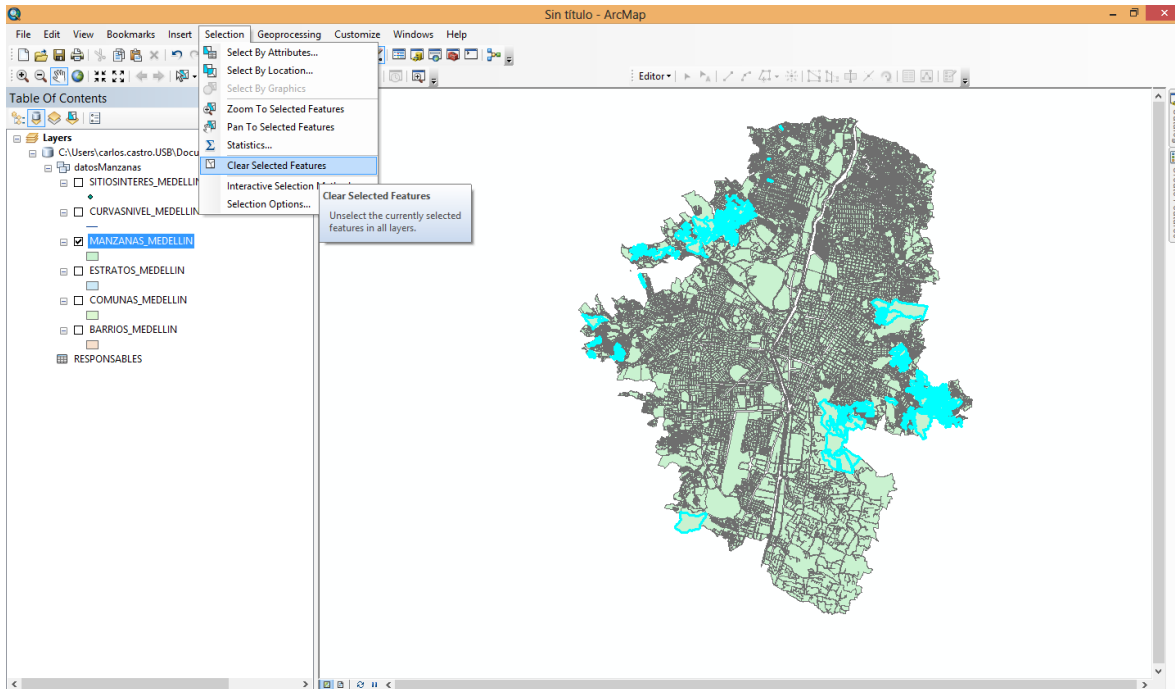


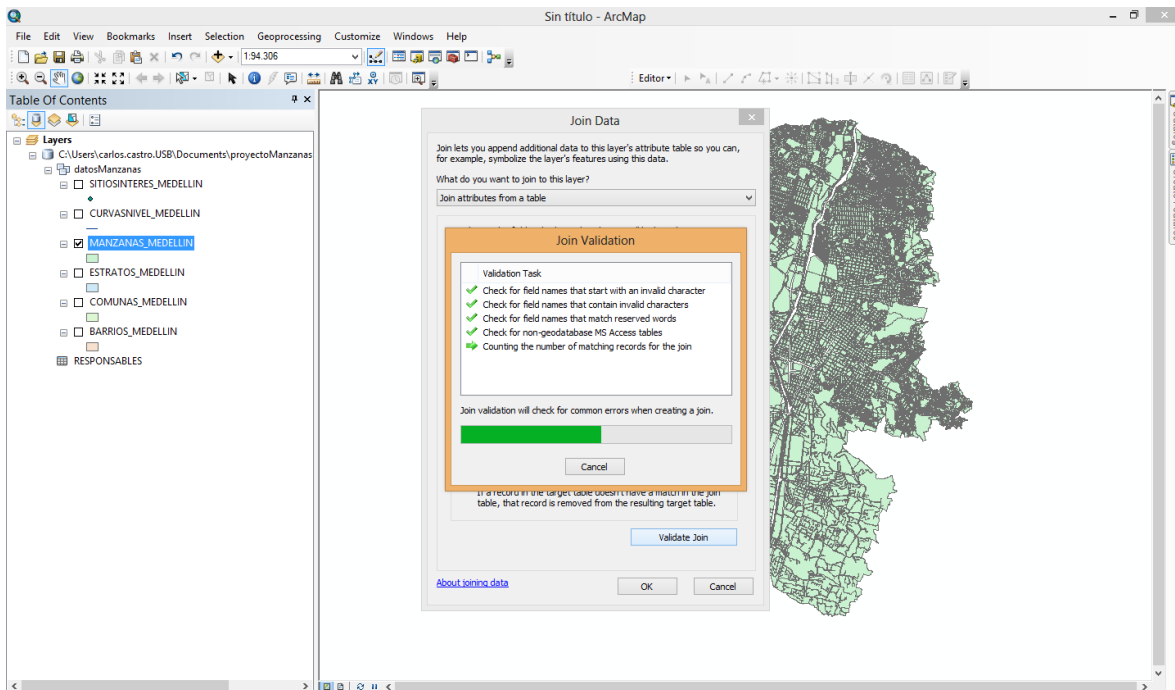
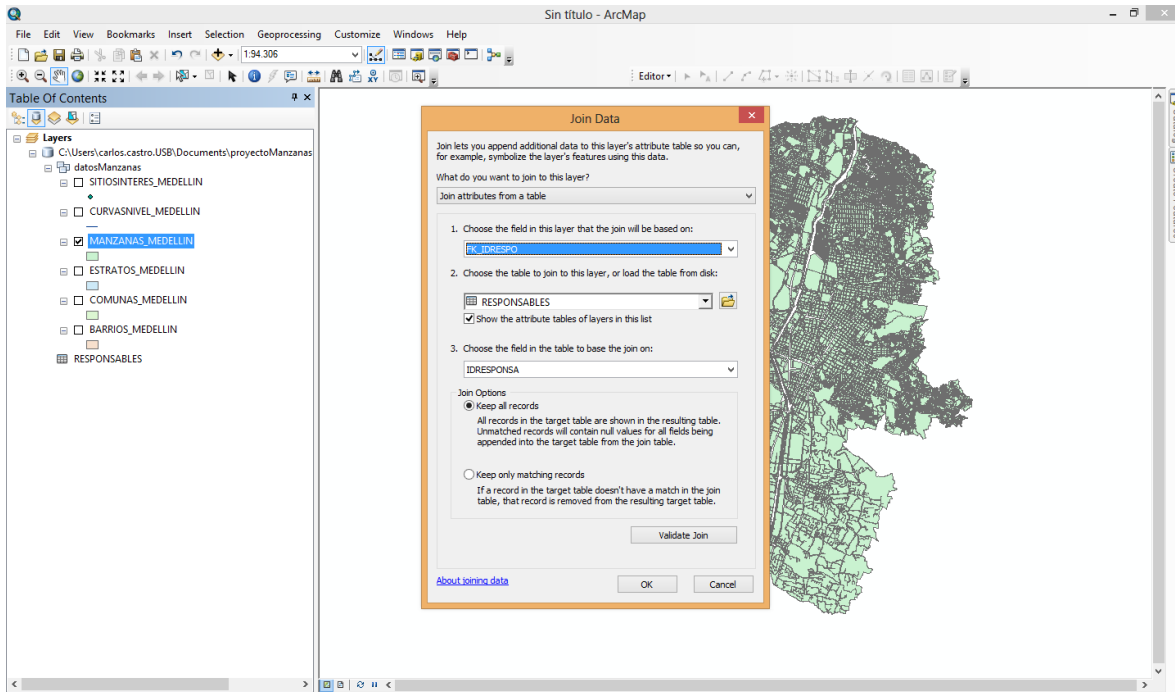


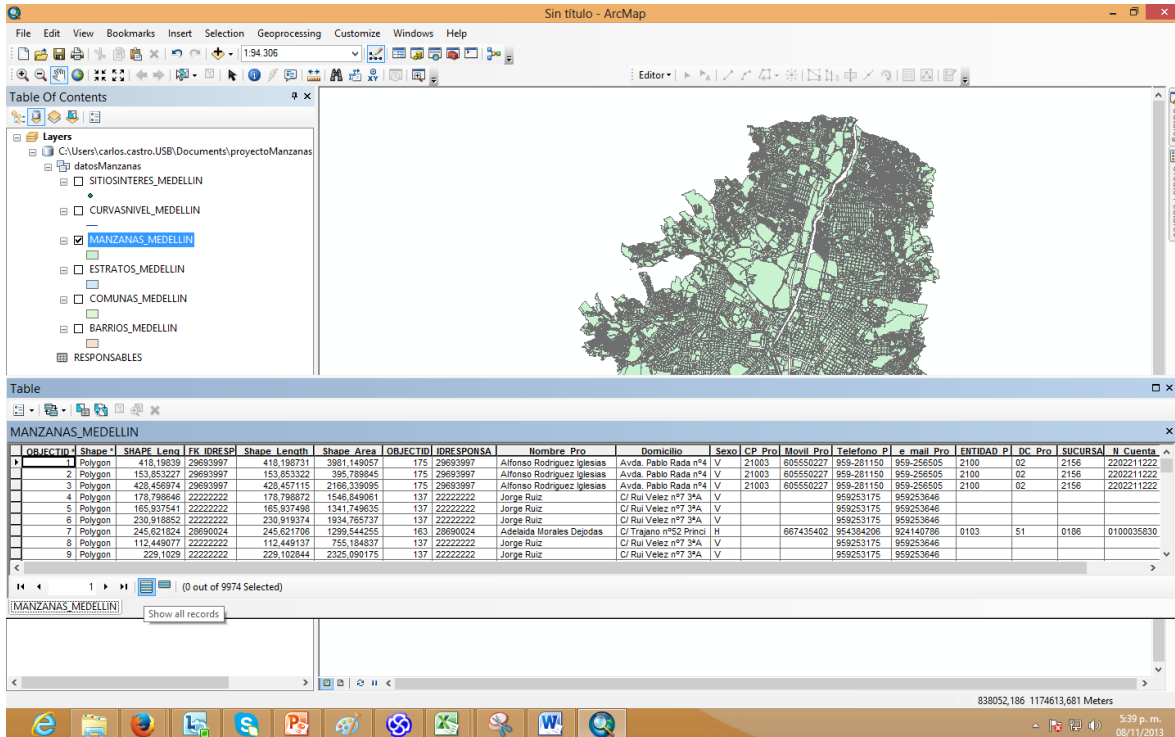
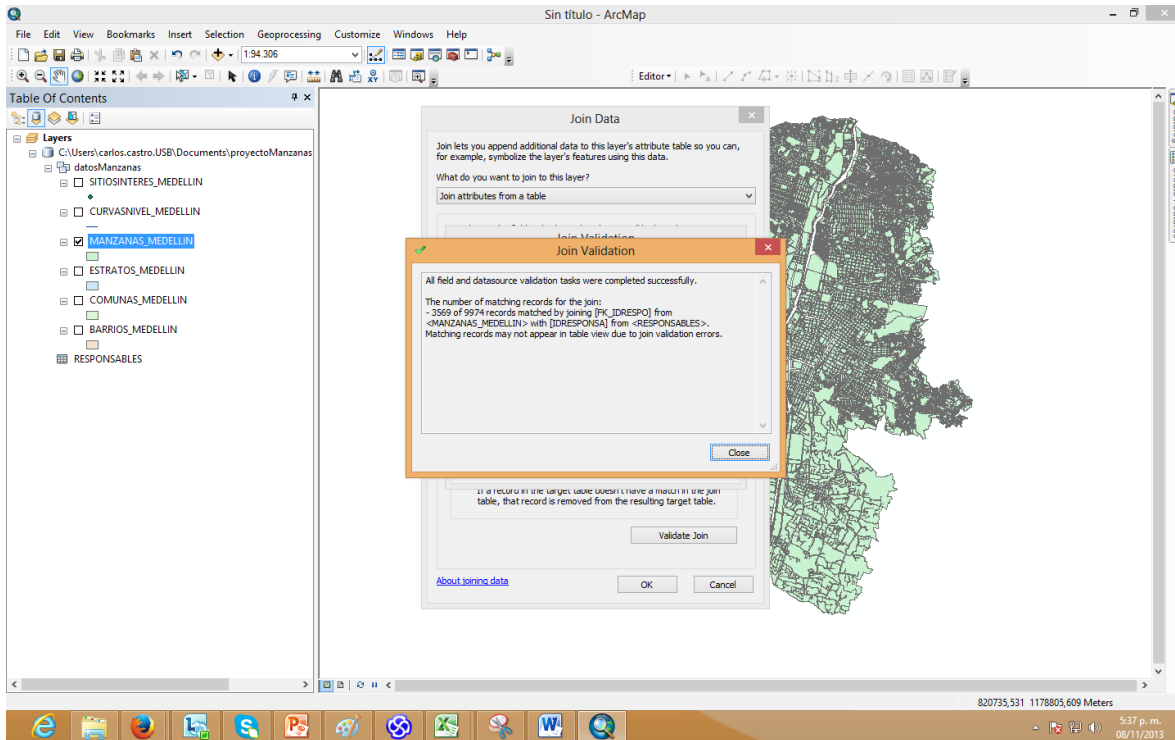


Mostrar las Manzanas que están a una altura entre 1500 y 1750 metros y de las cuales son responsables 'Adelaida Morales Dejodas', 'Alejandro Villanueva Hervas', 'Alfonso Rodriguez Iglesias' ó 'Ana Gómez'

Generar el join tabular entre responsables y MANZANAS\_MEDELLIN, para obtener en la tabla MANZANAS\_MEDELLIN el nombre del responsable y luego hacer una consulta por atributos







Table

MANZANAS\_MEDELLIN

OBJECTID	SHAPE	SHAPE_Length	SHAPE_Area	OBJECTID	IDRESPONSA	Nombre_Pro	Domicilio	Sexo	CP_Pro	Movil_Pro	Telefono_P	e_mail_Pro	ENTIDAD_P	DC_Pro	SUCURSA	II Cuenta		
1	Polygon	418.19839	29693997	418.19831	3951.149057	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-26505	2100	02	2156	2202211222
2	Polygon	153.853227	29693997	153.853322	395.789845	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-26505	2100	02	2156	2202211222
3	Polygon	428.456974	29693997	428.457115	2166.339095	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-26505	2100	02	2156	2202211222
4	Polygon	178.798072	22222222	178.798072	1548.849061	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
5	Polygon	165.937541	22222222	165.937496	1341.749635	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
6	Polygon	230.9189374	22222222	230.919374	1934.765737	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
7	Polygon	245.821624	28990024	245.821706	1299.544295	163	28990024	Adelaida Morales Dejedas	C/ Tragano n°52 Pncipi	H	867435402	954384296	924140798	0103	51	0186	01000035830	
8	Polygon	112.449077	22222222	112.449137	755.184857	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
9	Polygon	229.1029	22222222	229.102844	2325.090175	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					

820086,78 1187962,975 Meters

5:40 p. m. 08/11/2013

Select By Attributes

Layer: MANZANAS\_MEDELLIN

Method: Create a new selection

RESPONSABLES IDRESPONSA  
RESPONSABLES Movil\_Pro  
RESPONSABLES N\_Cuenta\_P  
RESPONSABLES Nombre\_Pro  
RESPONSABLES OBJECTID

SELECT \* FROM MANZANAS\_MEDELLIN\_RESPONSABLES WHERE:  
RESPONSABLES Nombre\_Pro = 'Adelaida Morales Dejedas' OR  
RESPONSABLES Nombre\_Pro = 'Alejandro Vilanova Hervas' OR  
RESPONSABLES Nombre\_Pro = 'Alfonso Rodriguez Iglesias' OR  
RESPONSABLES Nombre\_Pro = 'Ana Gómez'

Verifying expression

The expression was successfully verified.

Acceptar

Table

MANZANAS\_MEDELLIN

OBJECTID	SHAPE	SHAPE_Length	SHAPE_Area	OBJECTID	IDRESPONSA	Nombre_Pro	Domicilio	Sexo	CP_Pro	Movil_Pro	Telefono_P	e_mail_Pro	ENTIDAD_P	DC_Pro	SUCURSA	II Cuenta		
1	Polygon	418.19839	29693997	418.19831	3951.149057	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-26505	2100	02	2156	2202211222
2	Polygon	153.853227	29693997	153.853322	395.789845	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-26505	2100	02	2156	2202211222
3	Polygon	428.456974	29693997	428.457115	2166.339095	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-26505	2100	02	2156	2202211222
4	Polygon	178.798072	22222222	178.798072	1548.849061	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
5	Polygon	165.937541	22222222	165.937496	1341.749635	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
6	Polygon	230.9189374	22222222	230.919374	1934.765737	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
7	Polygon	245.821624	28990024	245.821706	1299.544295	163	28990024	Adelaida Morales Dejedas	C/ Tragano n°52 Pncipi	H	867435402	954384296	924140798	0103	51	0186	01000035830	
8	Polygon	112.449077	22222222	112.449137	755.184857	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					
9	Polygon	229.1029	22222222	229.102844	2325.090175	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V		959253175	959253646					

820061,829 1189800,419 Meters

5:41 p. m. 08/11/2013



Sin título - ArcMap

Select By Attributes

Layer: MANZANAS\_MEDELLIN

Method: Create a new selection

RESPONSABLES IDRESPONSA  
RESPONSABLES Movil\_Pro  
RESPONSABLES N\_Cuenta\_P  
RESPONSABLES Nombre\_Pro  
RESPONSABLES OBJECTID

Like  
> And  
< Or  
Not

Get Unique Values Go To:

SELECT \* FROM MANZANAS\_MEDELLIN\_RESPONSABLES WHERE:  
RESPONSABLES Nombre\_Pro = 'Adelaida Morales Dejotas' OR  
RESPONSABLES Nombre\_Pro = 'Alejandro Villanueva Henvas' OR  
RESPONSABLES Nombre\_Pro = 'Alfonso Rodriguez Iglesias' OR  
RESPONSABLES Nombre\_Pro = 'Ana Gómez'

Clear Verify Help Load... Save...

OK Apply Close

OBJECTID	Shape	SHAPE	Length	IR	UR	SP	Shape	Length	Shape	Area	OBJECTID	IDRESPONSA	Nombre_Pro	Domicilio	Sexo	CP_Pro	Movil_Pro	Telefono_P	e_mail_Pro	ENTIDAD_P	DC_Pro	SUCURSA	N_Cuenta
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2	Polygon	153.853227	29693997	153.853227	395.789845	175	29693997	395.789845	175	29693997	Alfonso Rodriguez Iglesias	Adelaida Morales Dejotas	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222	
3	Polygon	428.456974	29693997	428.456974	2166.339095	175	29693997	2166.339095	175	29693997	Alfonso Rodriguez Iglesias	Adelaida Morales Dejotas	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222	
4	Polygon	178.798046	22222222	178.798046	1548.849061	137	22222222	1548.849061	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
5	Polygon	165.937541	22222222	165.937541	1341.749635	137	22222222	1341.749635	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
6	Polygon	230.918552	22222222	230.918552	1934.765737	137	22222222	1934.765737	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
7	Polygon	245.621624	28990024	245.621624	1299.544295	163	28990024	1299.544295	163	28990024	Adelaida Morales Dejotas	Adelaida Morales Dejotas	C/ Tragono n°52 Princi	H		867435402	954384296	924140798	0103	51	0186	0100035830	
8	Polygon	112.449137	22222222	112.449137	755.184857	137	22222222	755.184857	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
9	Polygon	229.1029	22222222	229.1029	2325.090175	137	22222222	2325.090175	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					

828345,877 1174364,161 Meters

5:41 p. m. 08/11/2013

Sin título - ArcMap

Select By Attributes

Guardar como

Guardar en: proyectoManzanas

Nombre: CONSULTA2\_ADELAIDA\_ALEJANDRO\_ALFONSO\_ANA

Tipo: Expresiones

Guarda Cancela

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2	Polygon	153.853227	29693997	153.853227	395.789845	175	29693997	395.789845	175	29693997	Alfonso Rodriguez Iglesias	Adelaida Morales Dejotas	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222	
3	Polygon	428.456974	29693997	428.456974	2166.339095	175	29693997	2166.339095	175	29693997	Alfonso Rodriguez Iglesias	Adelaida Morales Dejotas	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222	
4	Polygon	178.798046	22222222	178.798046	1548.849061	137	22222222	1548.849061	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
5	Polygon	165.937541	22222222	165.937541	1341.749635	137	22222222	1341.749635	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
6	Polygon	230.918552	22222222	230.918552	1934.765737	137	22222222	1934.765737	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
7	Polygon	245.621624	28990024	245.621624	1299.544295	163	28990024	1299.544295	163	28990024	Adelaida Morales Dejotas	Adelaida Morales Dejotas	C/ Tragono n°52 Princi	H		867435402	954384296	924140798	0103	51	0186	0100035830	
8	Polygon	112.449137	22222222	112.449137	755.184857	137	22222222	755.184857	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					
9	Polygon	229.1029	22222222	229.1029	2325.090175	137	22222222	2325.090175	137	22222222	Jorge Ruiz	Adelaida Morales Dejotas	C/ Rui Velez n°7 3ºA.	V			959253175	959253646					

824603,084 1185343,02 Meters

5:43 p. m. 08/11/2013

Sin título - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

Editor

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- Layers
  - C:\Users\carlos.castro.USB\Documents\proyectoManzanas
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      - SITIOSINTERES\_MEDELLIN
      - CURVASNIVEL\_MEDELLIN
      - MANZANAS\_MEDELLIN**
      - ESTRATOS\_MEDELLIN
      - COMUNAS\_MEDELLIN
      - BARRIOS\_MEDELLIN
      - RESPONSABLES

Table

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2	Polygon	153.853227	29693997	153.853322	395.789845	175	29693997	395.789845	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222
3	Polygon	428.456974	29693997	428.457115	2168.330955	175	29693997	2168.330955	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222
4	Polygon	178.798046	22222222	178.798072	1548.849081	137	22222222	1548.849081	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V			959253175	959253646				
5	Polygon	165.937941	22222222	165.937496	1341.749635	137	22222222	1341.749635	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V			959253175	959253646				
6	Polygon	230.918562	22222222	230.919374	1934.765737	137	22222222	1934.765737	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V			959253175	959253646				
7	Polygon	245.621624	28990024	245.621706	1299.544255	163	28990024	1299.544255	163	28990024	Adelaida Morales Dejodas	C/ Trajano n°52 Princi	H		667435402	954384206	924140796	0103	51	0186	0100035830
8	Polygon	112.449137	22222222	112.449137	755.194837	137	22222222	755.194837	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V			959253175	959253646				
9	Polygon	229.1029	22222222	229.102844	2325.090175	137	22222222	2325.090175	137	22222222	Jorge Ruiz	C/ Rui Velez n°7 3ªA.	V			959253175	959253646				

Number of features selected: 99

5:43 p. m. 02/11/2013

Sin título - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

Editor

Table Of Contents

- Layers
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      - CURVASNIVEL\_MEDELLIN
      - MANZANAS\_MEDELLIN**
      - ESTRATOS\_MEDELLIN
      - COMUNAS\_MEDELLIN
      - BARRIOS\_MEDELLIN
      - RESPONSABLES

Table

MANZANAS\_MEDELLIN

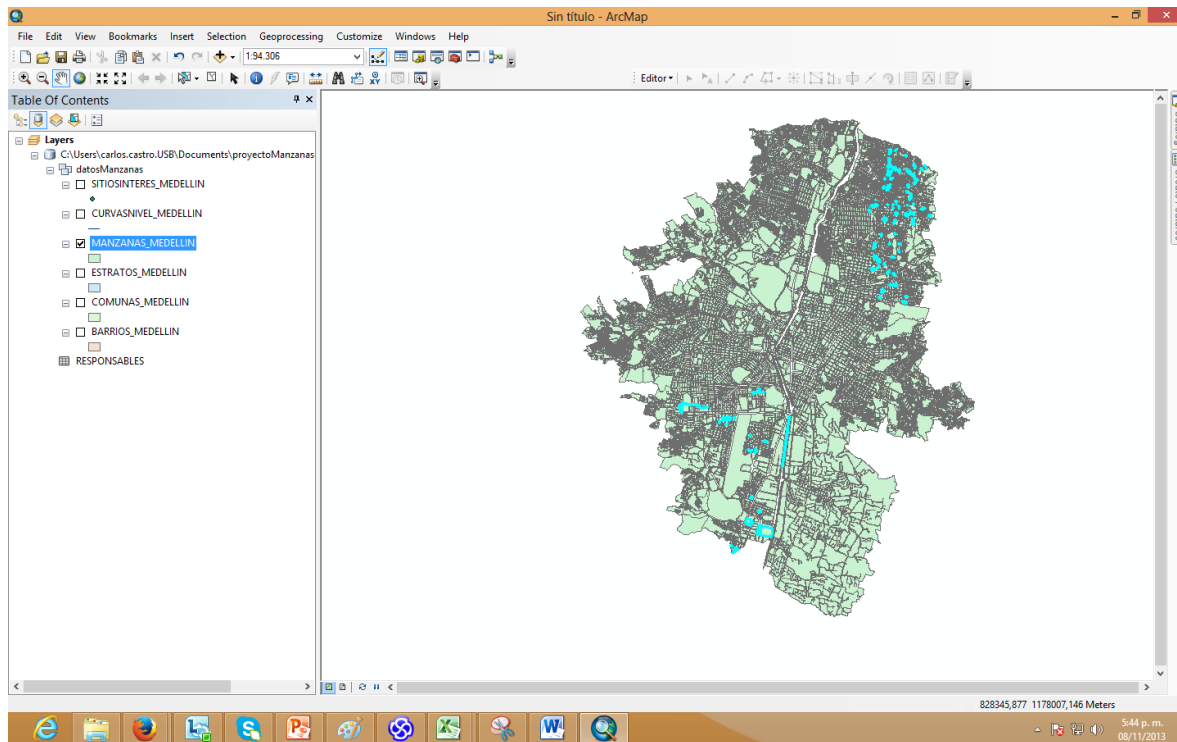
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2	Polygon	153.853227	29693997	153.853322	395.789845	175	29693997	395.789845	175	29693997	Alfonso Rodriguez Iglesias	Avda. Pablo Rada n°4	V	21003	605550227	959-281150	959-256505	2100	02	2156	2202211222
7	Polygon	245.621624	28990024	245.621706	1299.544255	163	28990024	1299.544255	163	28990024	Adelaida Morales Dejodas	C/ Trajano n°52 Princi	H		667435402	954384206	924140796	0103	51	0186	0100035830
11	Polygon	250.512535	00000002	250.512806	3632.802015	4	00000002	3632.802015	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
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13	Polygon	297.049072	00000002	297.049311	1650.950249	4	00000002	1650.950249	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
14	Polygon	417.999801	00000002	418.000418	2123.77448	4	00000002	2123.77448	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
15	Polygon	46.160365	00000002	46.160417	124.907654	4	00000002	124.907654	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
48	Polygon	592.947831	00000002	592.947798	5081.457343	4	00000002	5081.457343	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
49	Polygon	133.487503	00000002	133.487474	836.523733	4	00000002	836.523733	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
50	Polygon	150.341058	00000002	150.341156	1085.268881	4	00000002	1085.268881	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
51	Polygon	1010.975657	00000002	1010.976297	8119.271024	4	00000002	8119.271024	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
52	Polygon	117.66543	00000002	117.665546	680.041318	4	00000002	680.041318	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
53	Polygon	266.947201	00000002	266.947339	1514.713431	4	00000002	1514.713431	4	00000002	Ana Gómez	c/ Enrique Granado n°H	H								
62	Polygon	378.795178	28990024	378.794779	3259.125409	163	28990024	3259.125409	163	28990024	Adelaida Morales Dejodas	C/ Trajano n°52 Princi	H		667435402	954384206	924140796	0103	51	0186	0100035830
98	Polygon	281.668475	28990024	281.668975	4378.210953	163	28990024	4378.210953	163	28990024	Adelaida Morales Dejodas	C/ Trajano n°52 Princi	H		667435402	954384206	924140796	0103	51	0186	0100035830
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Number of features selected: 99

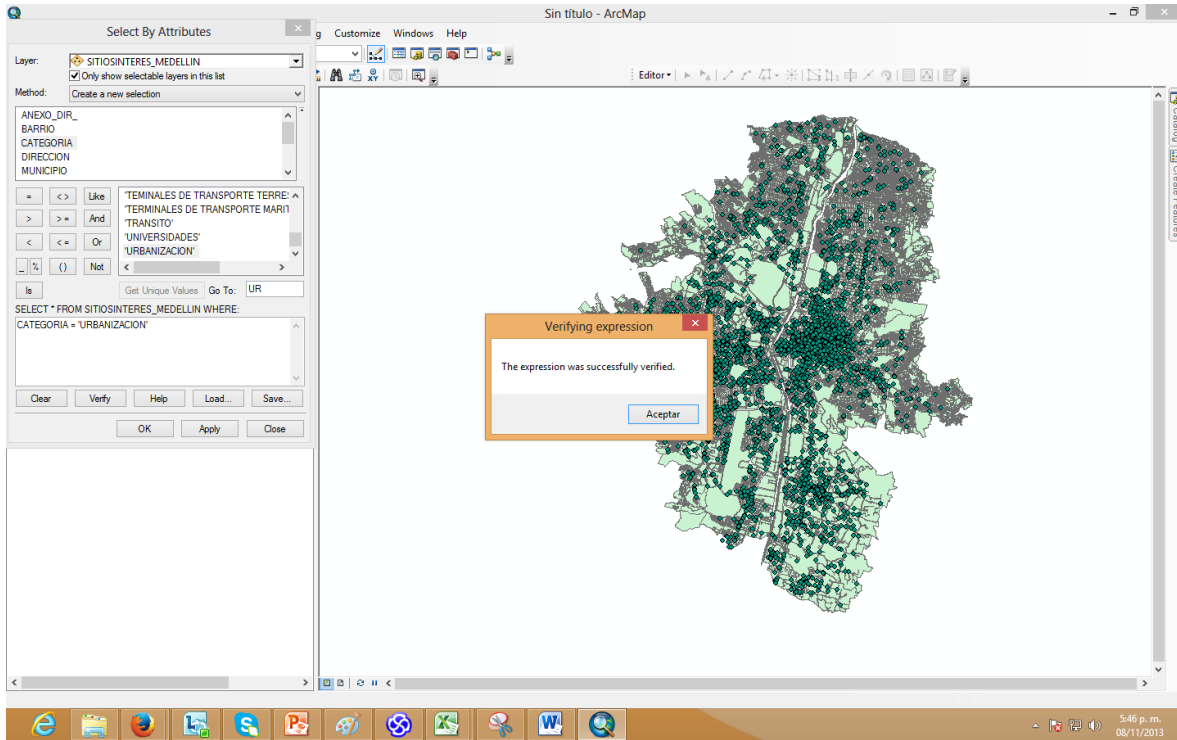
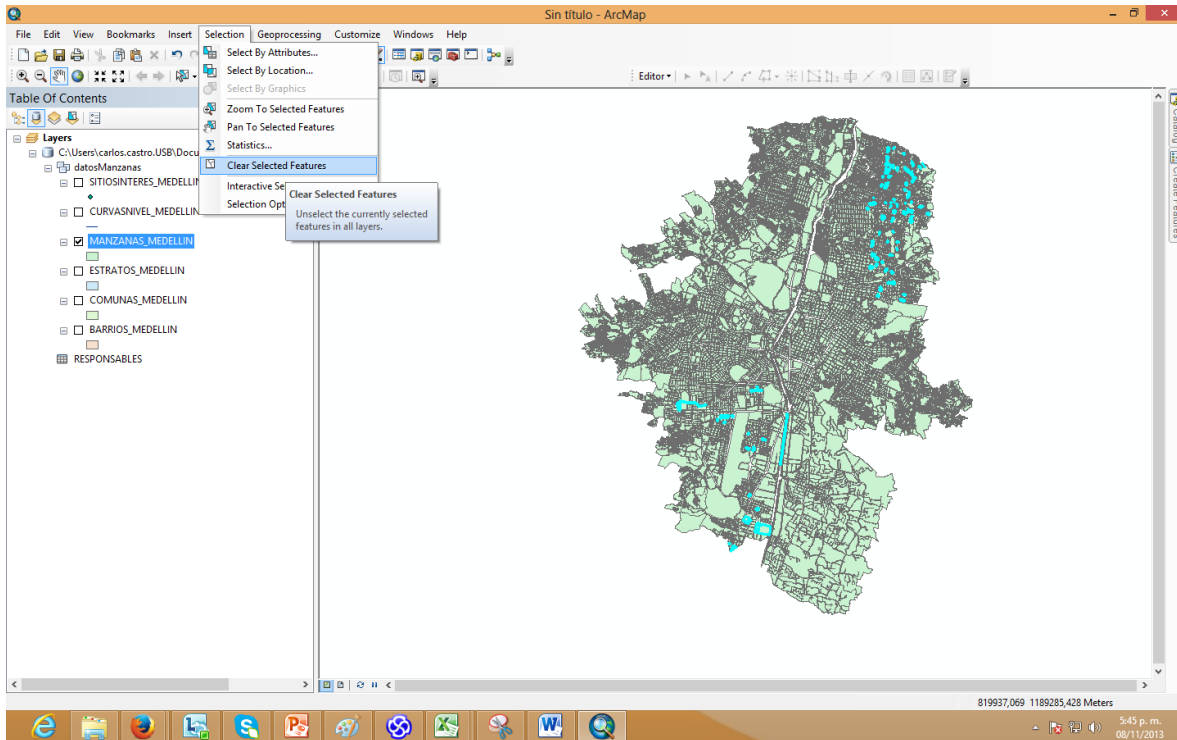
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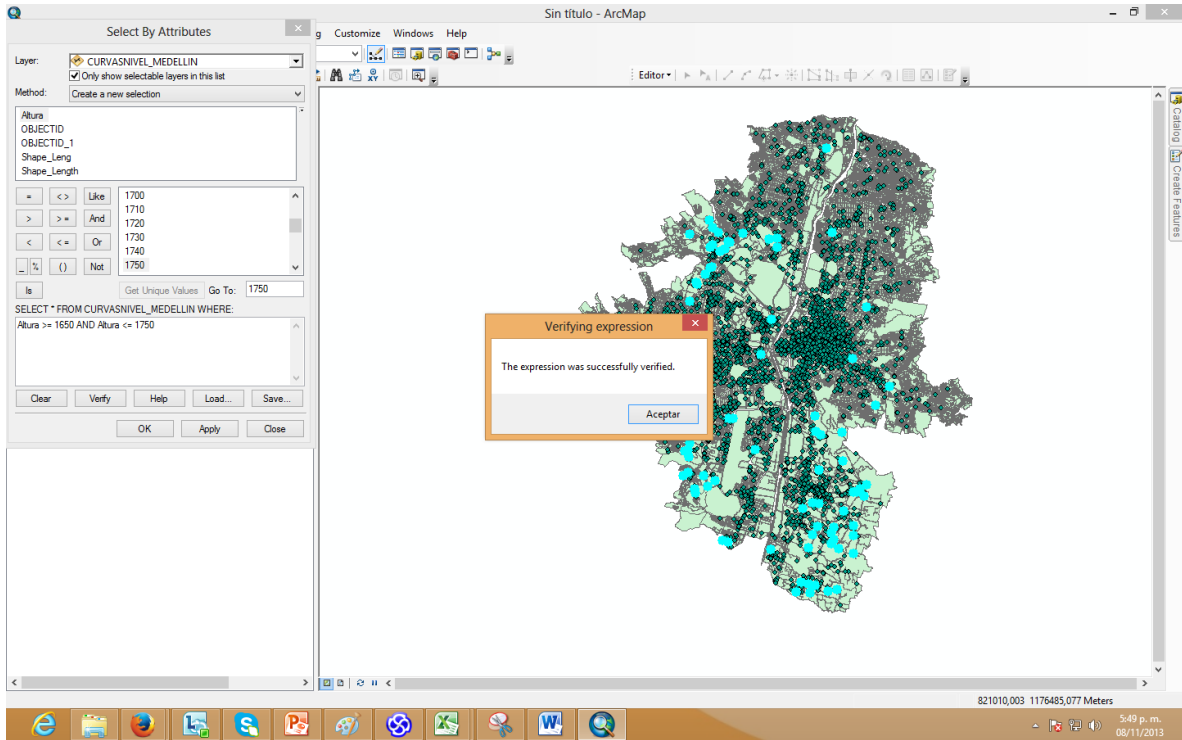
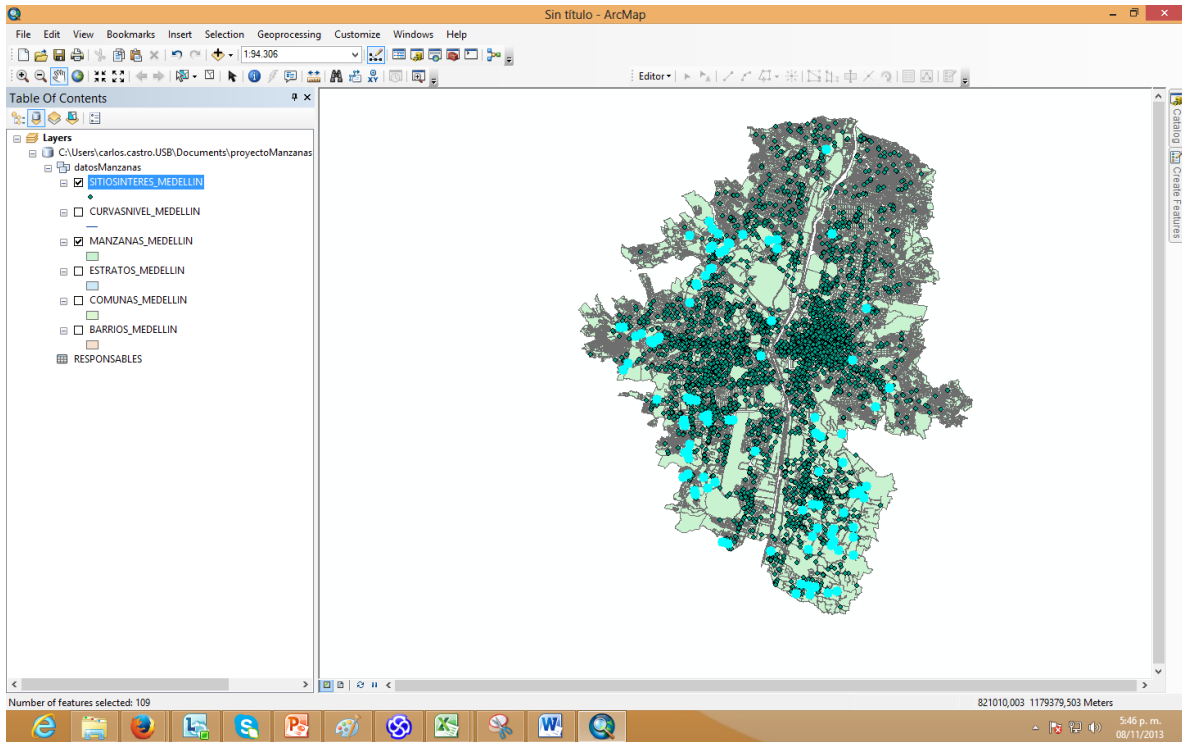
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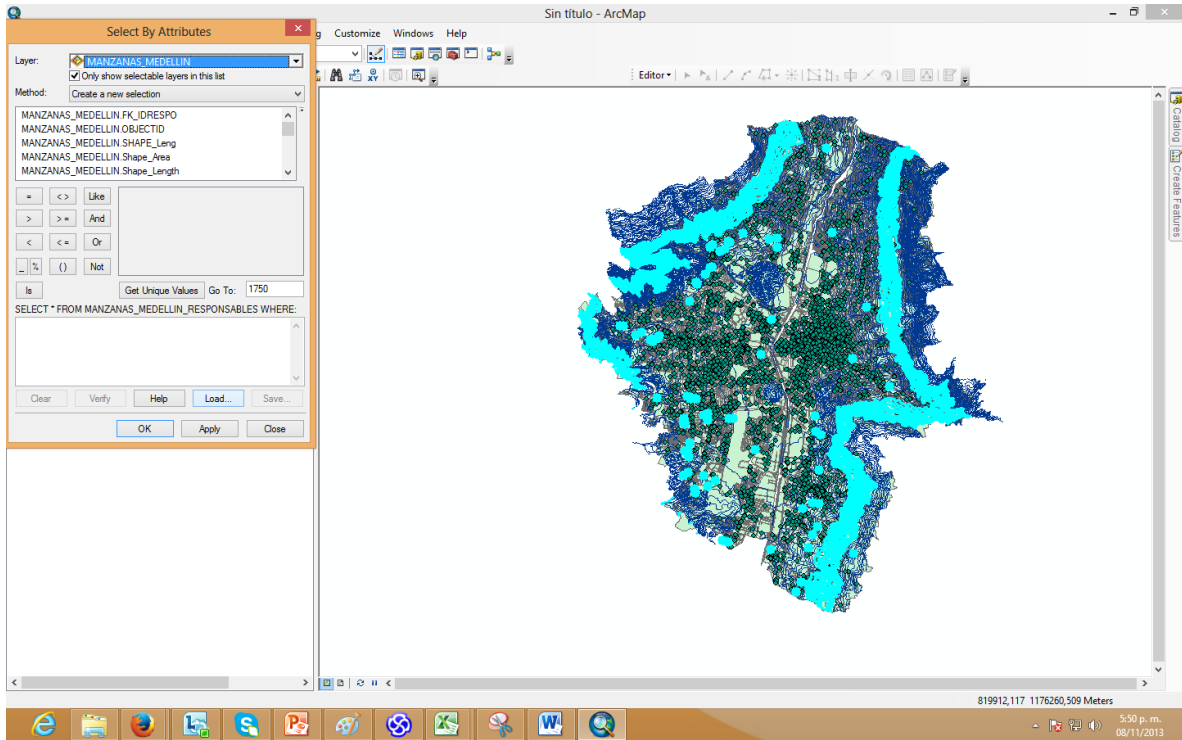
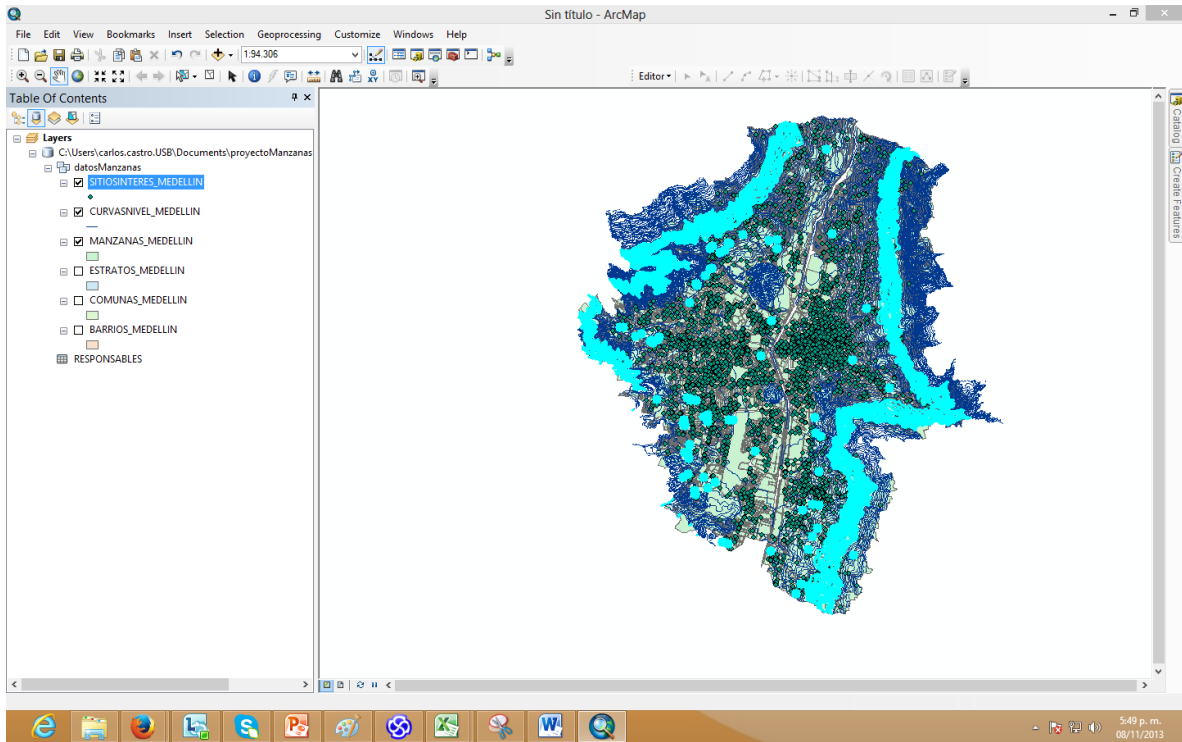
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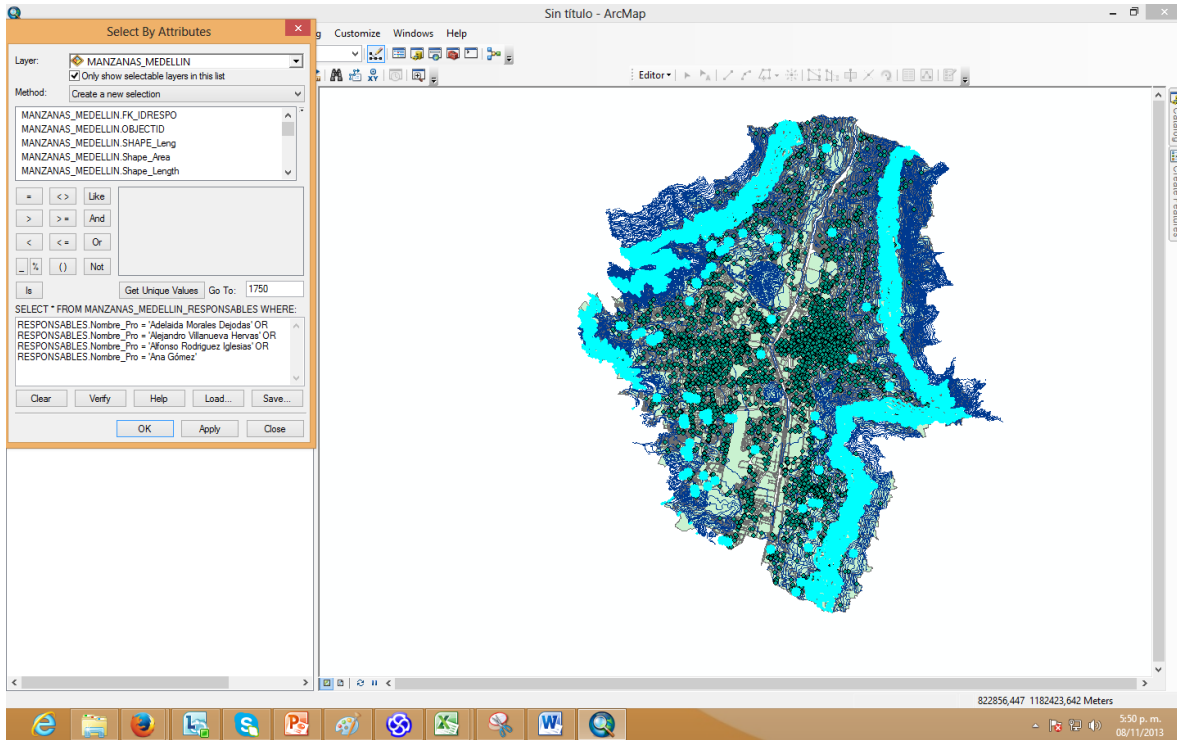
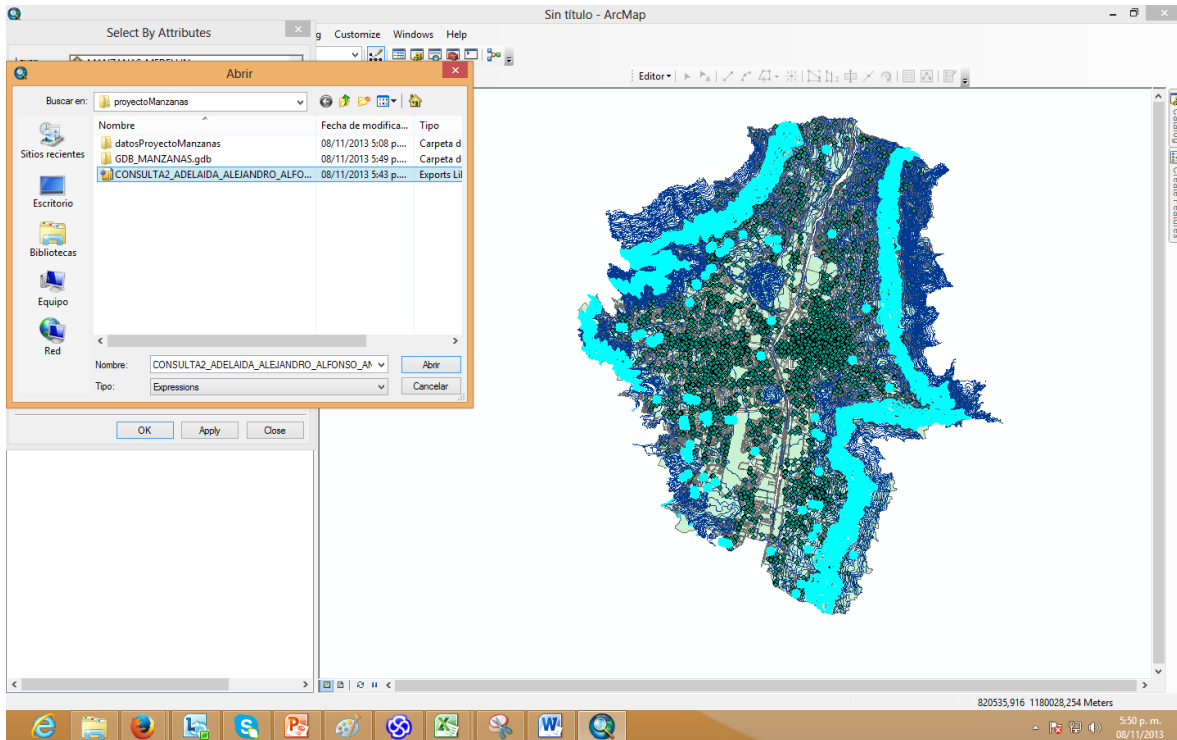


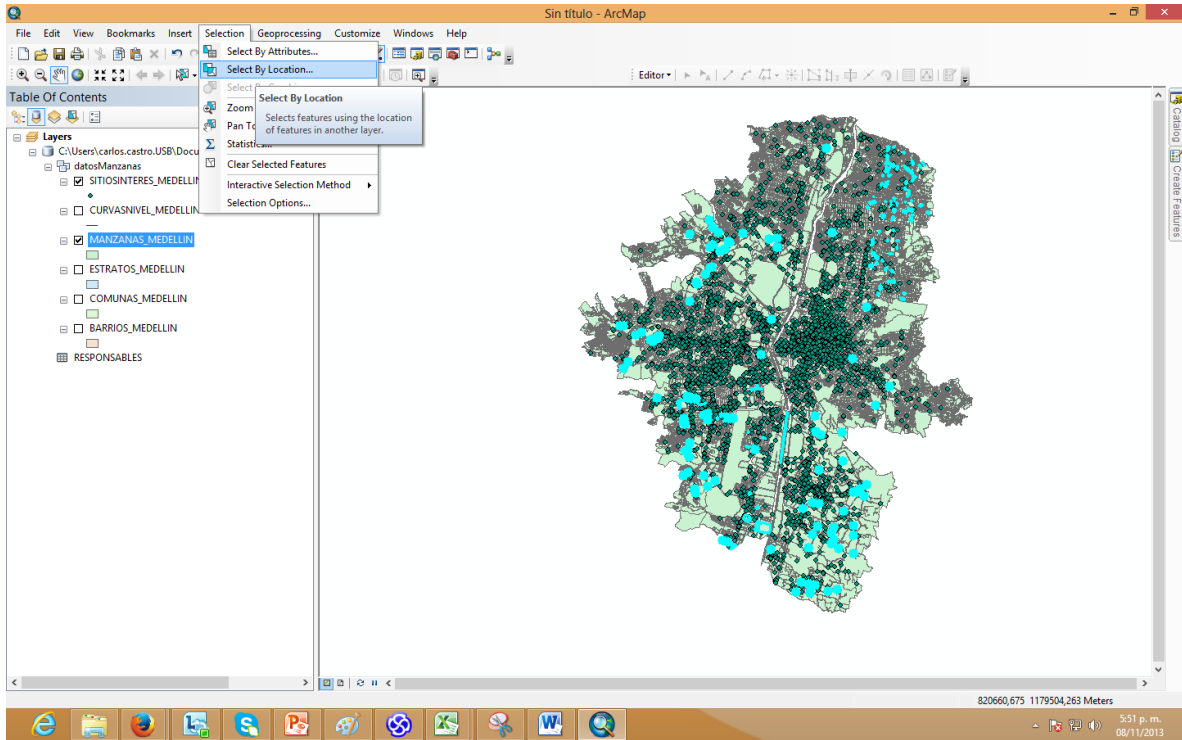
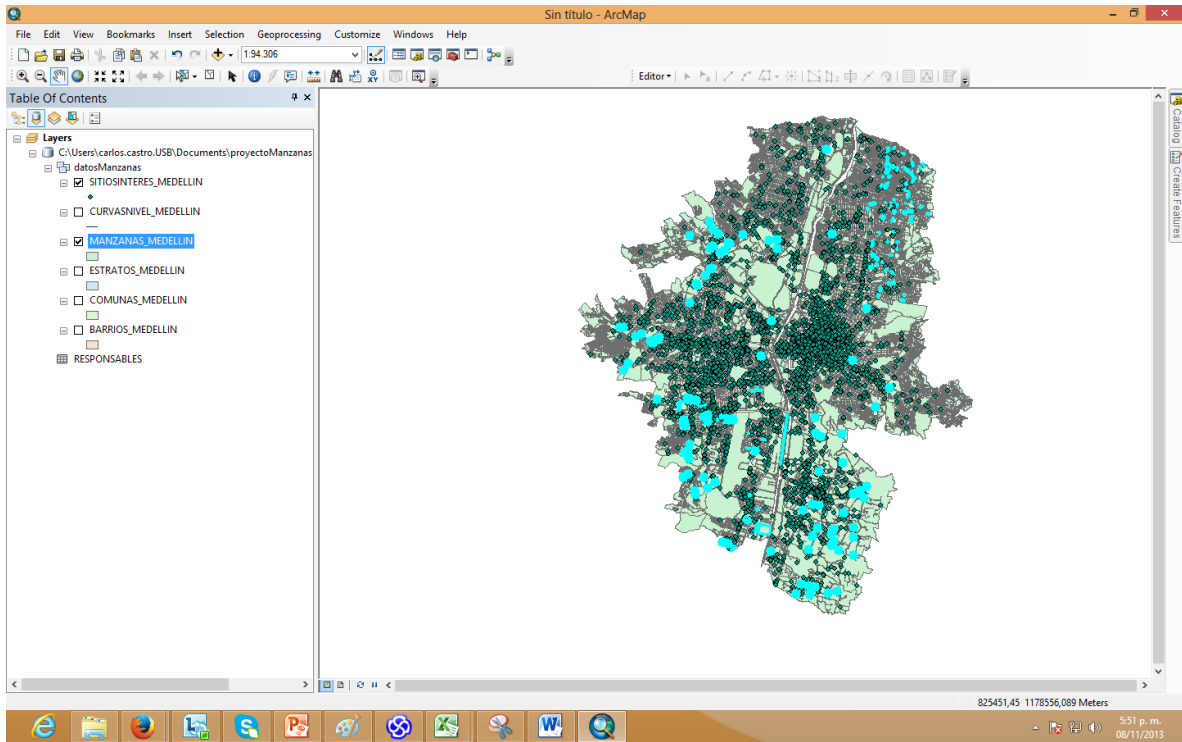
Mostrar Las Urbanizaciones que están a una distancia entre 2000 mt y 4000 mt de las Manzanas que están a una altura entre 1650 y 1750 metros y de las cuales son responsables 'Adelaida Morales Dejodas', 'Alejandro Villanueva Hervas', 'Alfonso Rodriguez Iglesias' ó 'Ana Gómez'.



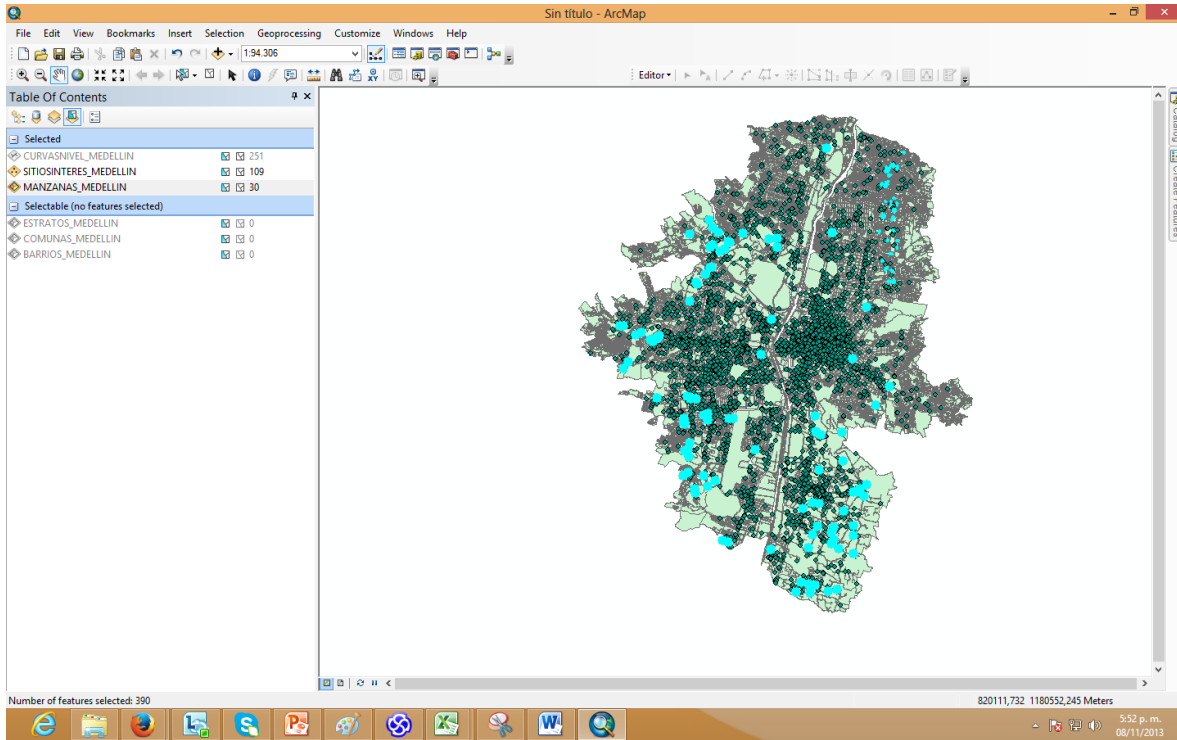
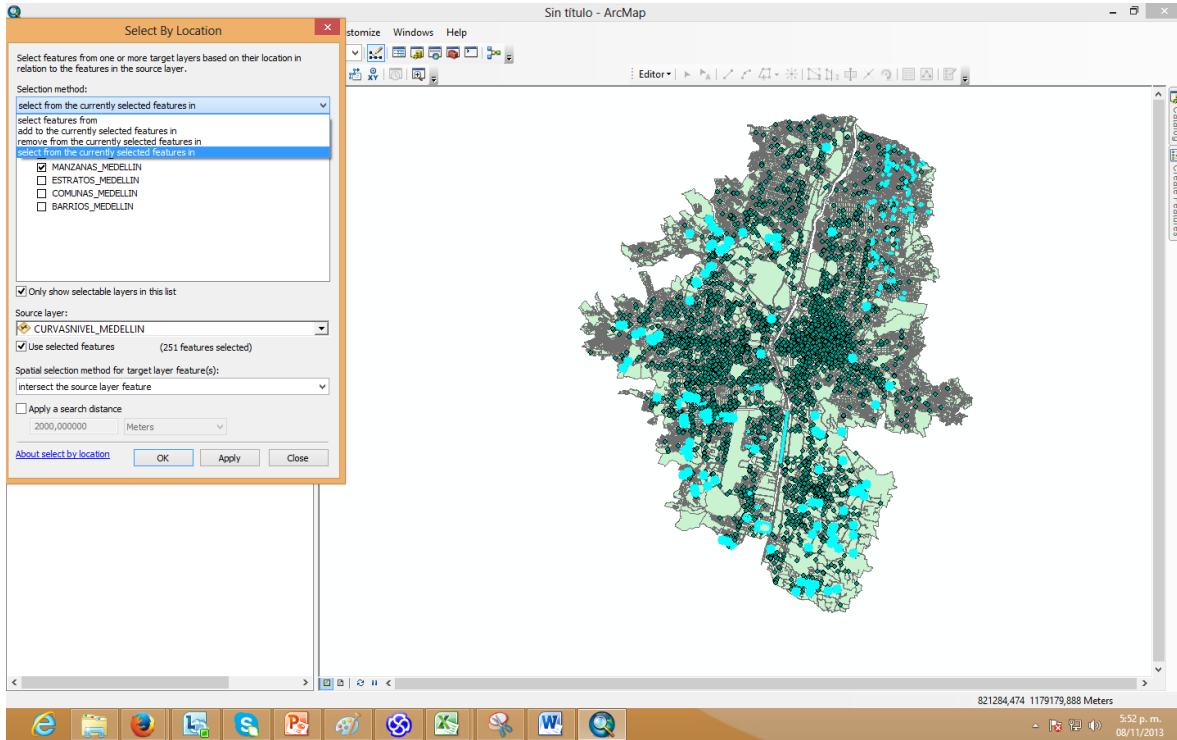


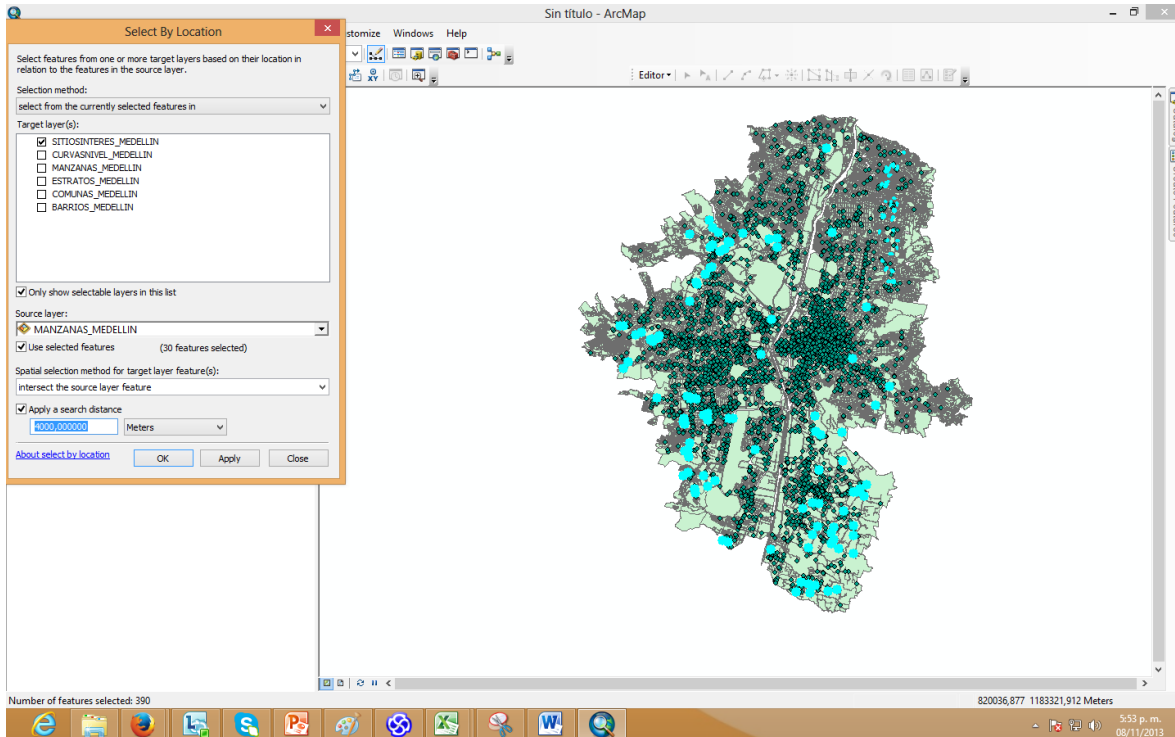
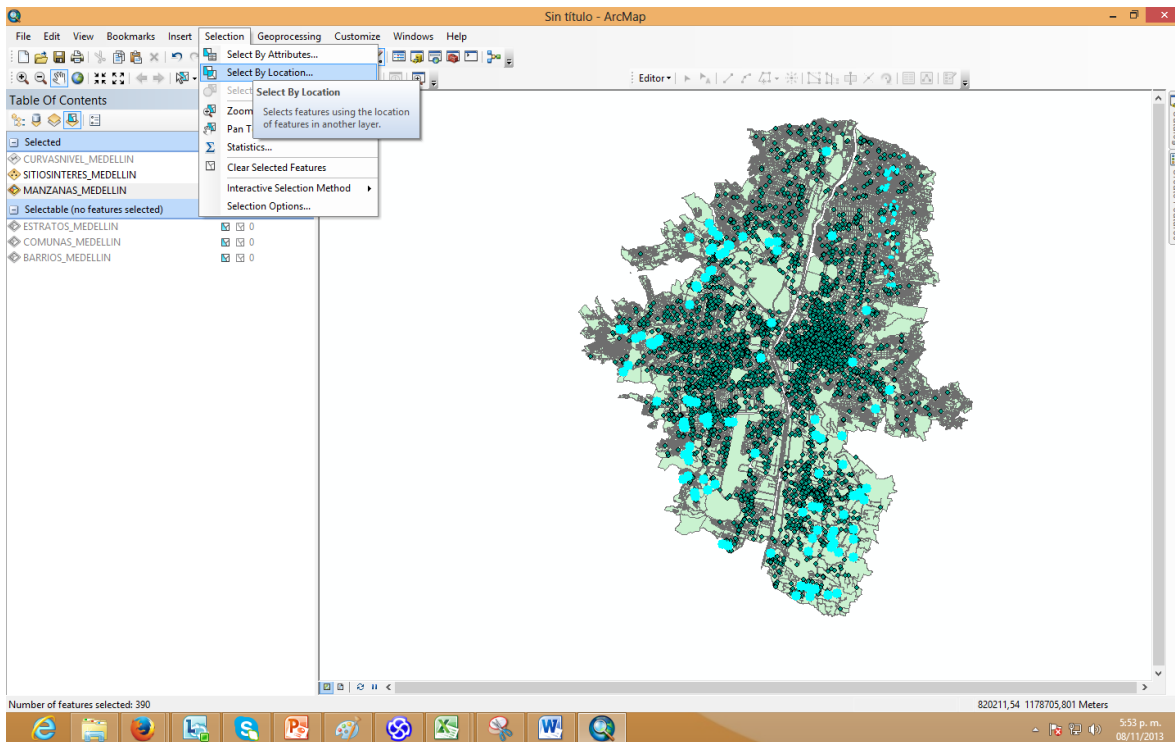


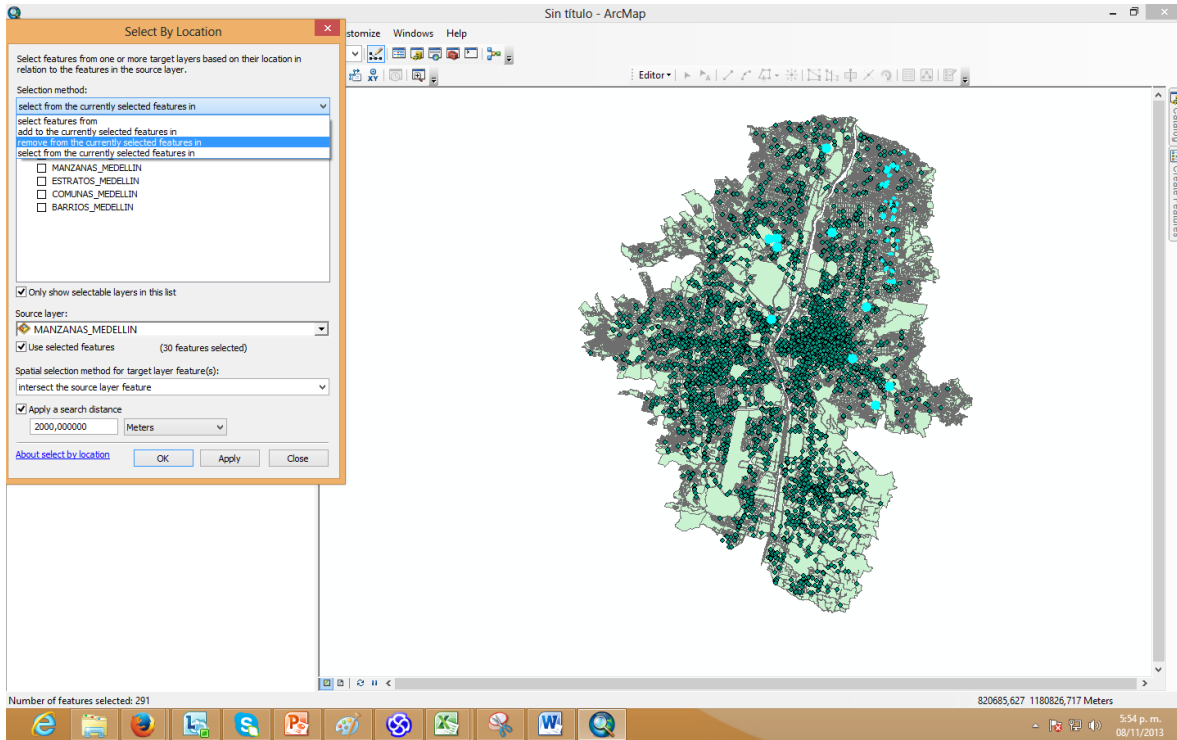
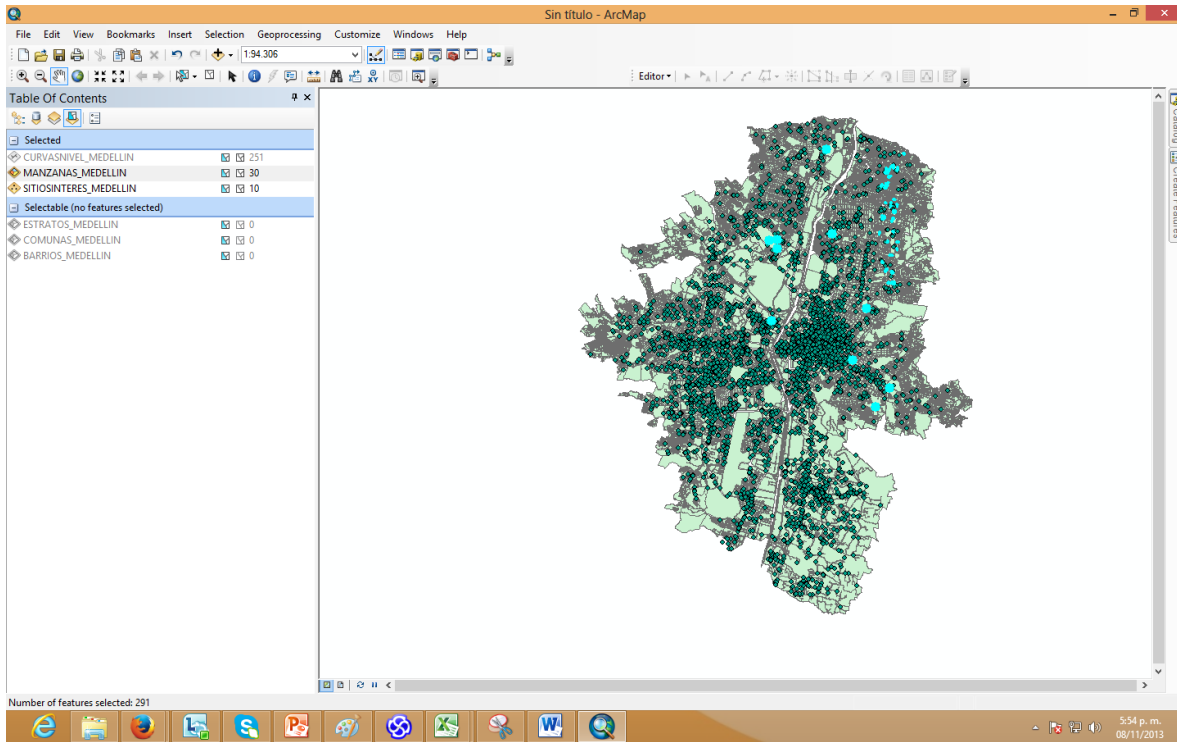


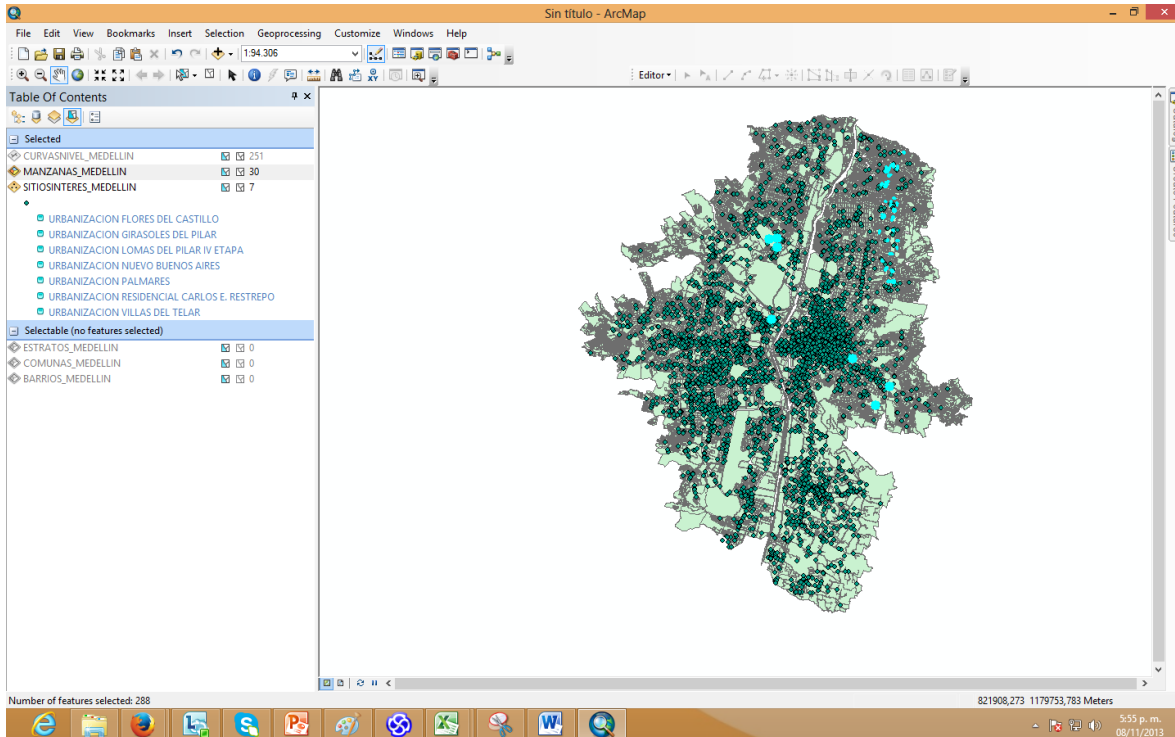
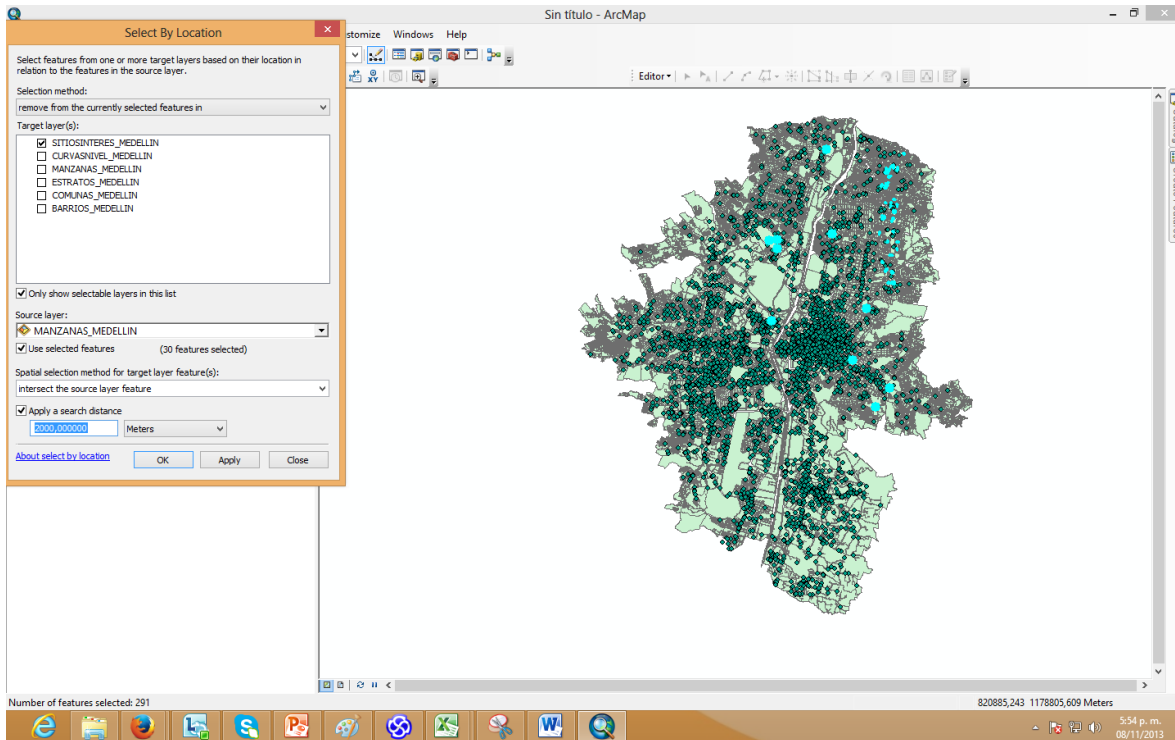






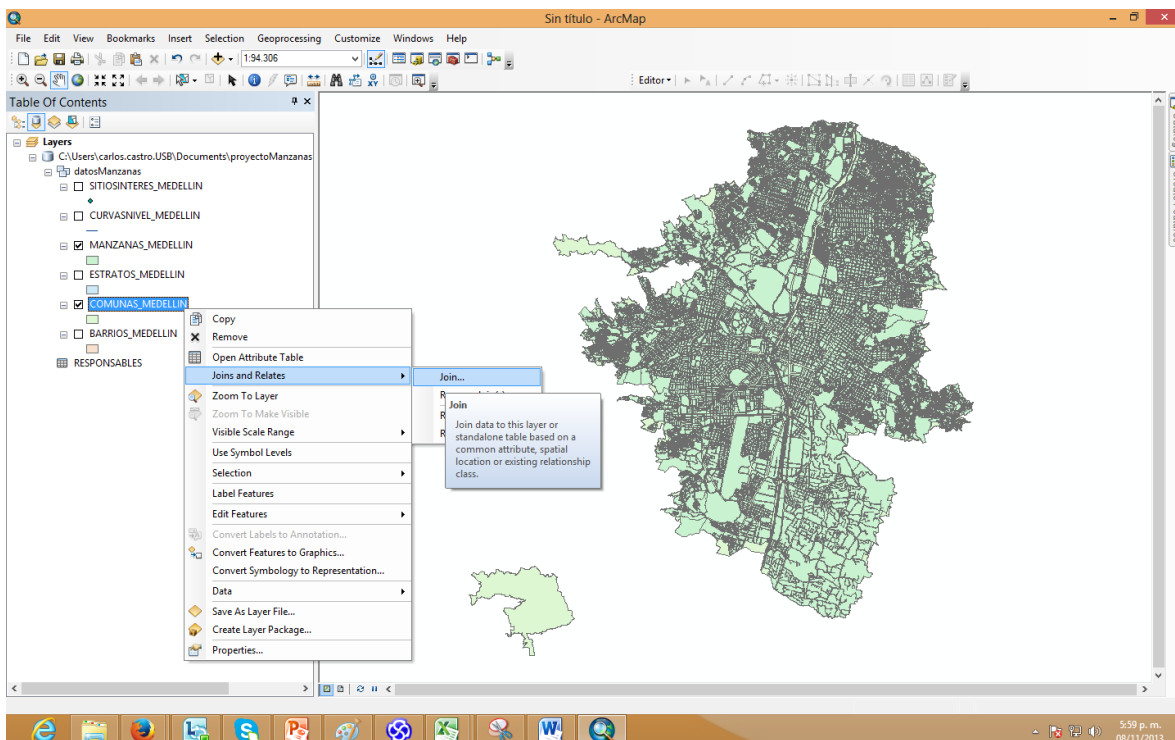
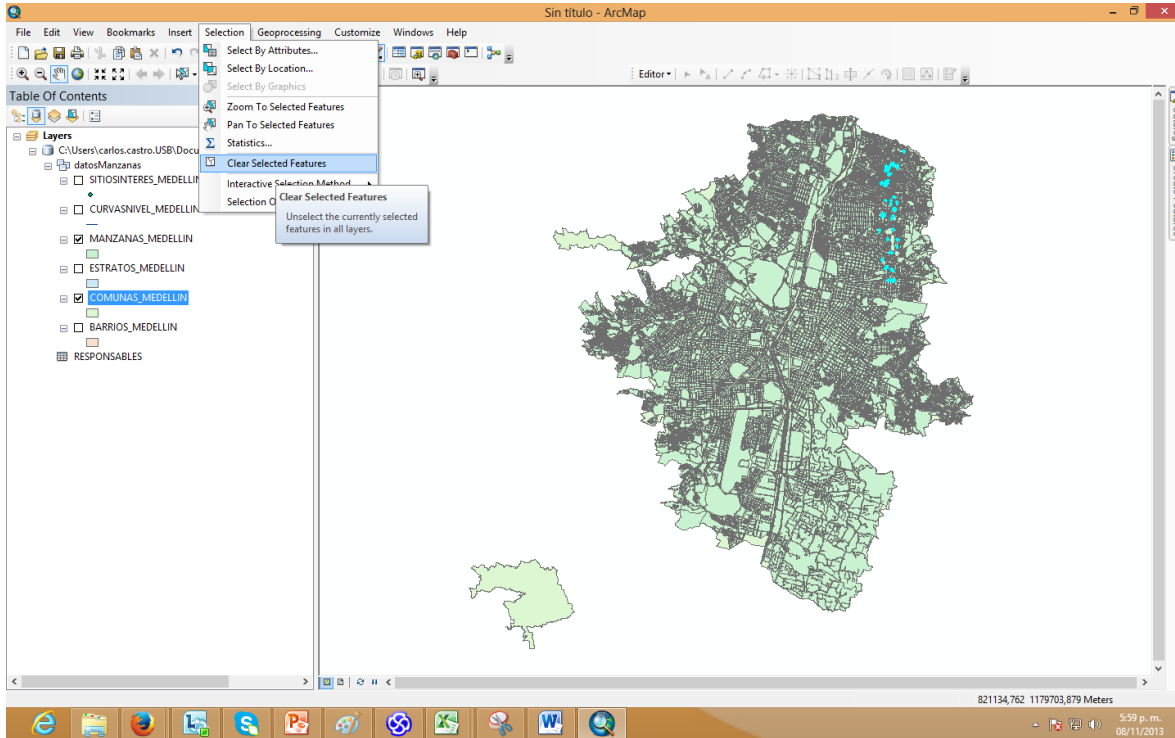


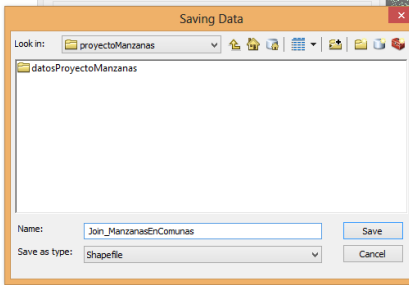
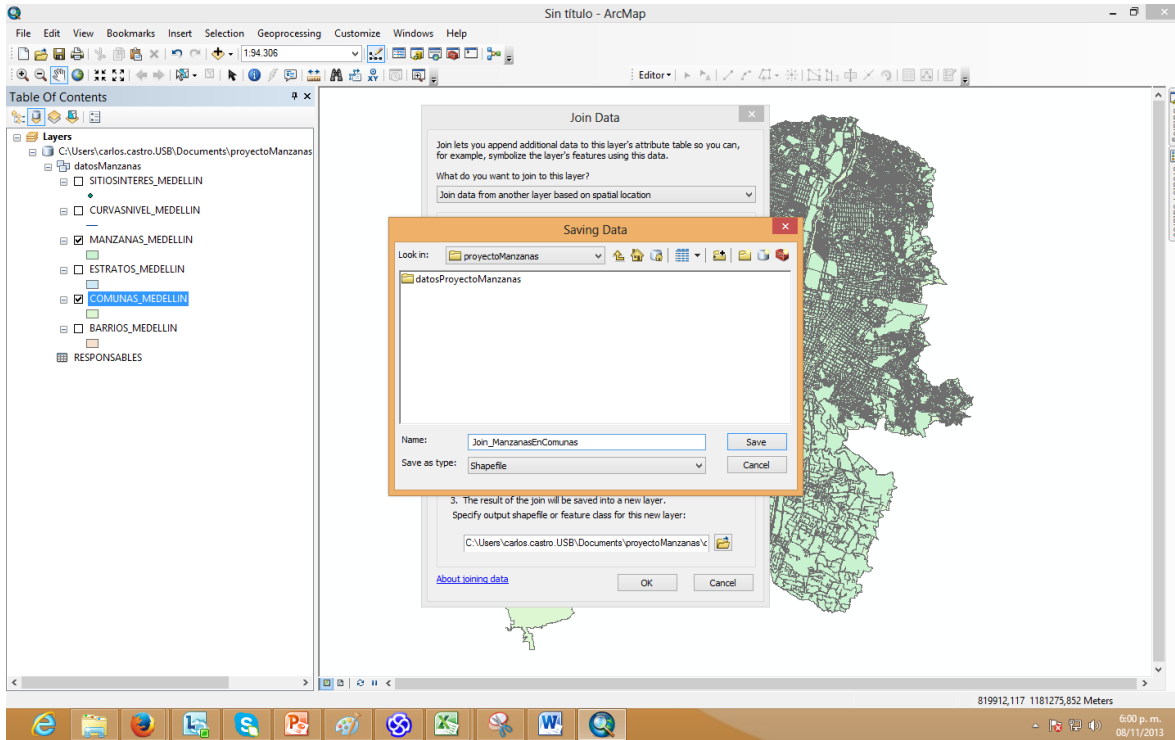
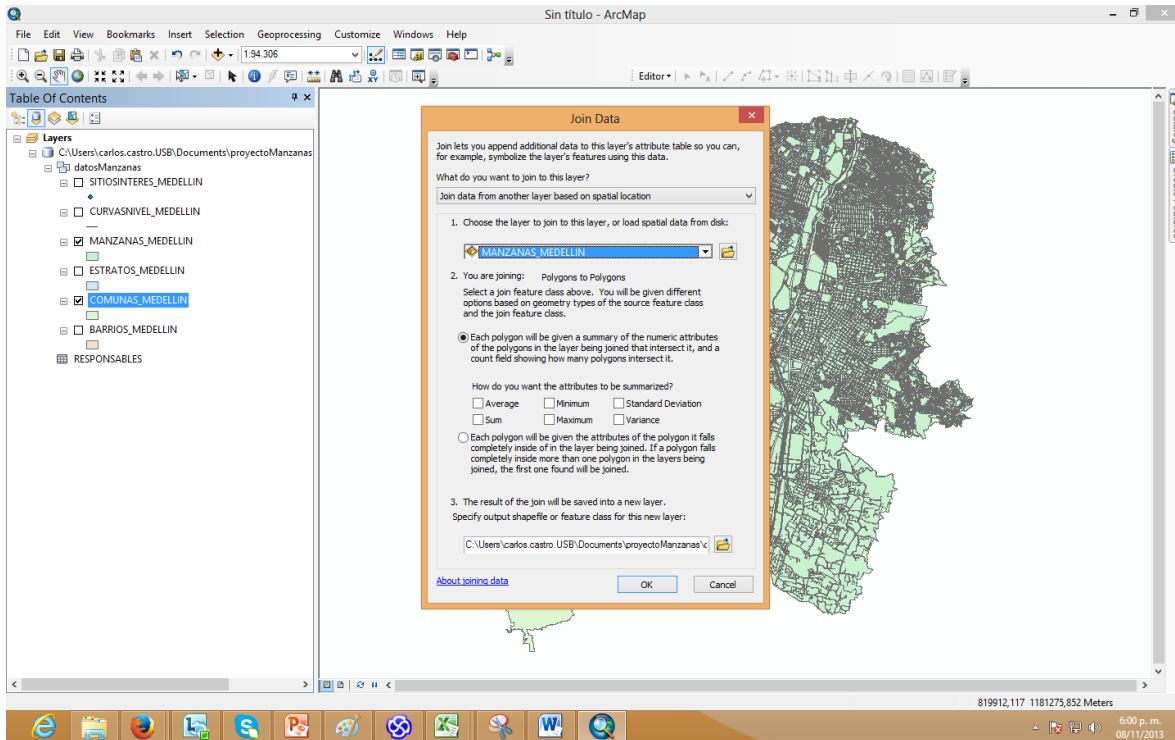


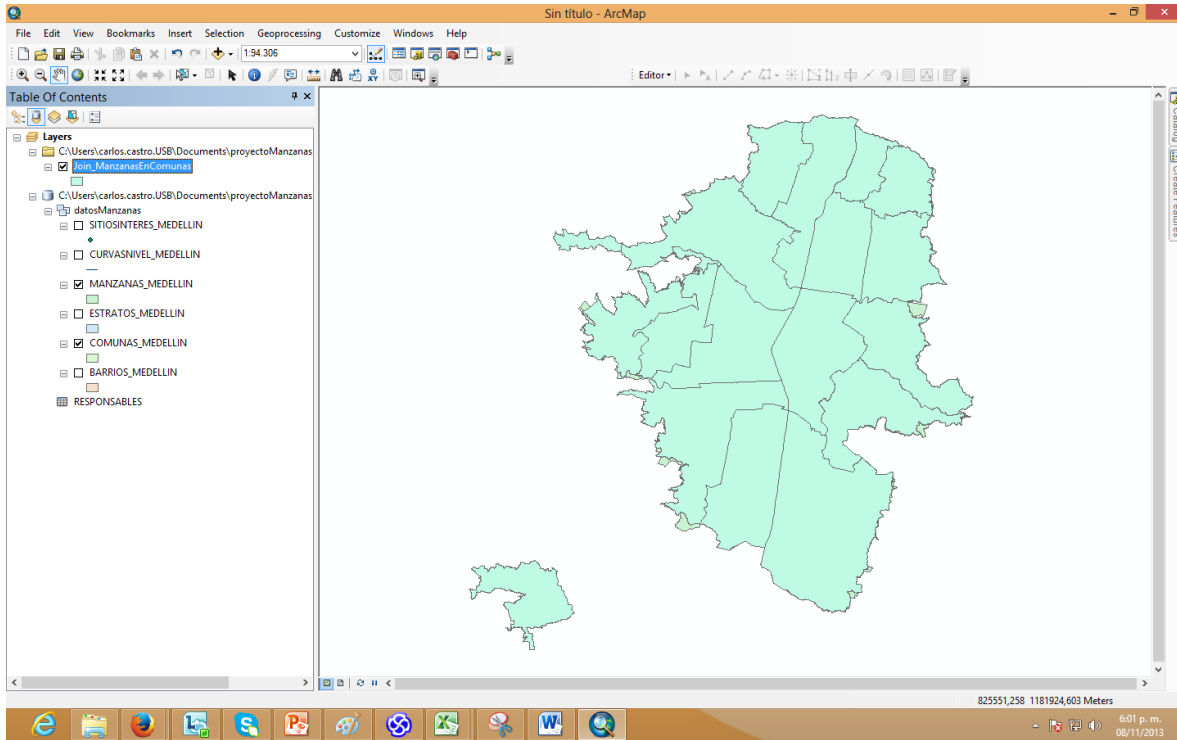
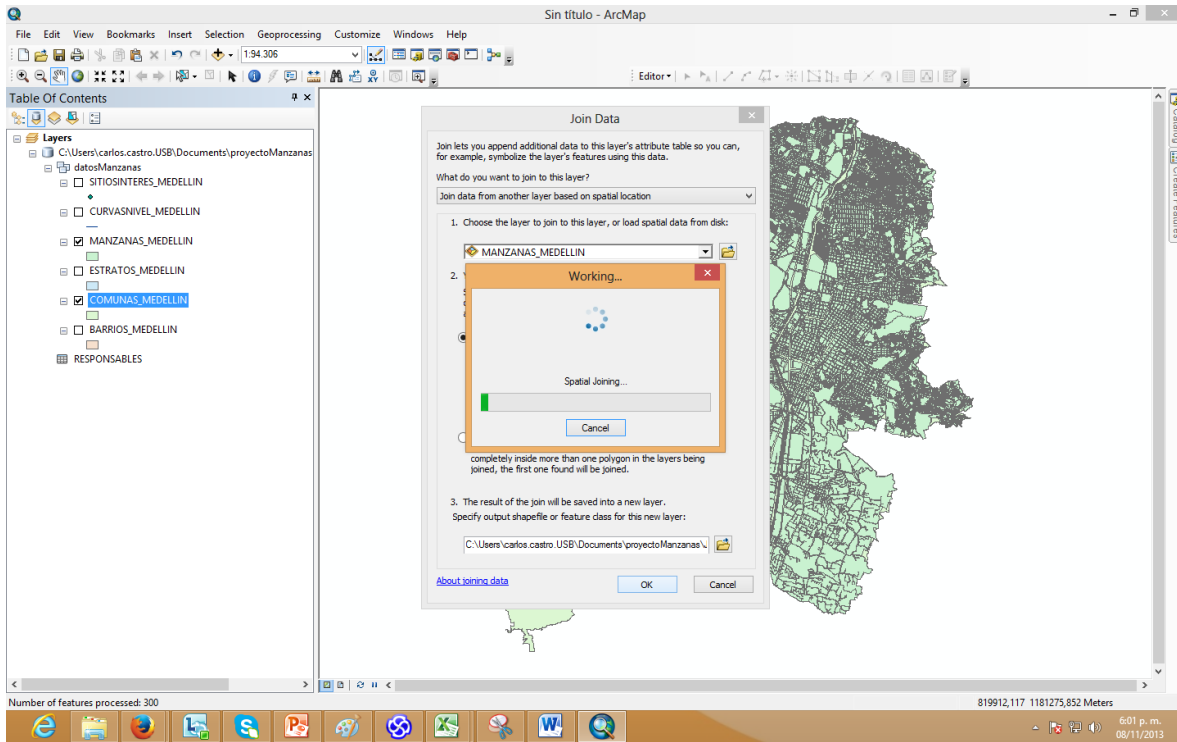


Mostrar las comunas, con el número de Manzanas de cada comuna, que tienen barrios con áreas mayores que 1'000.000 metros cuadrados

Para Obtener las comunas con una columna adicional que contenga el dato de número de manzanas se debe hacer un join espacial con destino en comunas (primero se debe limpiar la selección anterior)







**Table**  
Join\_ManzanasEnComunas

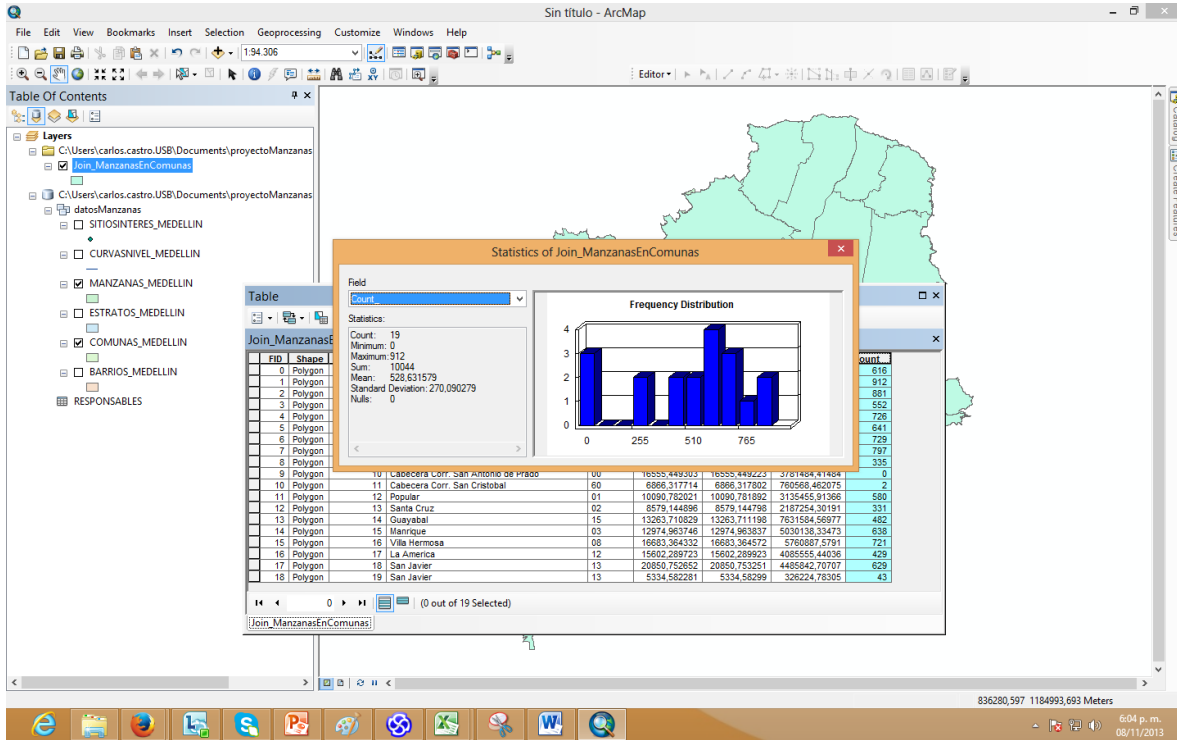
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1	Polygon	2	Doce de Octubre	06	10756.74049	10756.740594	3894515.97267	912
2	Polygon	3	Robledo	07	23398.752661	23398.752124	9354673.1674	881
3	Polygon	4	Aranjuez	04	9798.008326	9798.008284	4863513.11201	552
4	Polygon	5	La Candelaria	10	13846.369554	13846.369682	7364092.6087	726
5	Polygon	6	Laureles - Estado	11	15829.174608	15829.174599	7299544.11564	641
6	Polygon	7	Buenos Aires	09	18512.202241	18512.202156	6051251.92759	729
7	Polygon	8	Beñen	16	25355.959352	25355.959981	8854432.55741	797
8	Polygon	9	Ei Pobado	14	20145.54619	20145.546077	14522427.9076	335
9	Polygon	10	Cabecera Corr. San Antonio de Prado	00	16555.449303	16555.449223	3781484.41484	0
10	Polygon	11	Cabecera Corr. San Cratobal	60	6866.317714	6866.317802	760568.462075	-2
11	Polygon	12	Popular	01	10090.762221	10090.761992	3135455.91366	580
12	Polygon	13	Santa Cruz	02	8579.144986	8579.144796	2187254.30191	331
13	Polygon	14	Guayabal	15	13263.710829	13263.711198	7631584.56977	482
14	Polygon	15	Manrique	03	12974.963746	12974.963837	5030138.3473	636
15	Polygon	16	Vila Hermosa	08	16683.384332	16683.384572	5766887.5791	721
16	Polygon	17	La America	12	15602.289723	15602.289923	4085555.44036	429
17	Polygon	18	San Javier	13	20850.752652	20850.753251	4485842.70707	629
18	Polygon	19	San Javier	13	5334.582281	5334.58299	326224.78305	43

**Table**  
Join\_ManzanasEnComunas

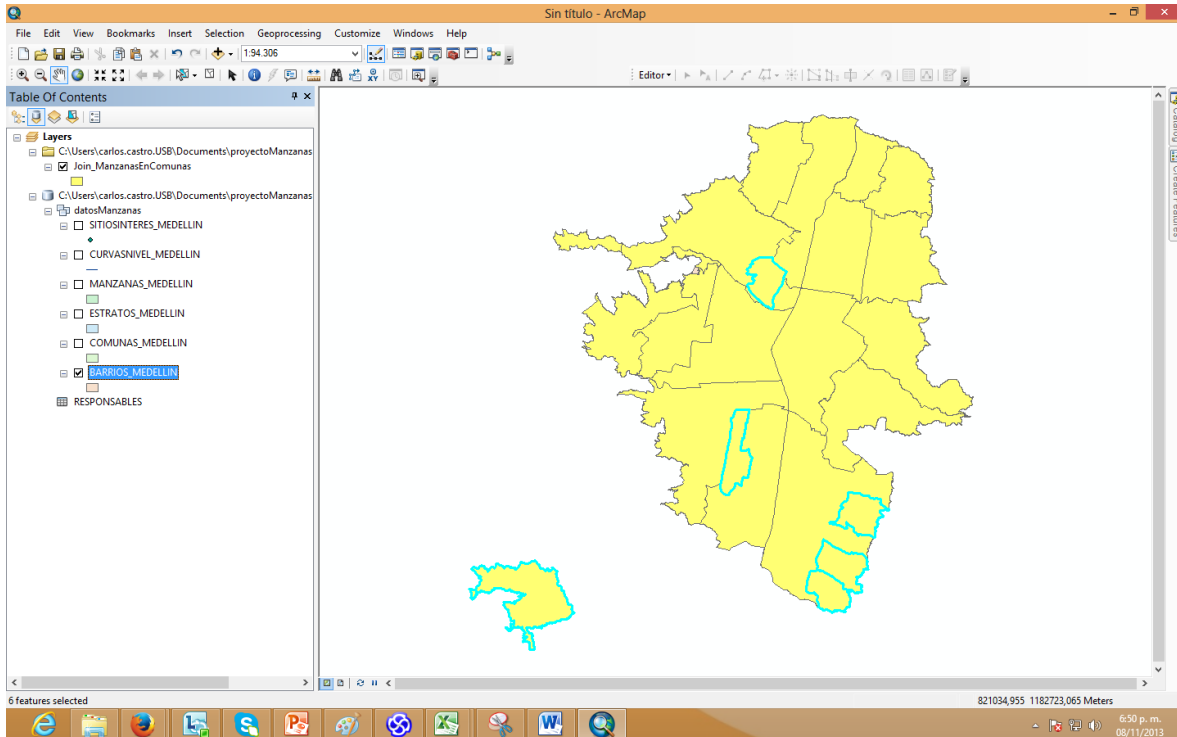
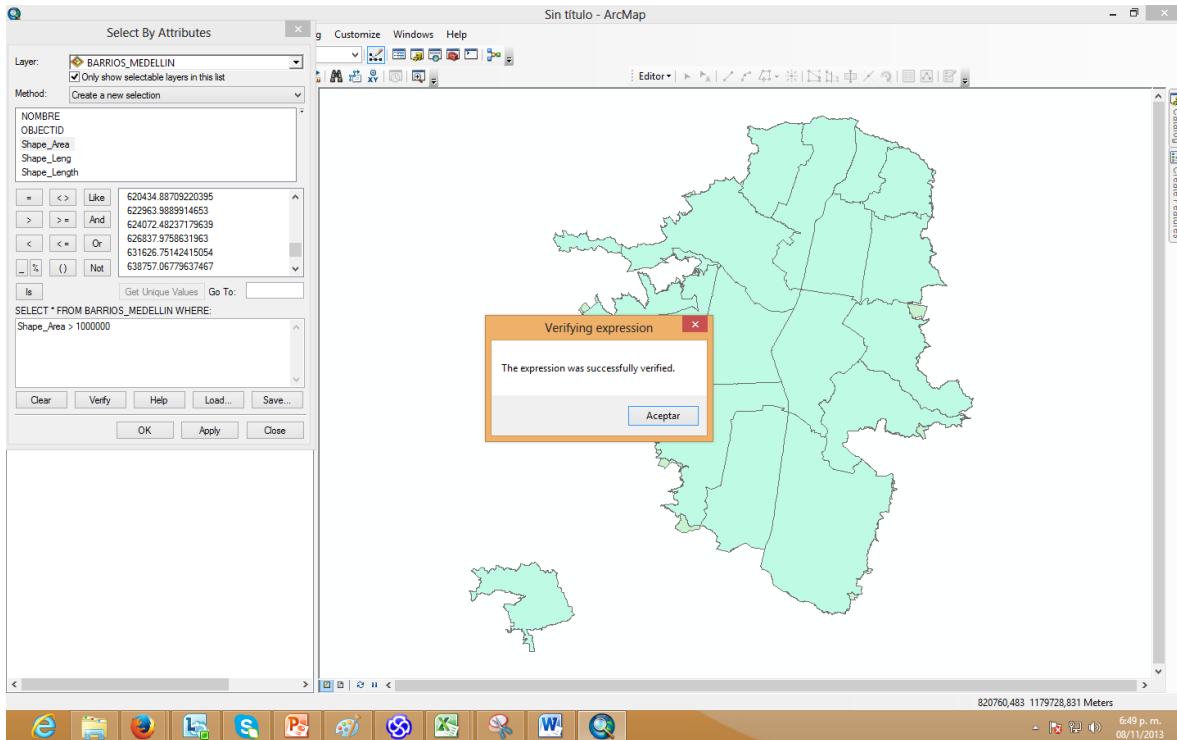
FID	Shape	OBJECTID	NOMBRE	Comuna	Shape Leng	Shape Le 1	Shape Area	Count
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1	Polygon	2	Doce de Octubre	06	10756.74049	10756.740594	3894515.97267	912
2	Polygon	3	Robledo	07	23398.752661	23398.752124	9354673.1674	881
3	Polygon	4	Aranjuez	04	9798.008326	9798.008284	4863513.11201	552
4	Polygon	5	La Candelaria	10	13846.369554	13846.369682	7364092.6087	726
5	Polygon	6	Laureles - Estado	11	15829.174608	15829.174599	7299544.11564	641
6	Polygon	7	Buenos Aires	09	18512.202241	18512.202156	6051251.92759	729
7	Polygon	8	Beñen	16	25355.959352	25355.959981	8854432.55741	797
8	Polygon	9	Ei Pobado	14	20145.54619	20145.546077	14522427.9076	335
9	Polygon	10	Cabecera Corr. San Antonio de Prado	00	16555.449303	16555.449223	3781484.41484	0
10	Polygon	11	Cabecera Corr. San Cratobal	60	6866.317714	6866.317802	760568.462075	-2
11	Polygon	12	Popular	01	10090.762221	10090.761992	3135455.91366	580
12	Polygon	13	Santa Cruz	02	8579.144986	8579.144796	2187254.30191	331
13	Polygon	14	Guayabal	15	13263.710829	13263.711198	7631584.56977	482
14	Polygon	15	Manrique	03	12974.963746	12974.963837	5030138.3473	636
15	Polygon	16	Vila Hermosa	08	16683.384332	16683.384572	5766887.5791	721
16	Polygon	17	La America	12	15602.289723	15602.289923	4085555.44036	429
17	Polygon	18	San Javier	13	20850.752652	20850.753251	4485842.70707	629
18	Polygon	19	San Javier	13	5334.582281	5334.58299	326224.78305	43

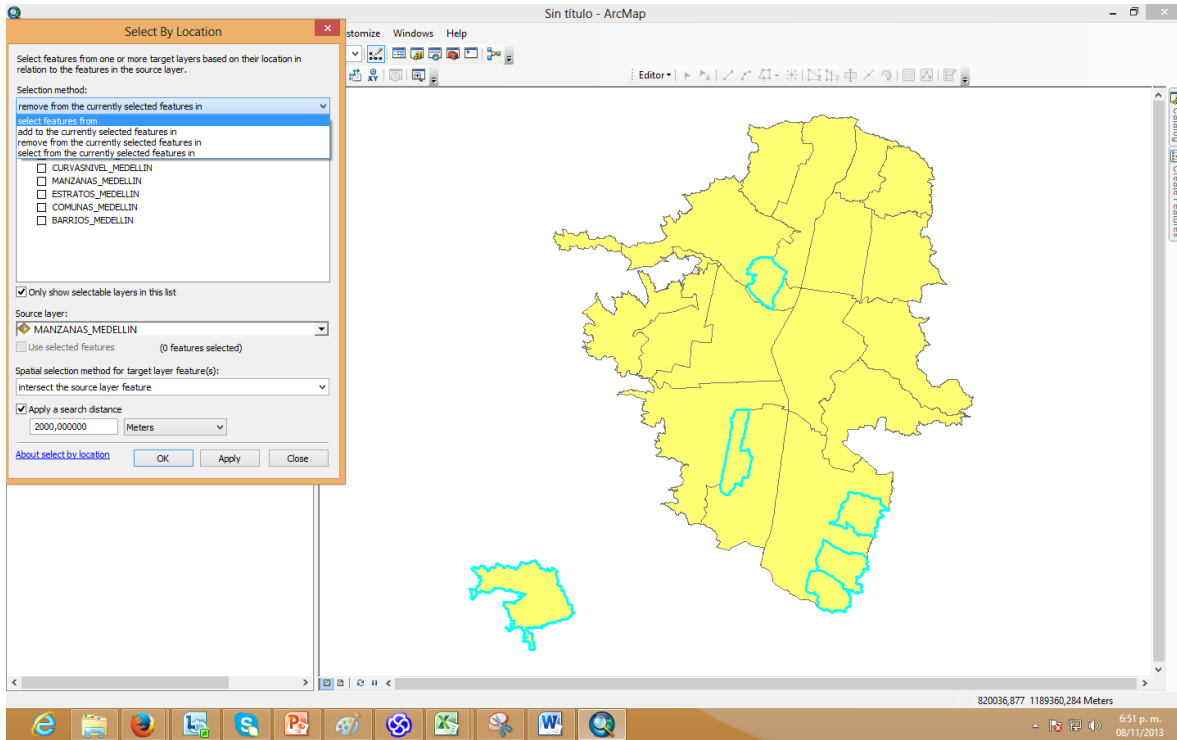
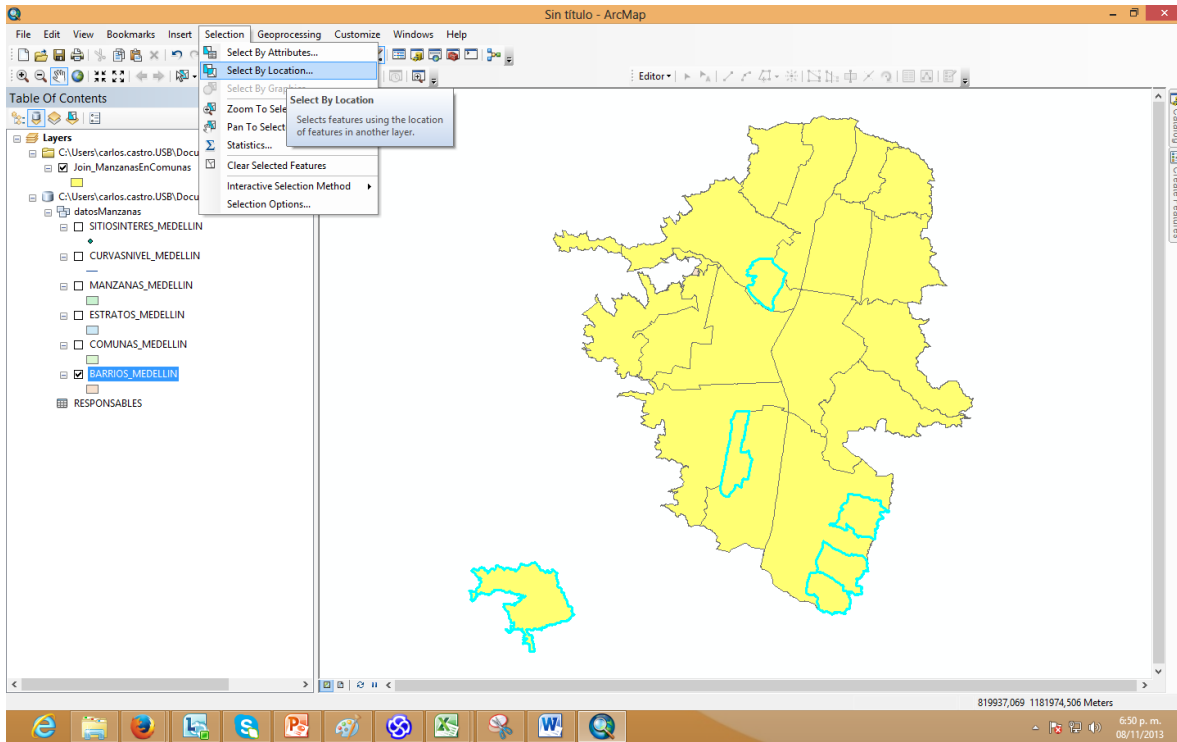
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 Sort Descending  
 Advanced Sorting...  
 Summarize...  
**Statistics...**  
 Field C  
 Statistics  
 Calculate  
 Turn F  
 Freeze  
 Delete  
 Propre

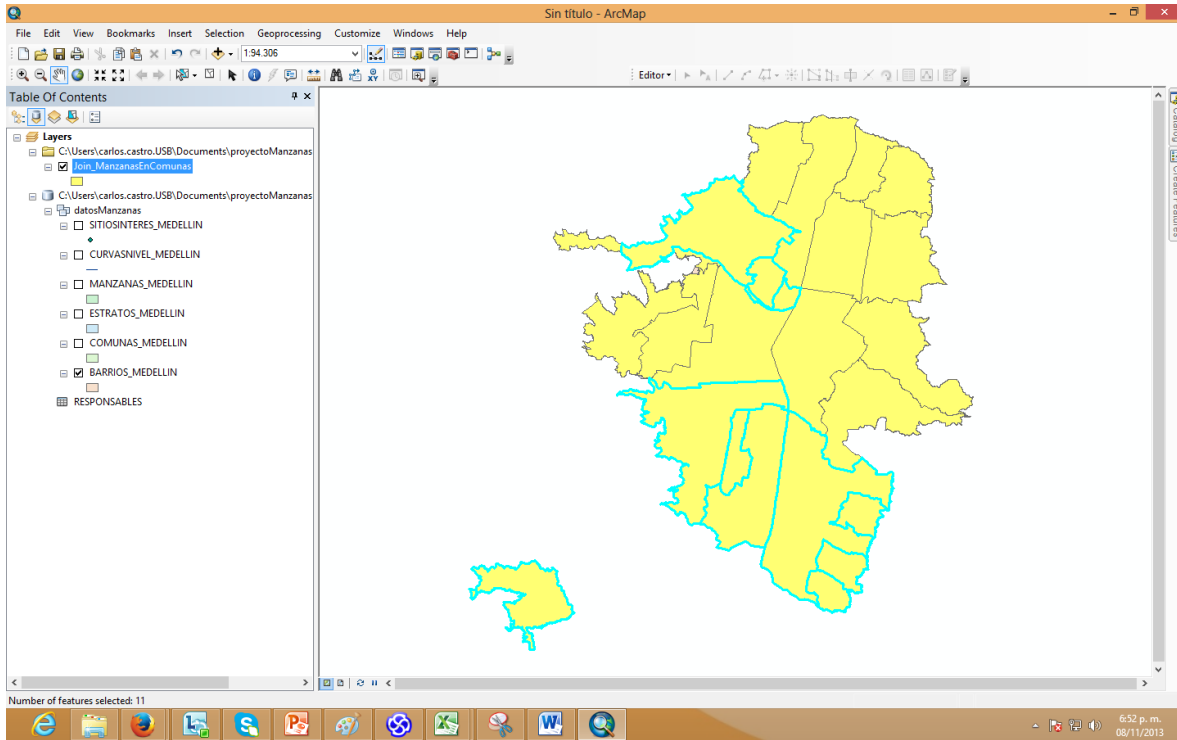
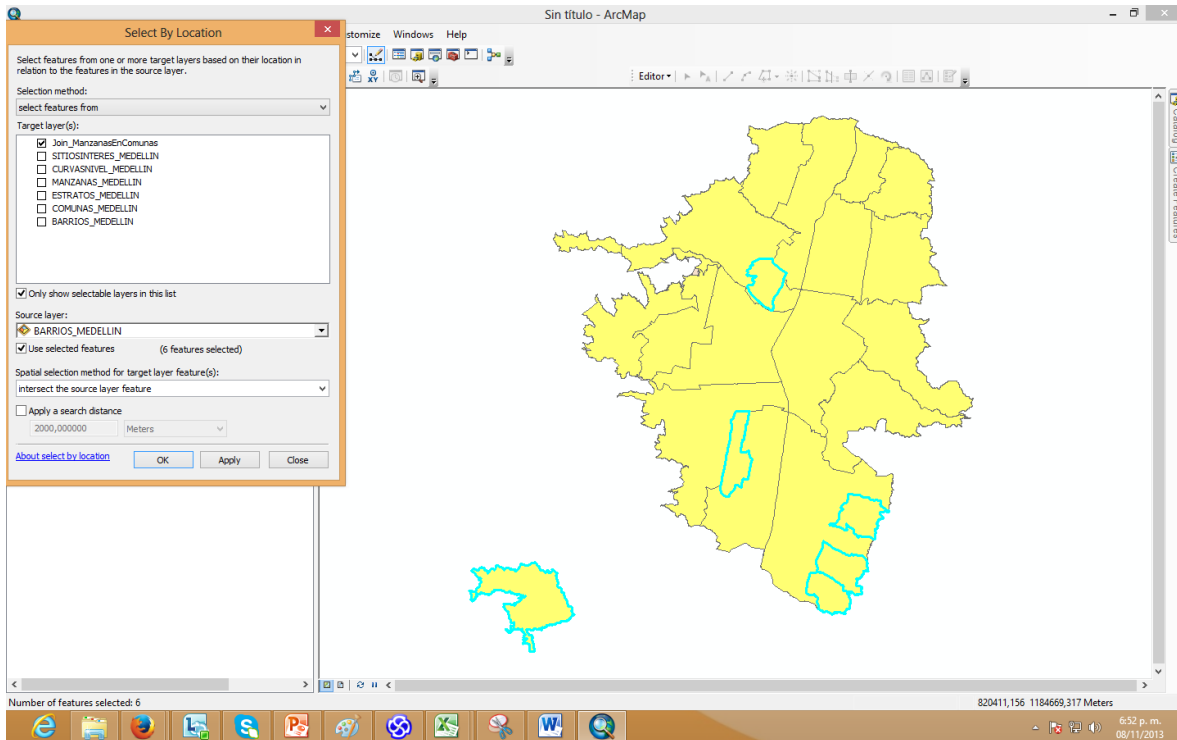


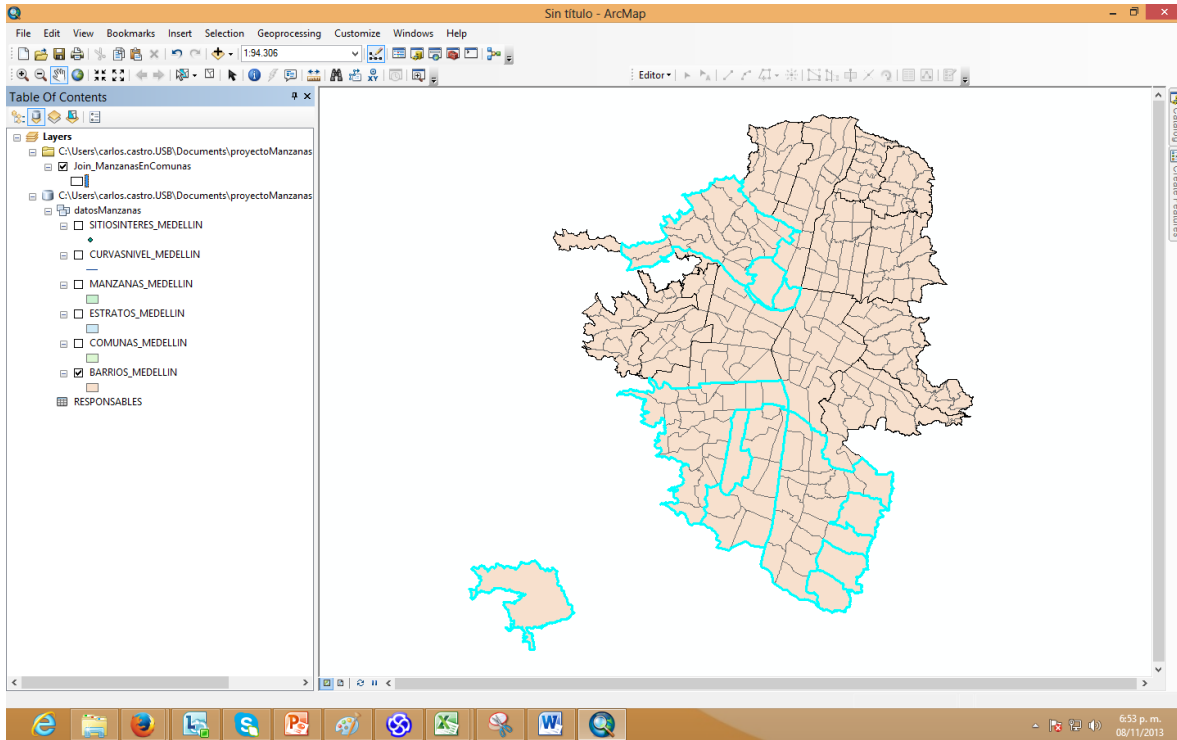
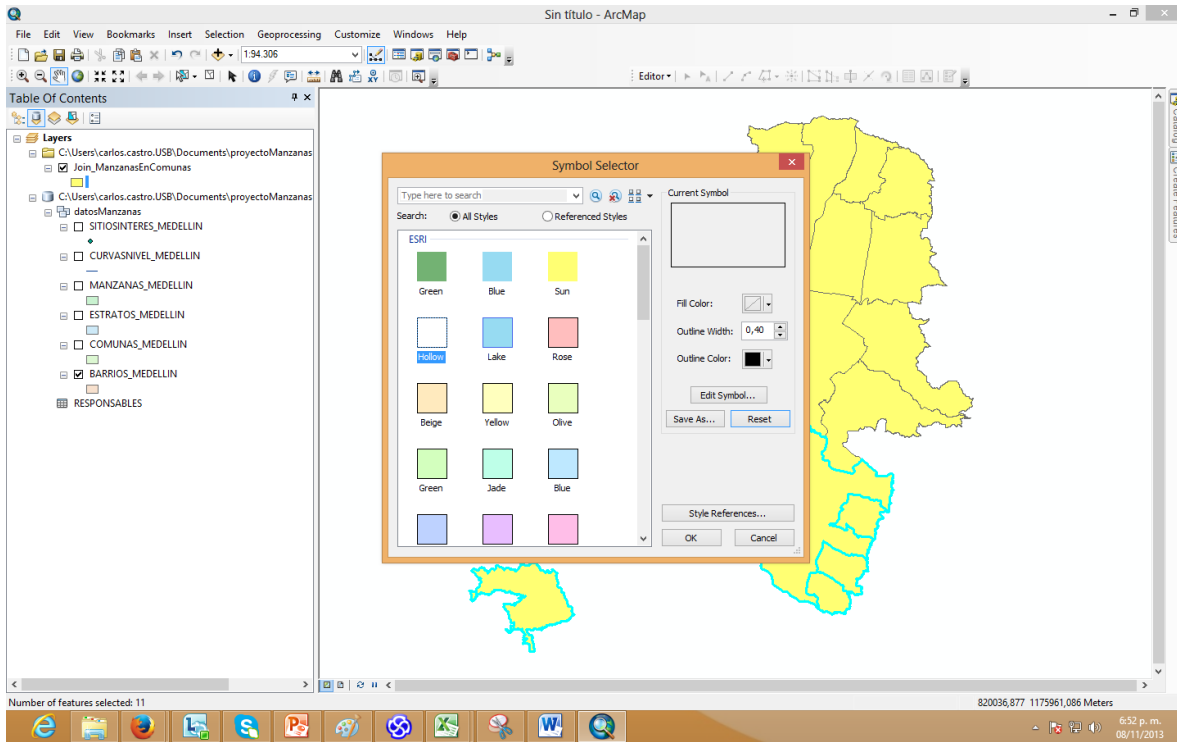


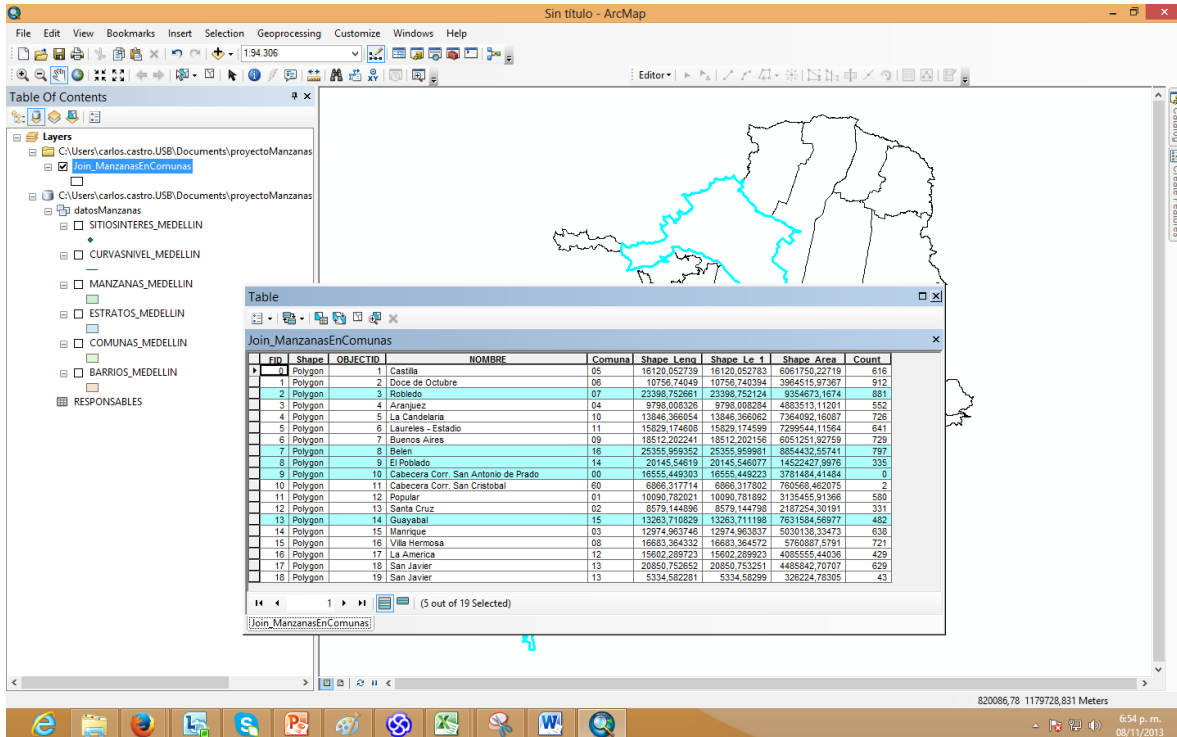
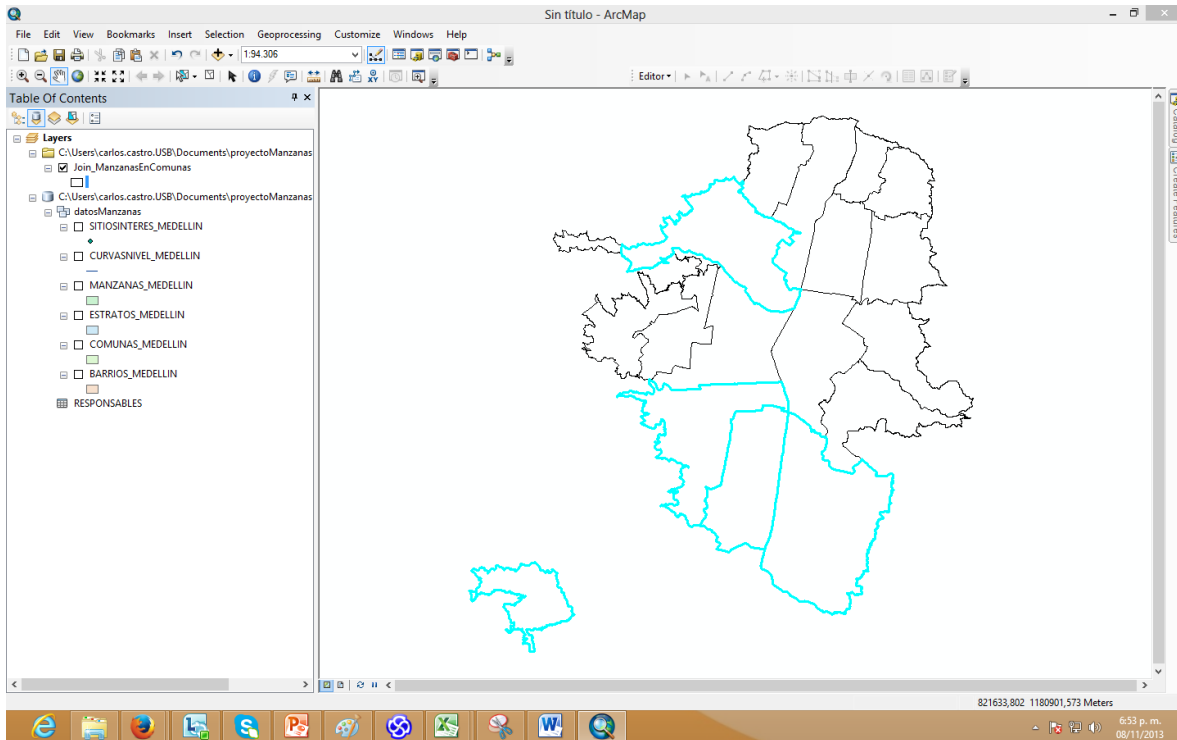
Note en las estadísticas, que la suma es 10044 y el número total de manzanas es 9974. Esto se debe a que hay manzanas en las que algunos bordes del polígono coinciden con los bordes de los polígonos de varias comunas.

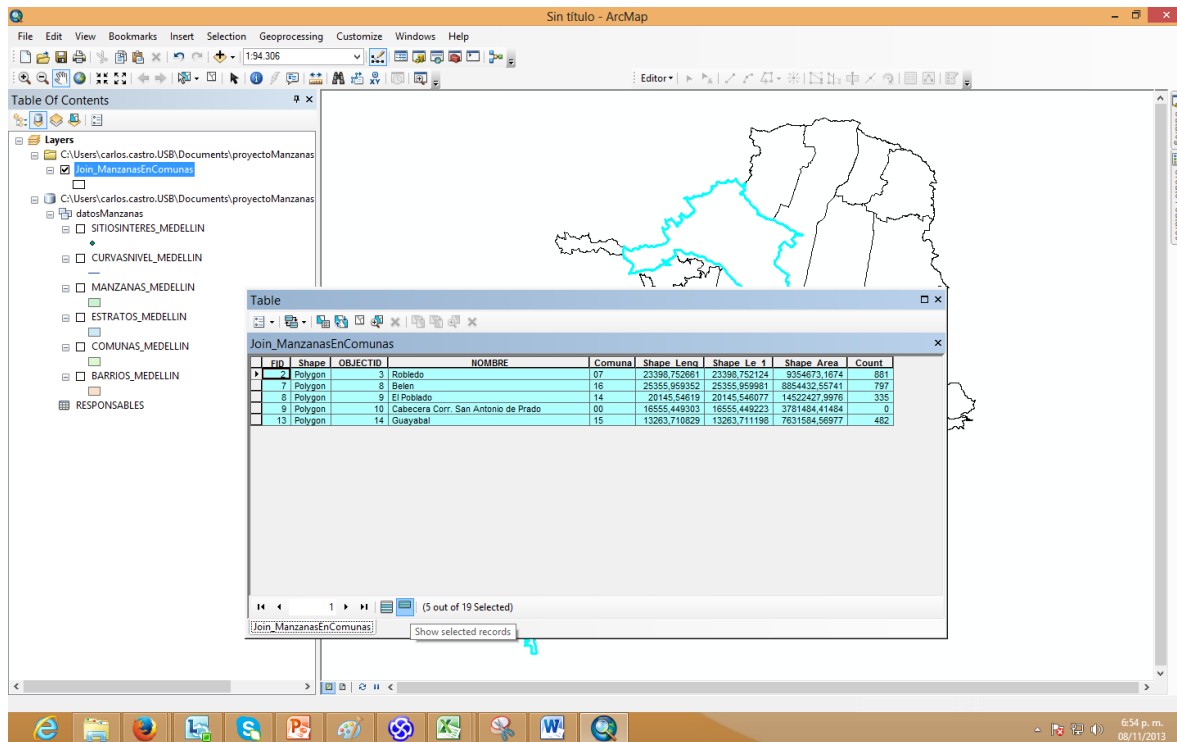




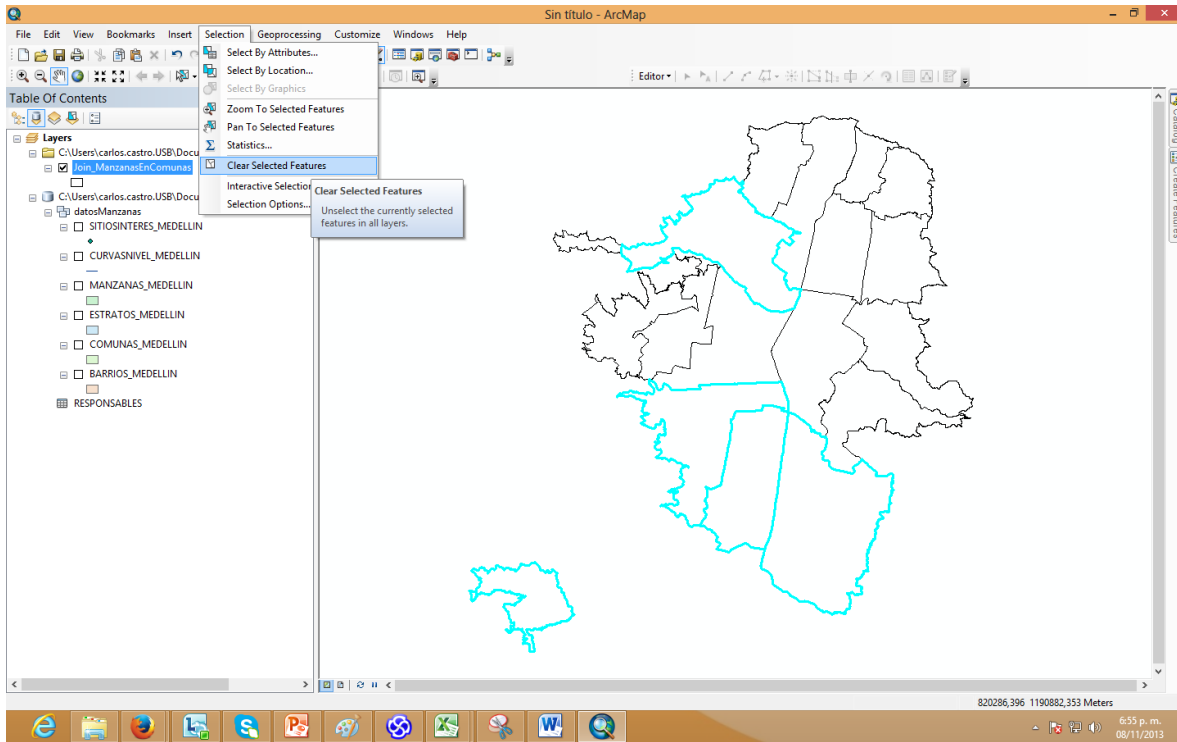




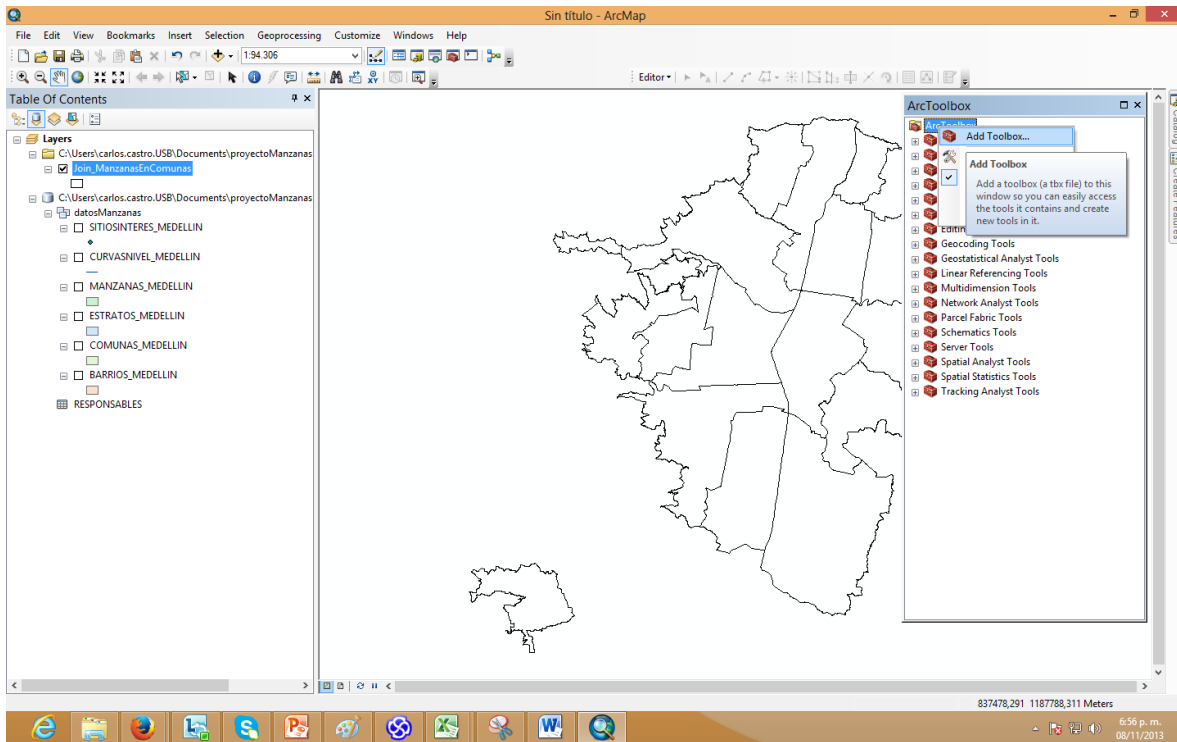




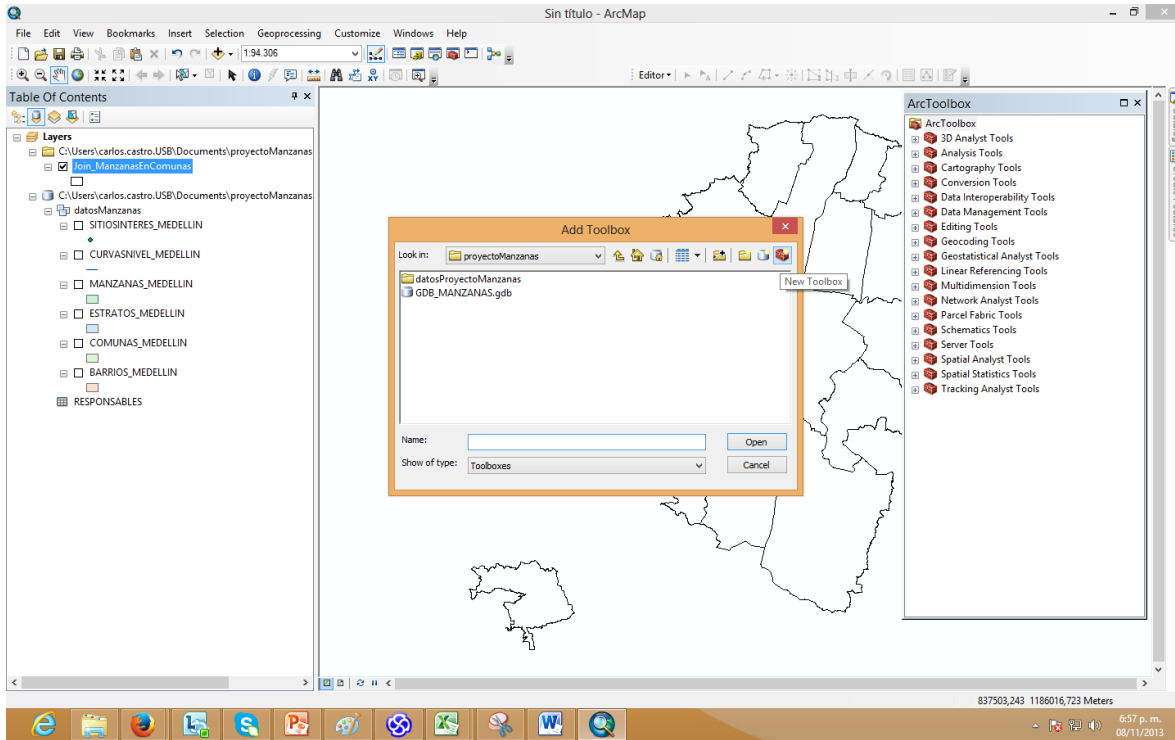
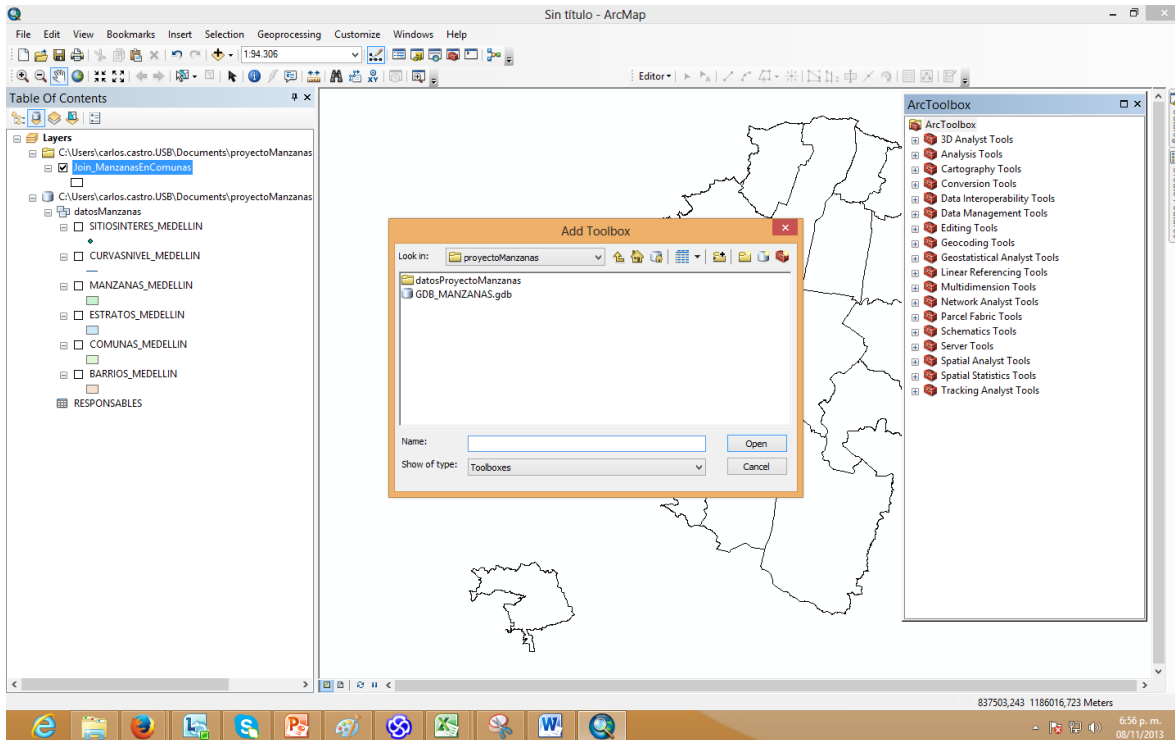
## AUTOMATIZACIÓN CON MODEL BUILDER

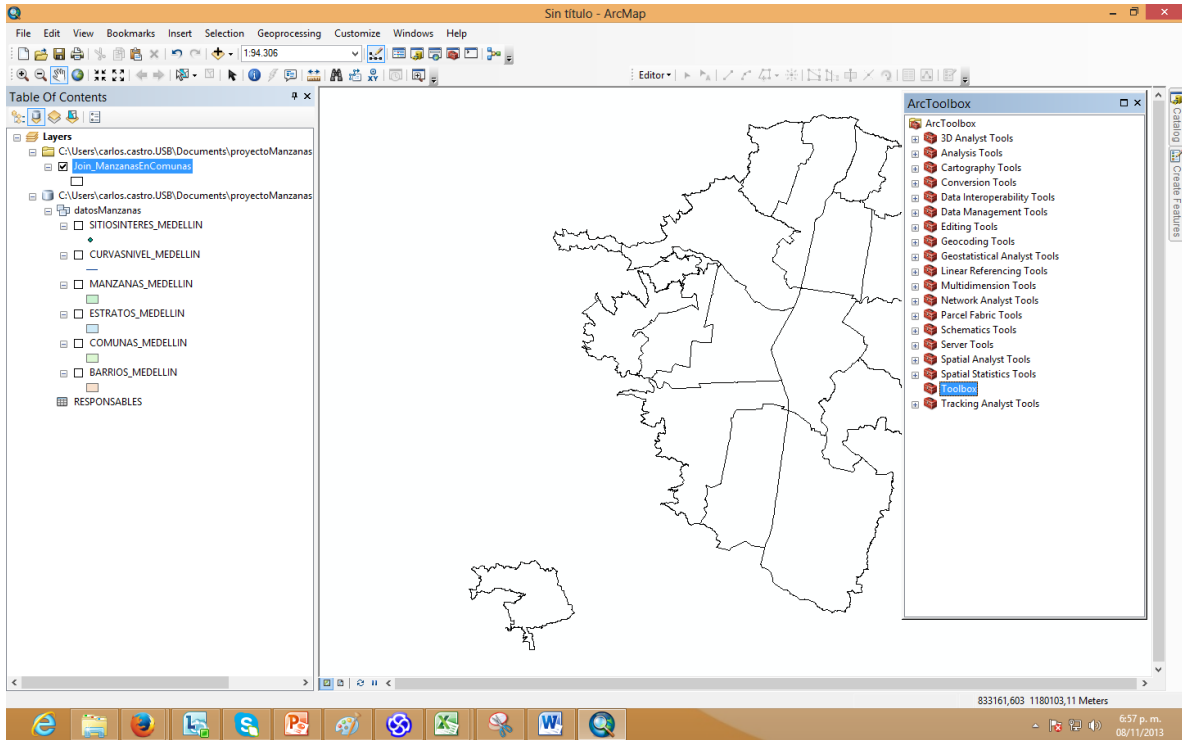
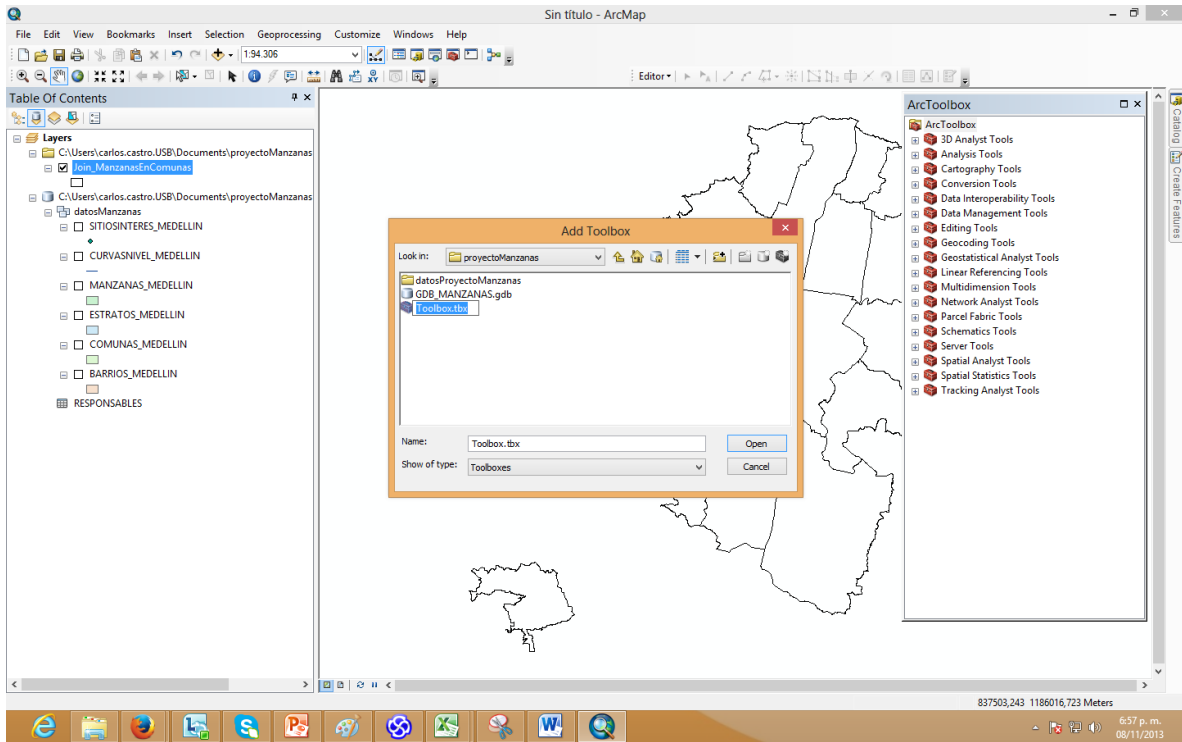


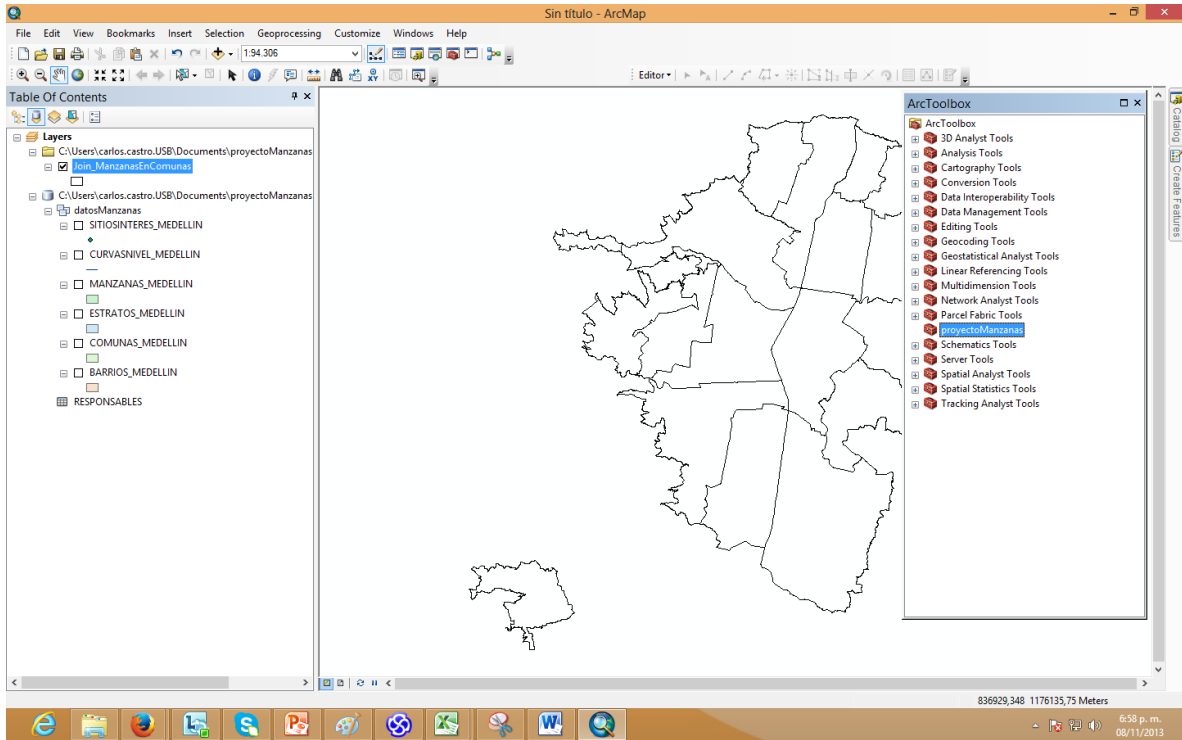
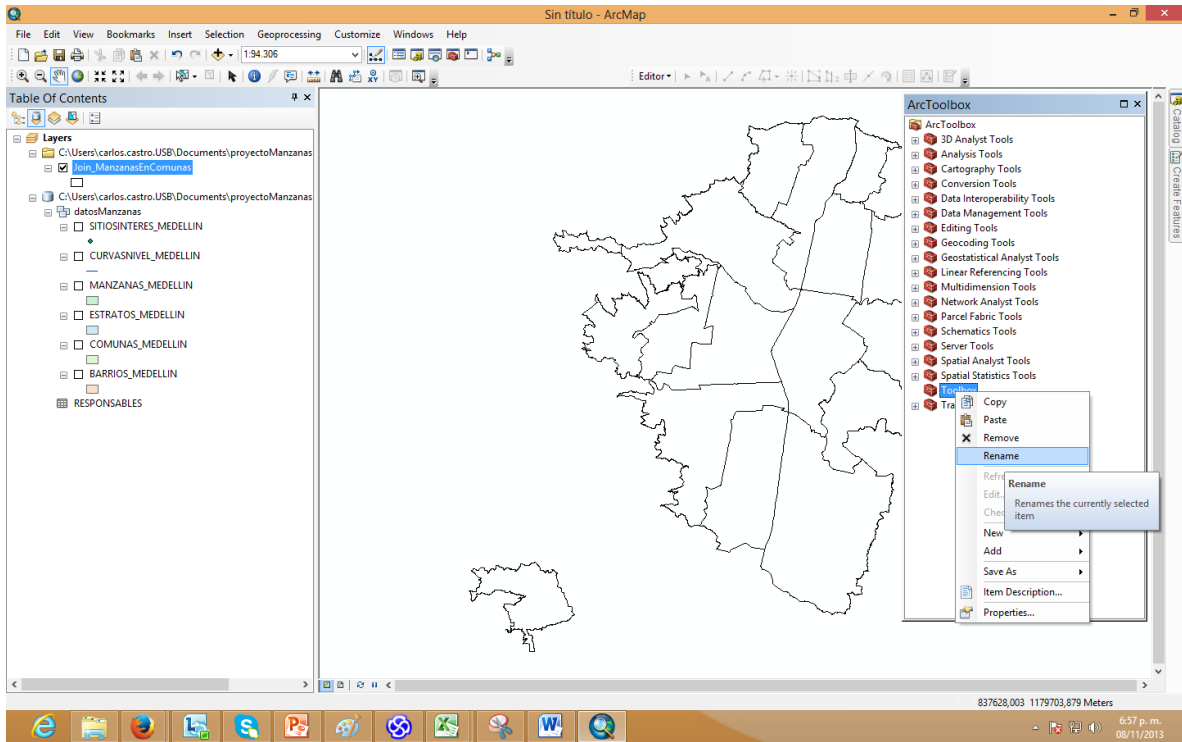
### CREAR UN NUEVO TOOLBOX

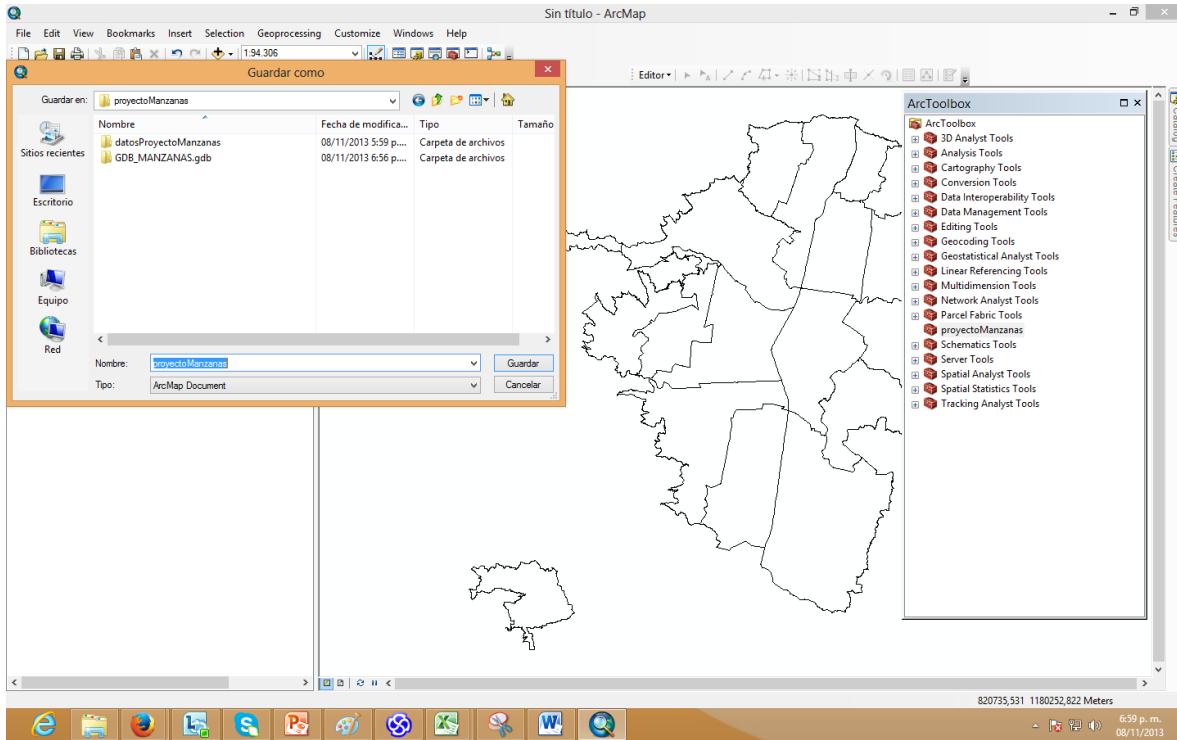
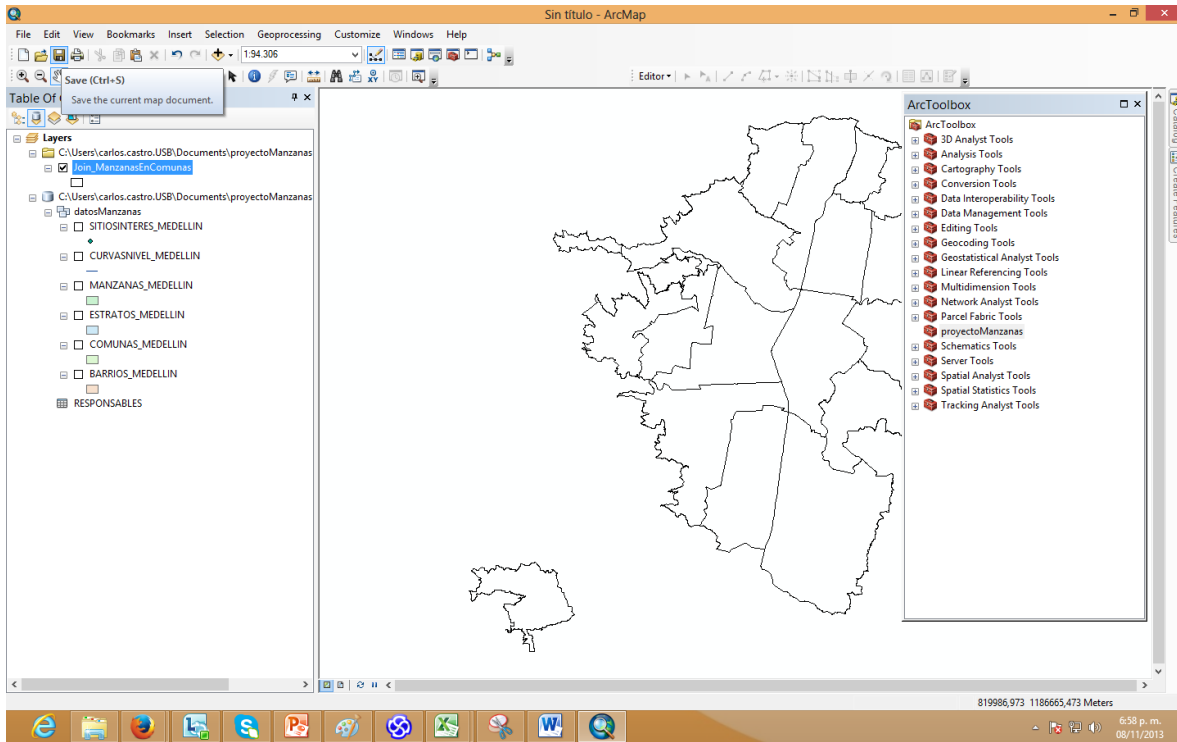


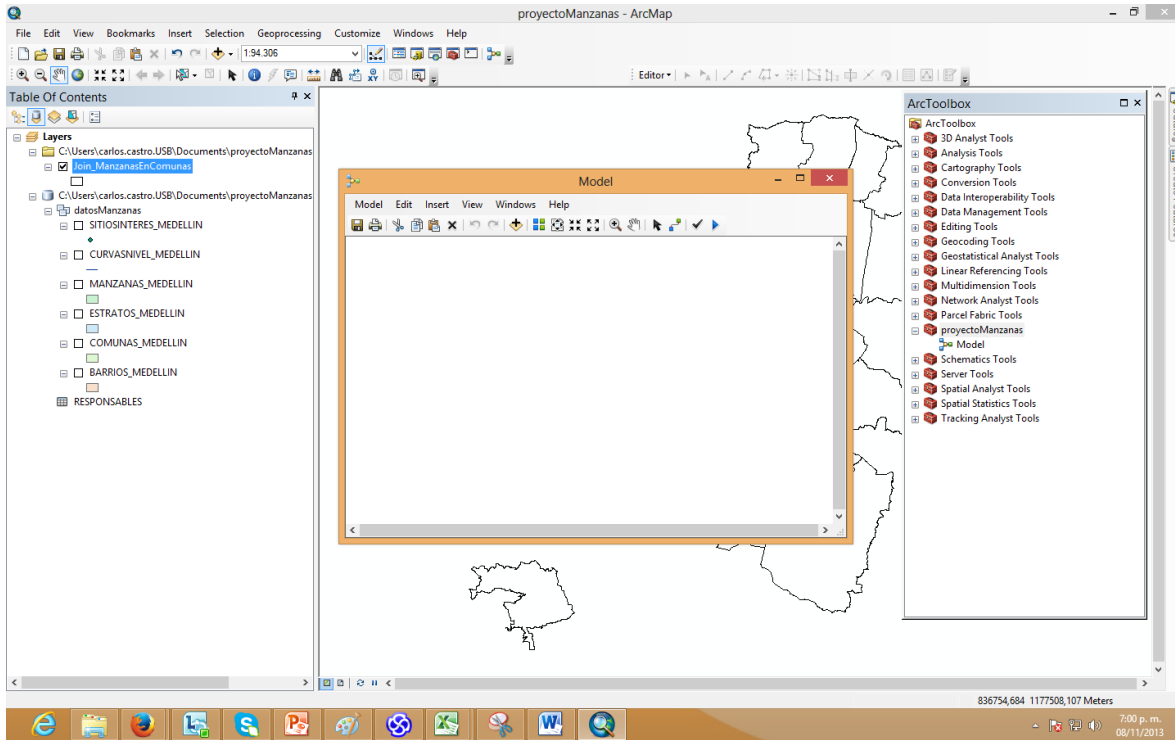
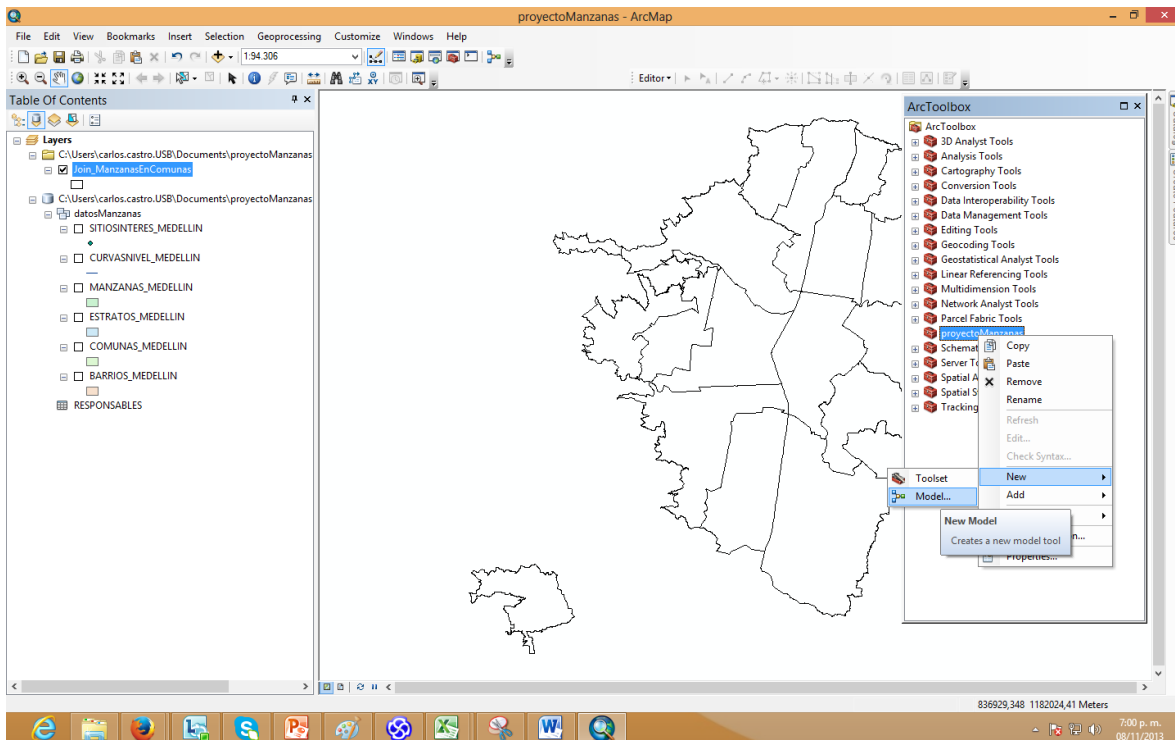






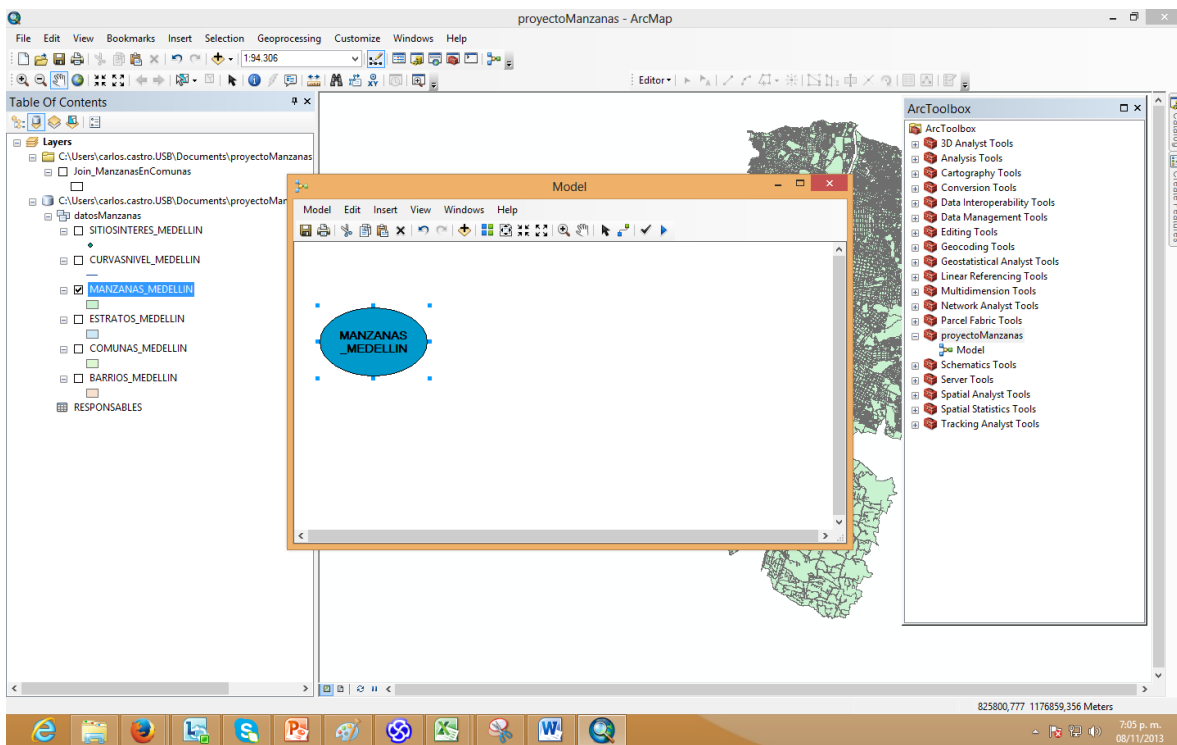
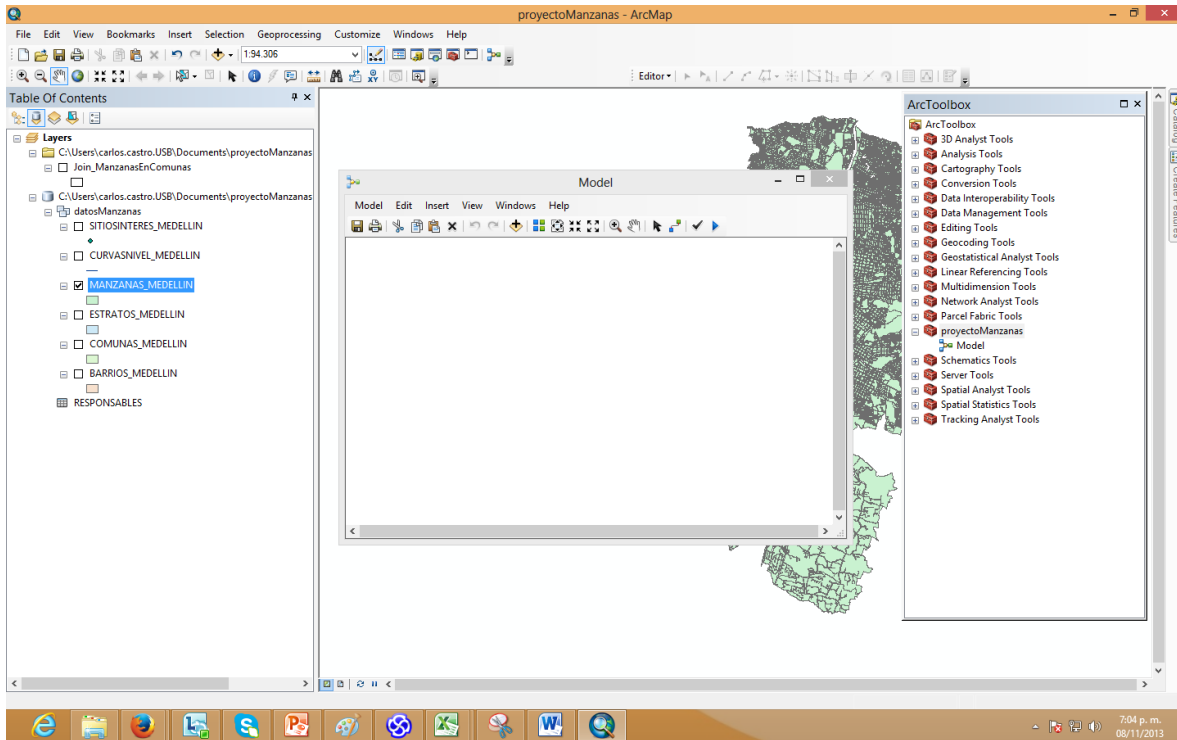




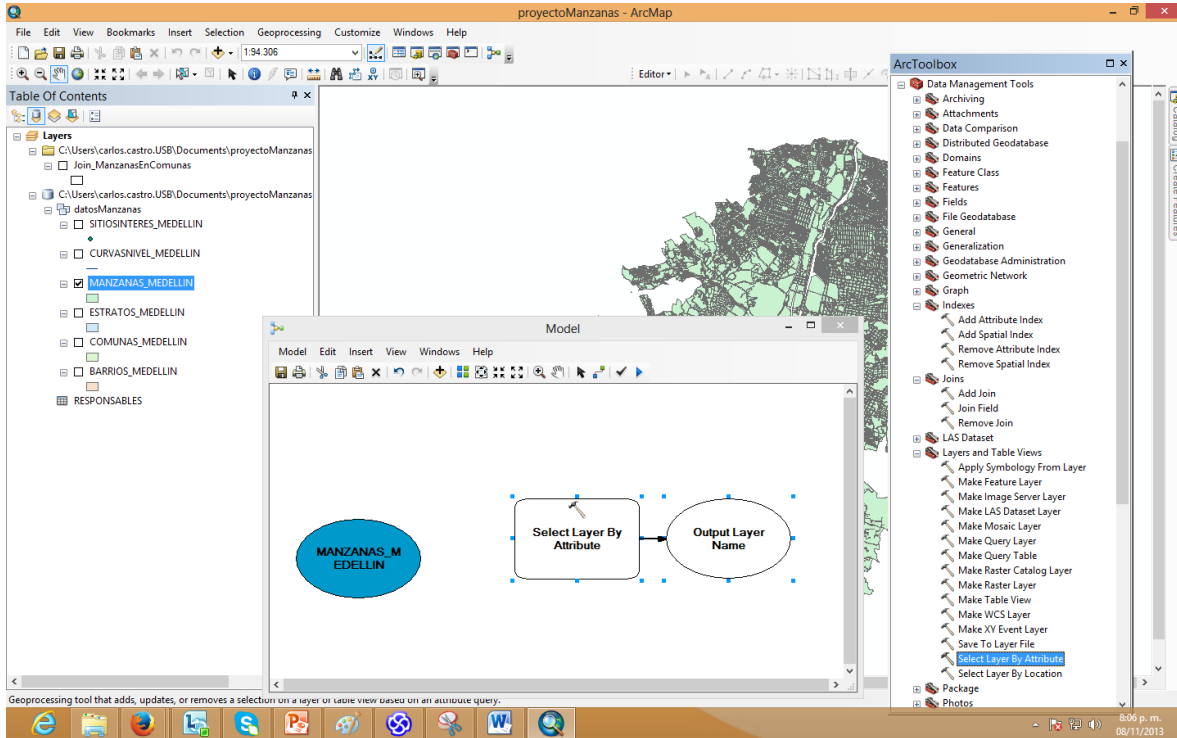


Mostrar las manzanas a las que no les han asignado responsable, que interceptan estratos 1, 2 ó 3 y que se encuentran a una altura entre 1650 y 1750 metros

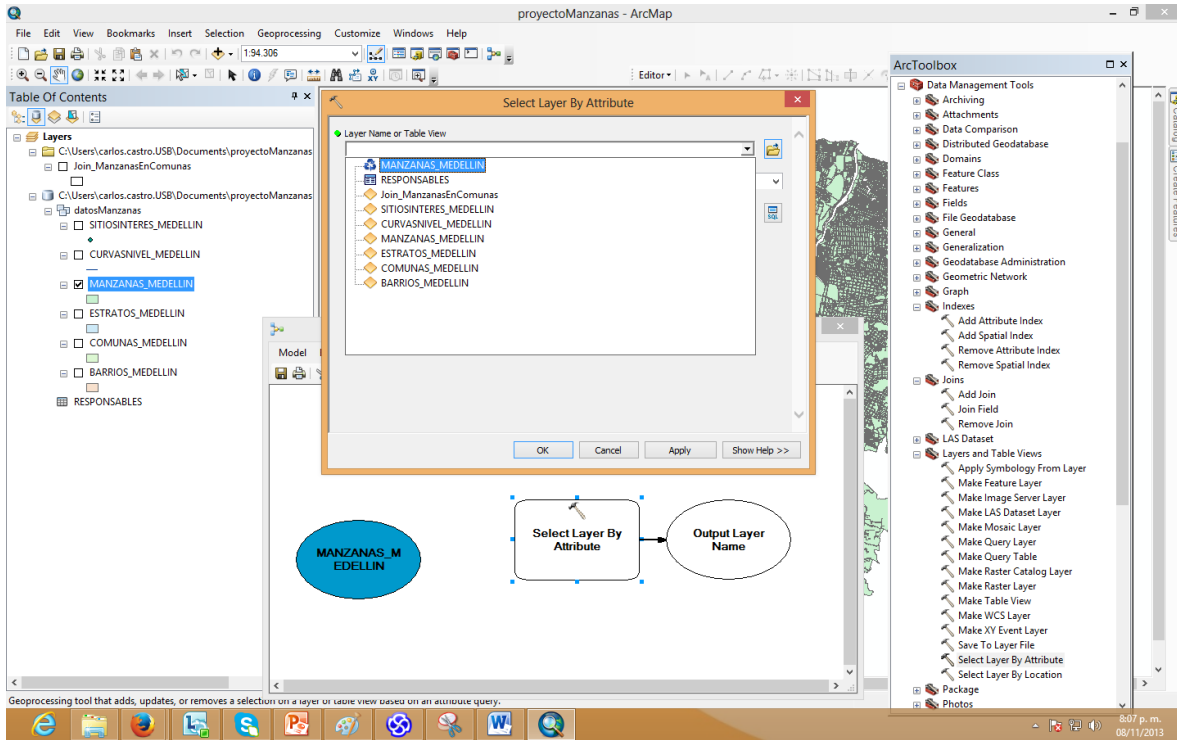
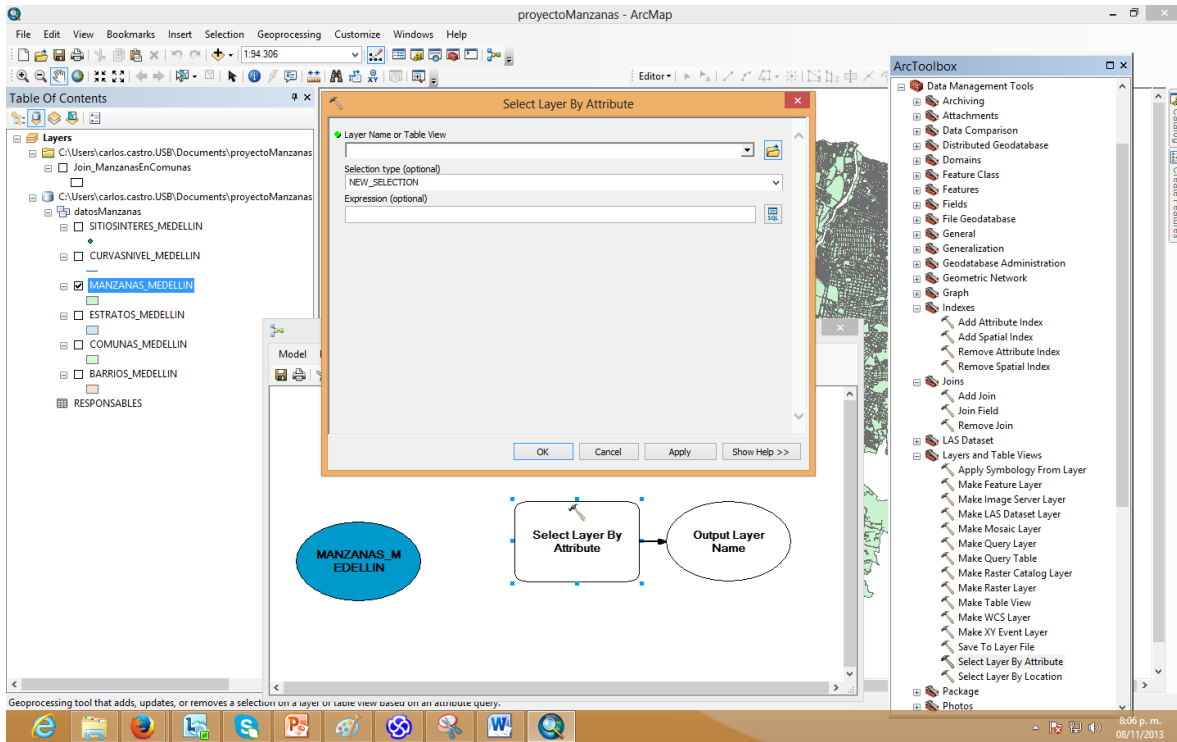
### ARRASTRAR Y SOLTAR MANZANAS\_MEDELLIN AL MODELO



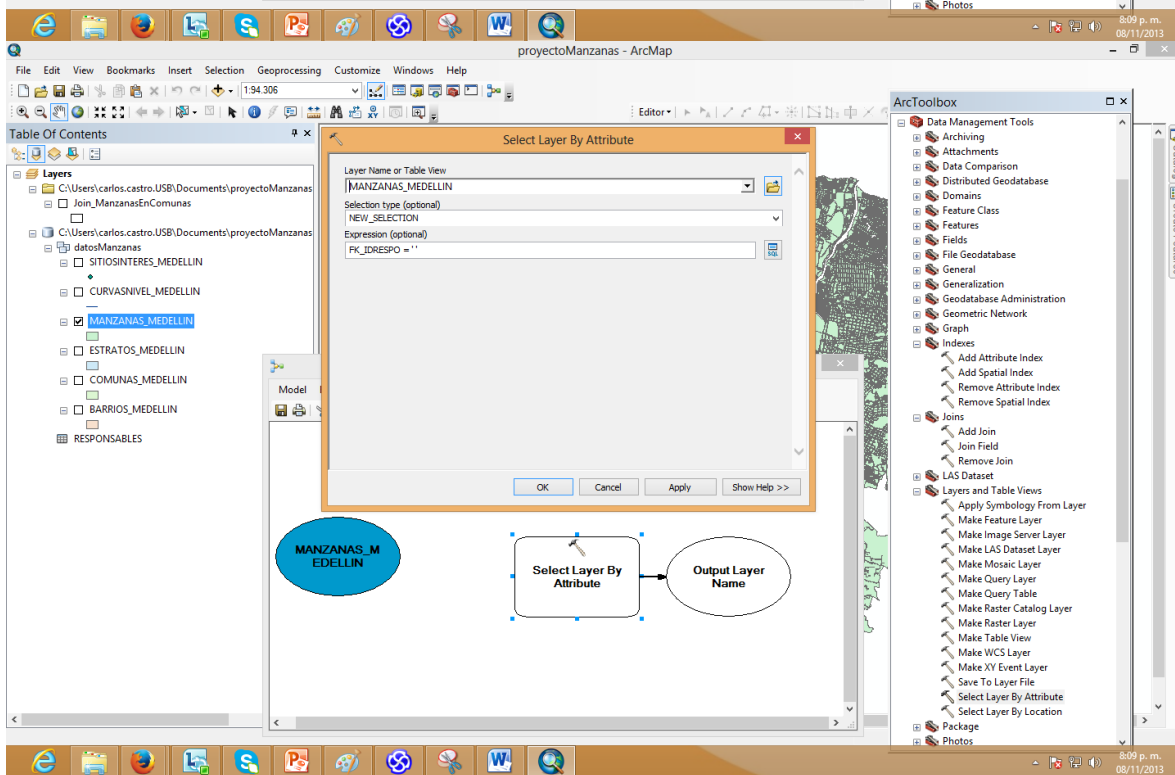
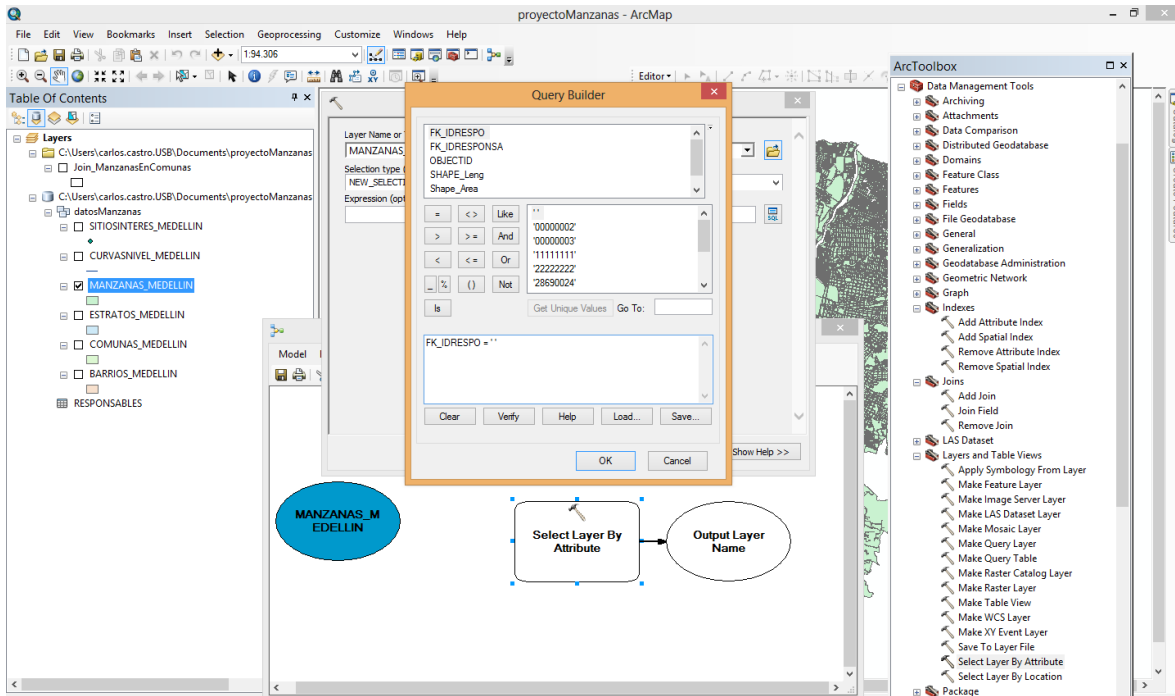
ARRASTRAR Y SOLTAR Select Layer By Attribute sobre el modelo (está en Data Management Tools->Layers and Tables Views

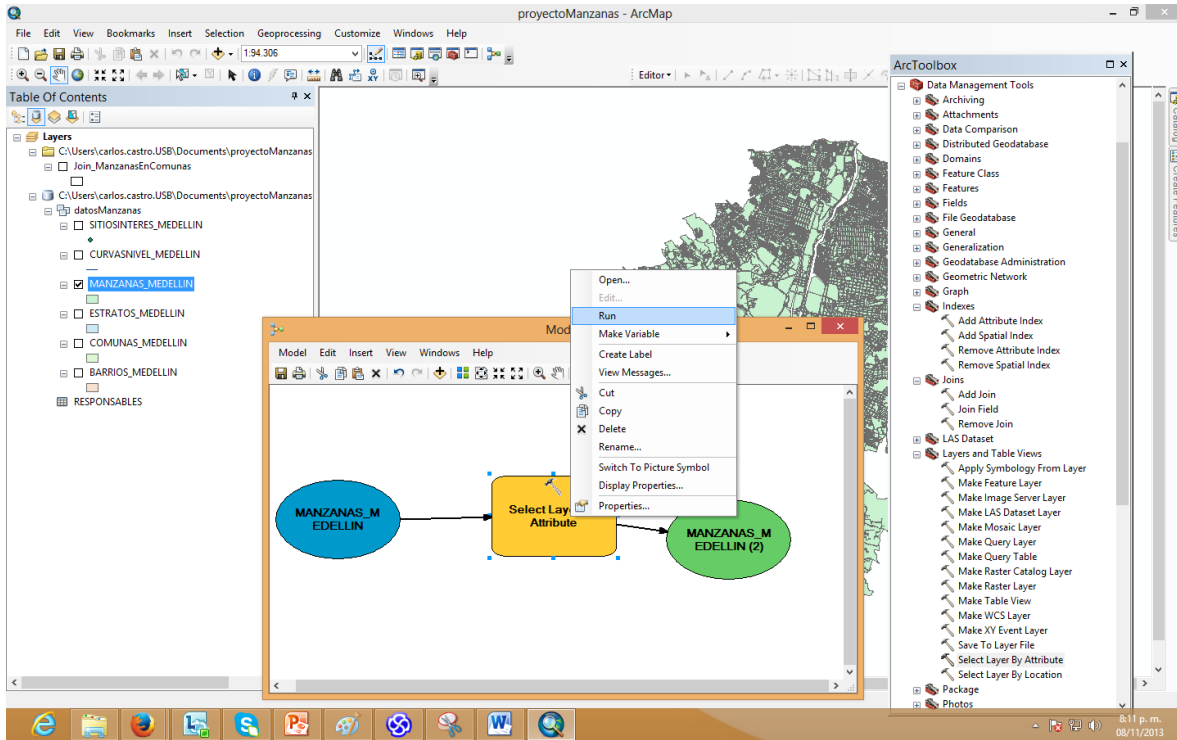
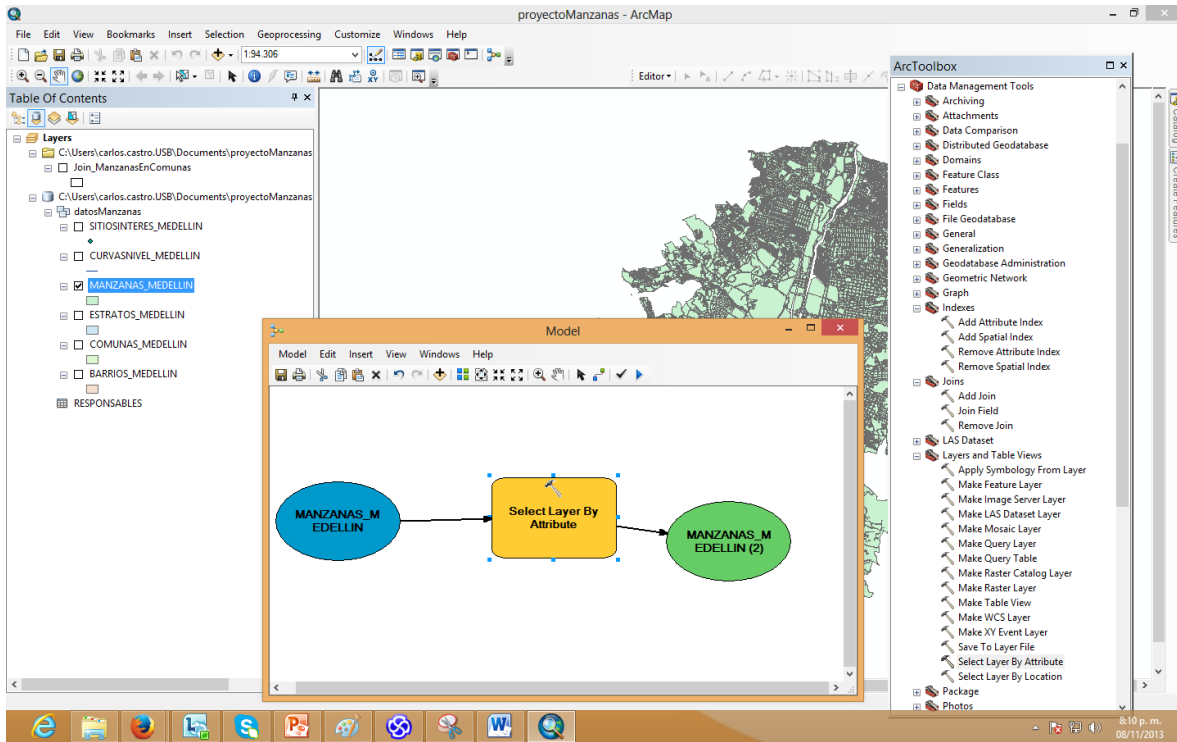


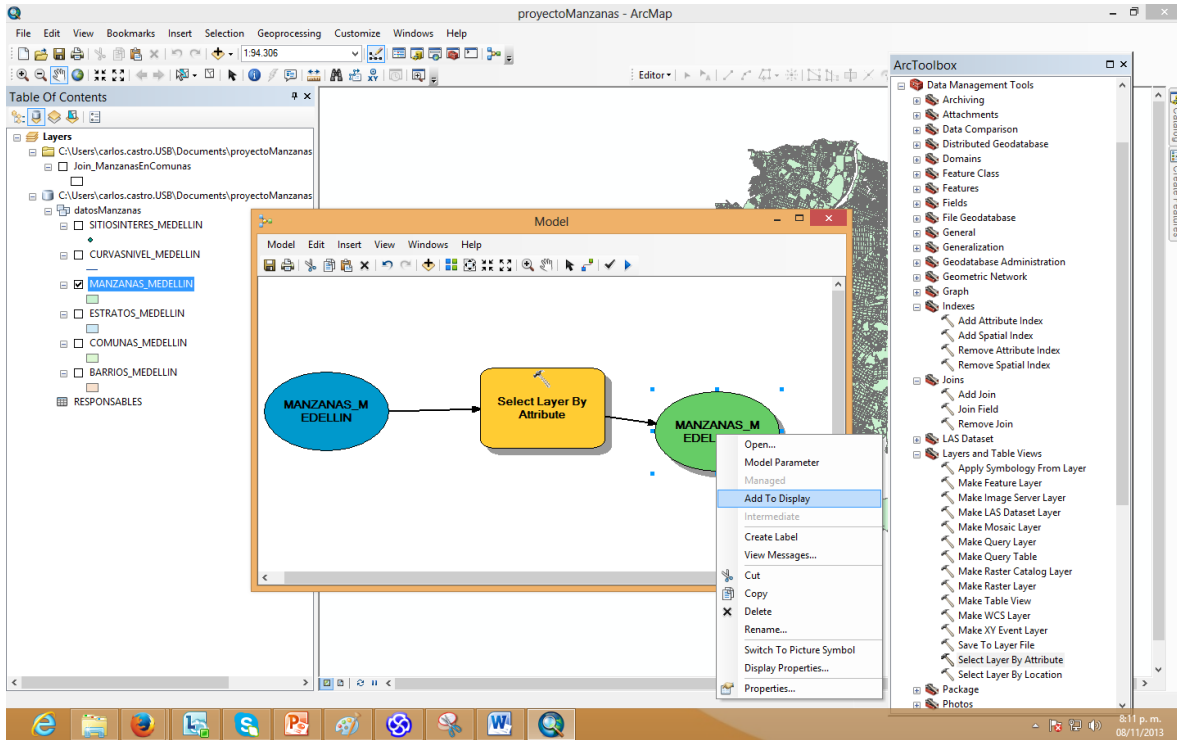
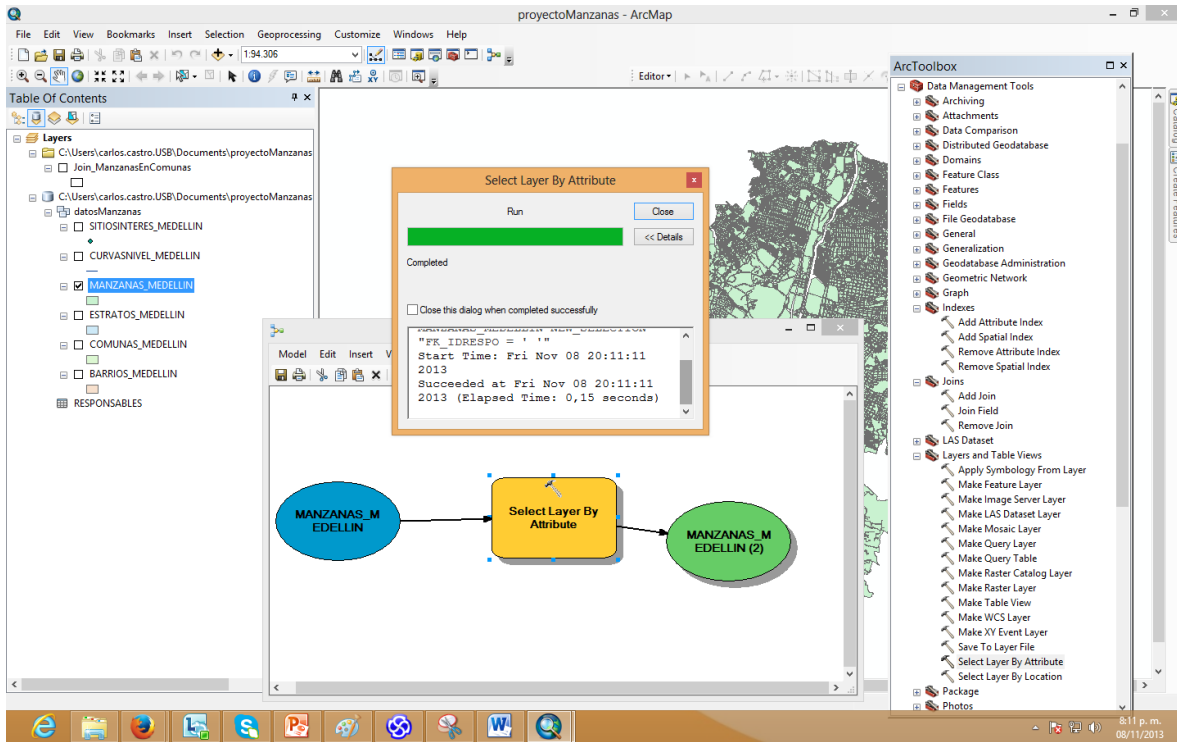
Doble Clic sobre el Rectángulo Select Layer By Attribute

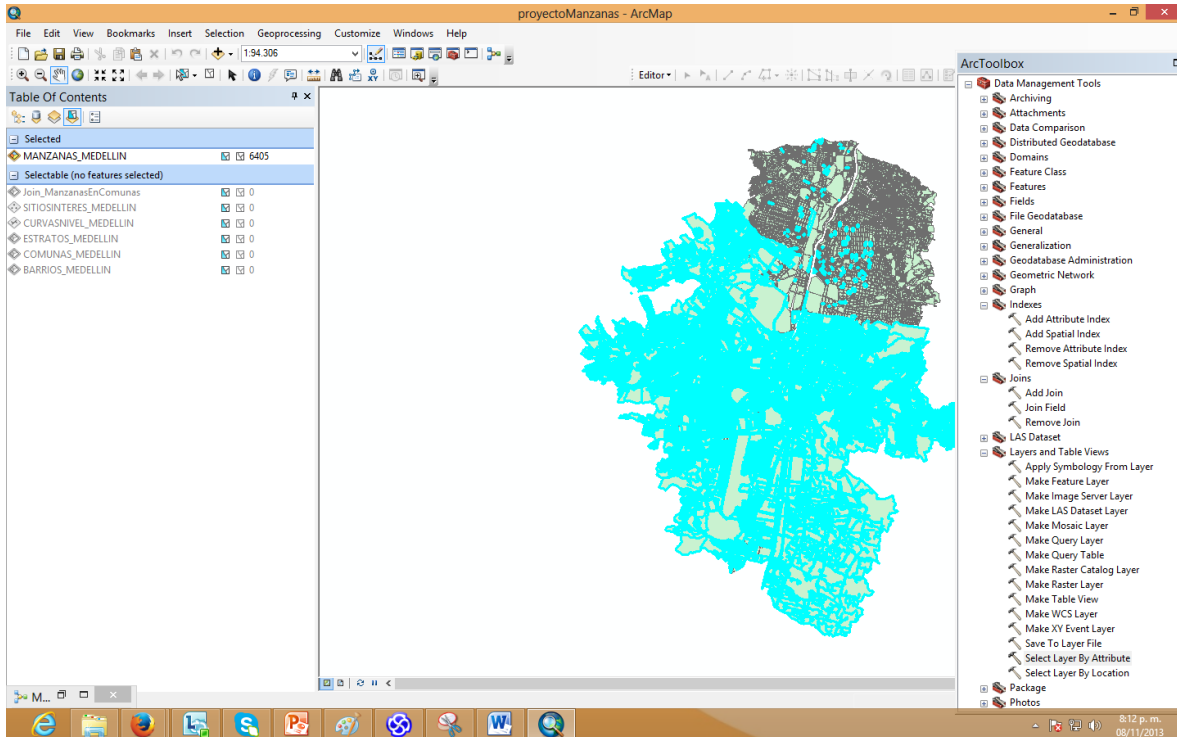
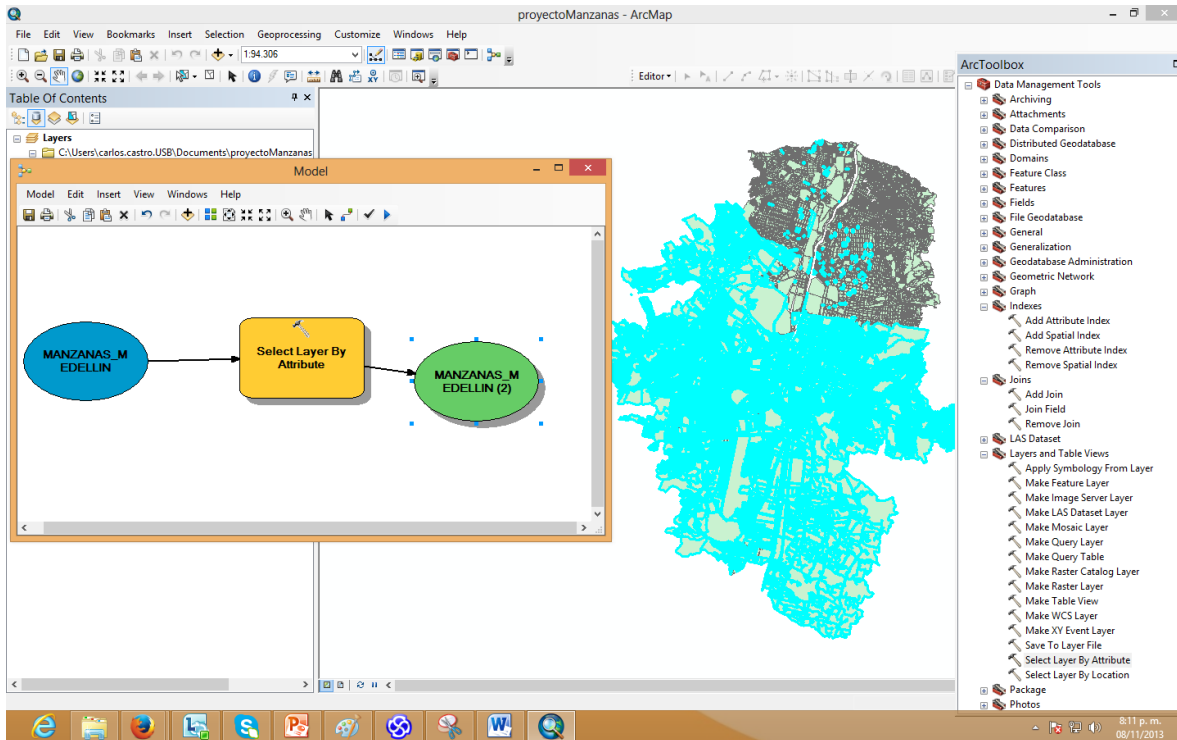


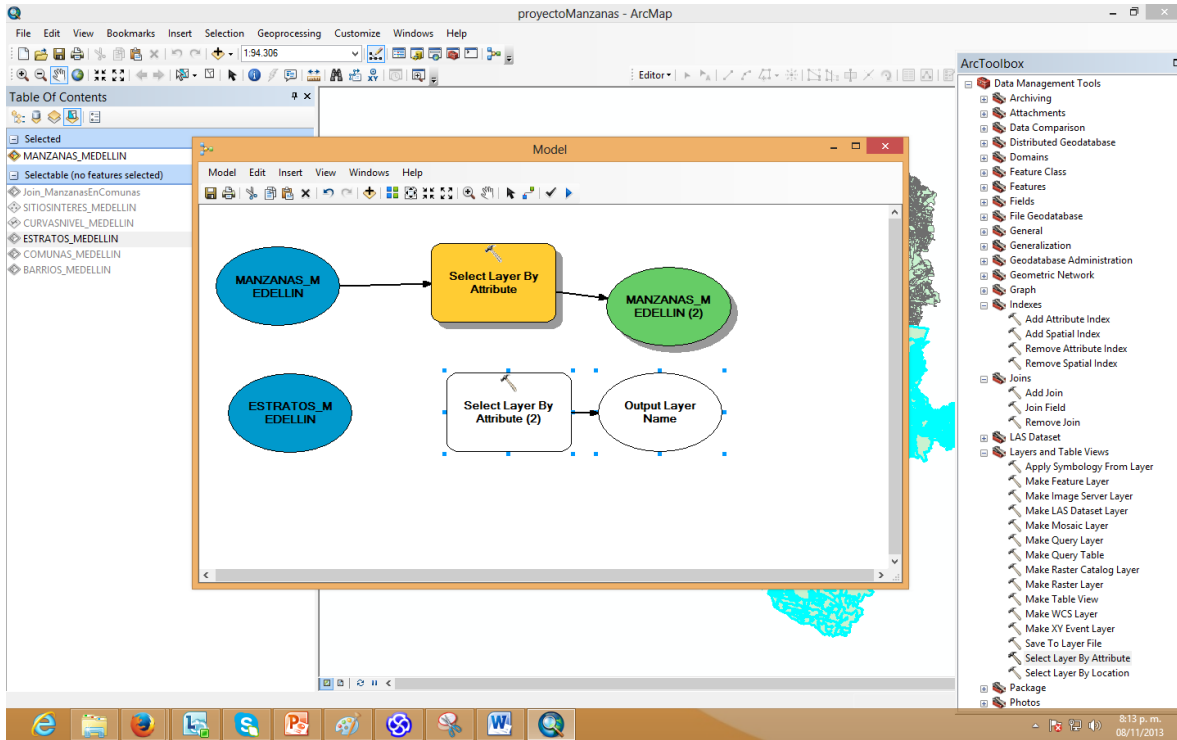
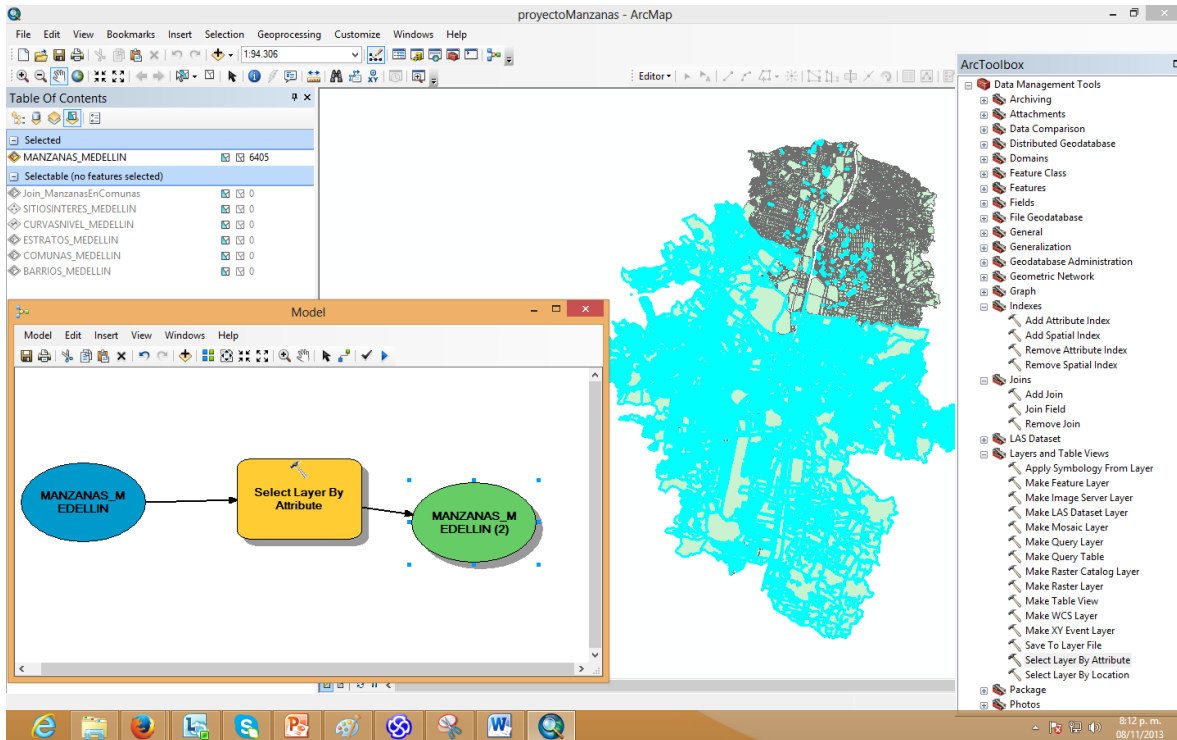


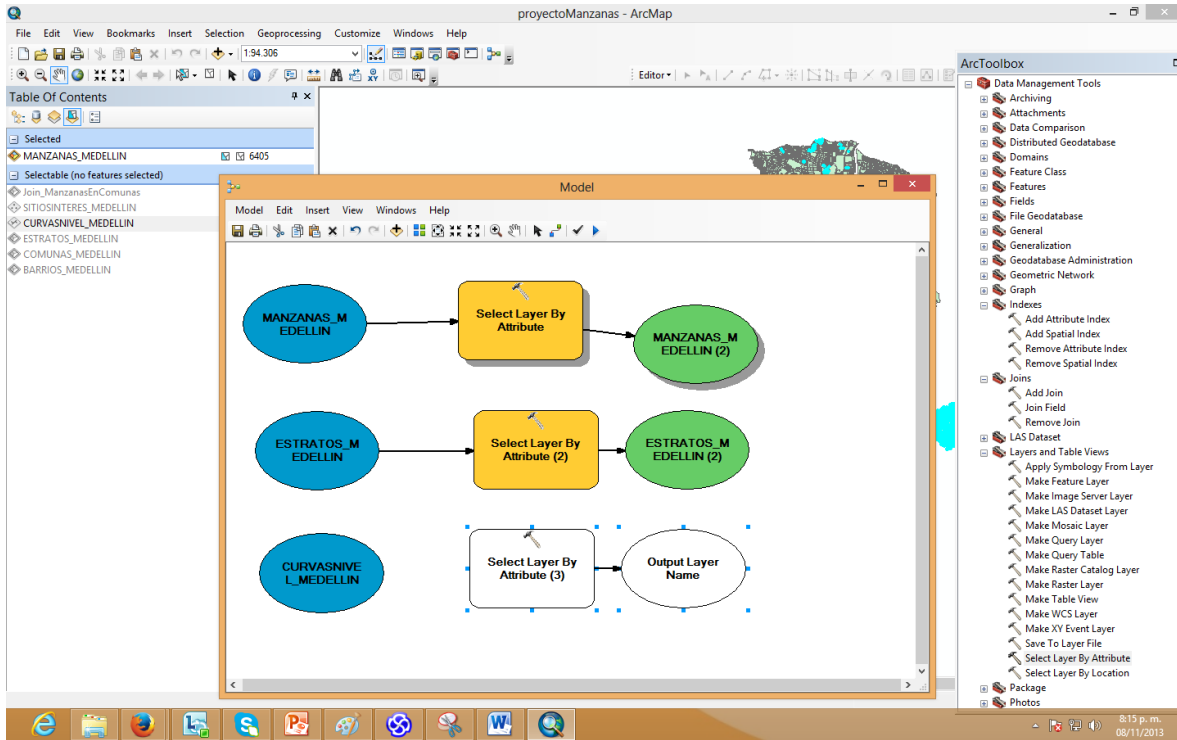
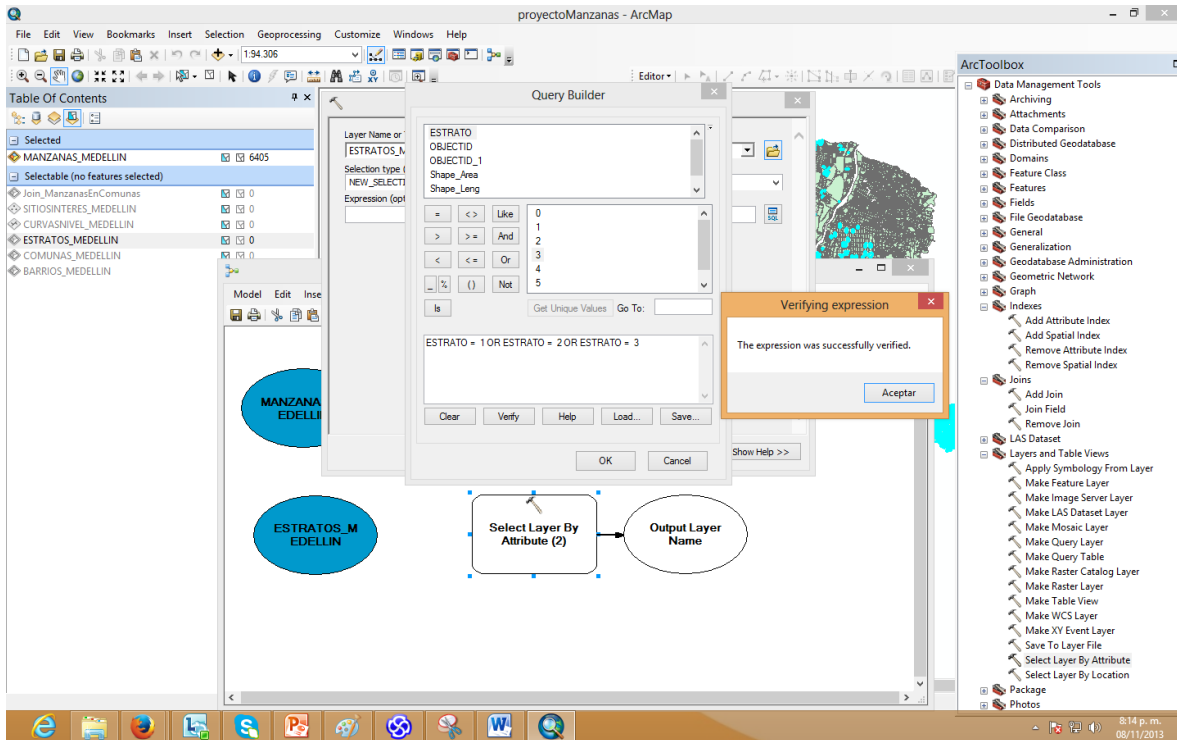


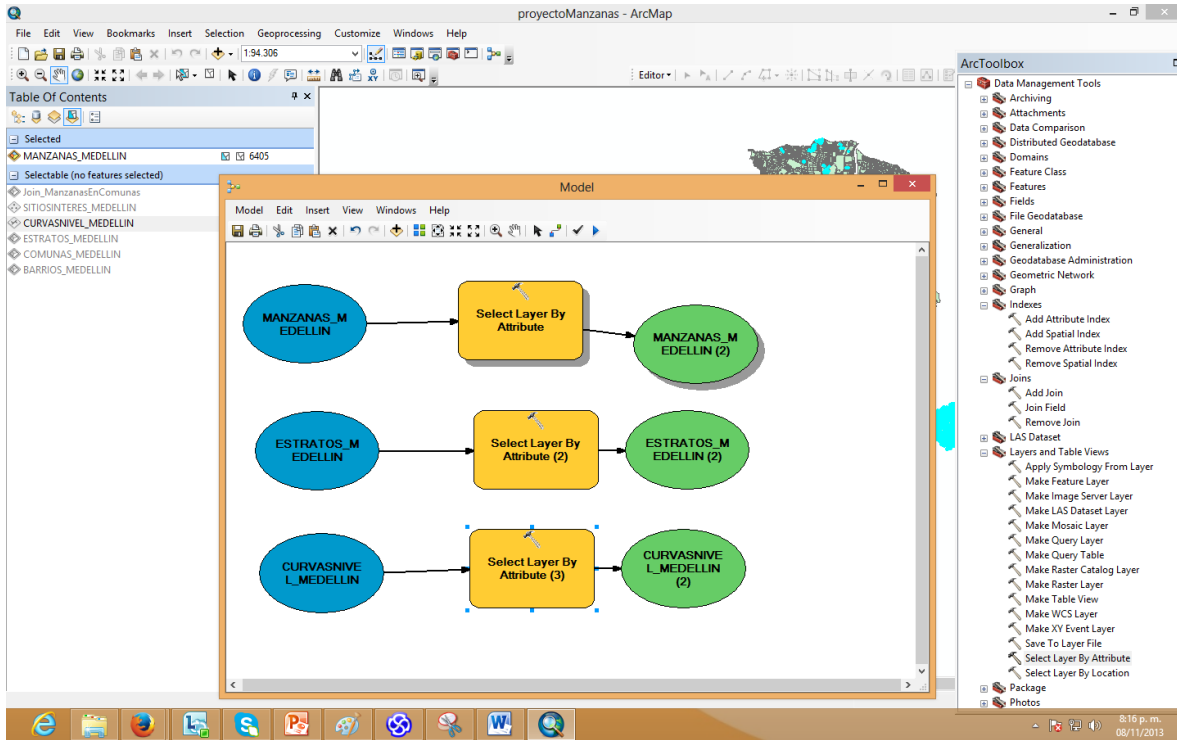
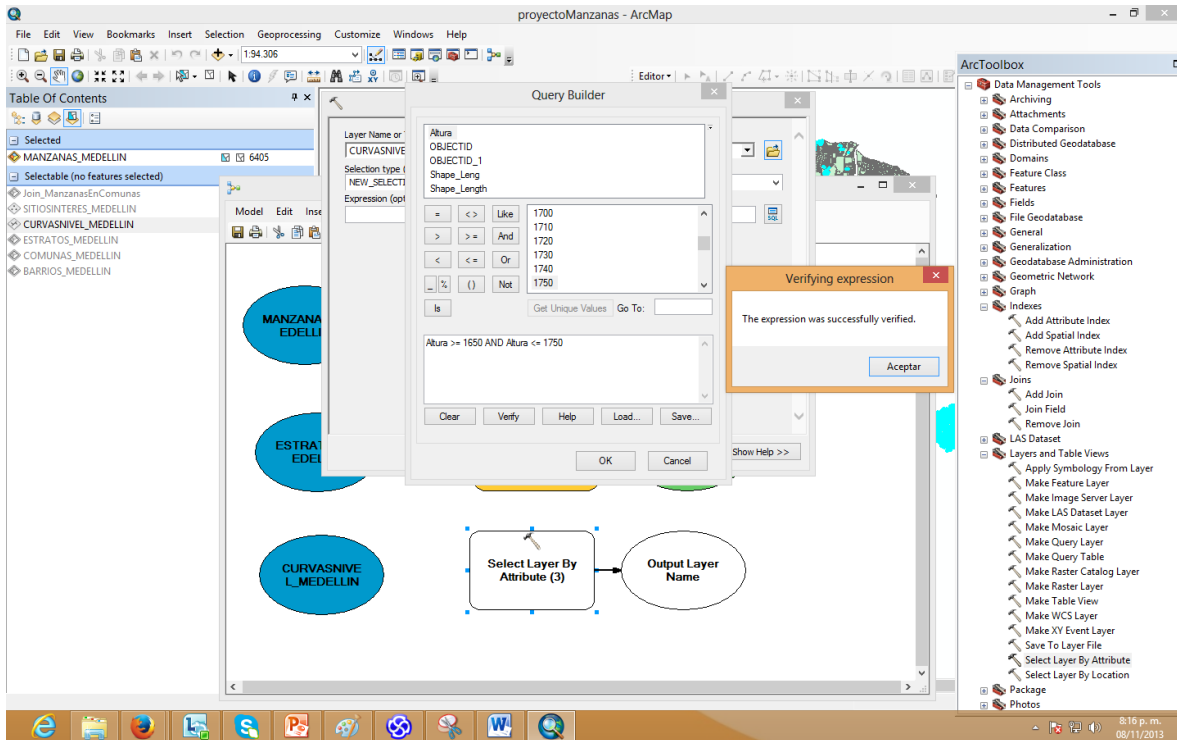


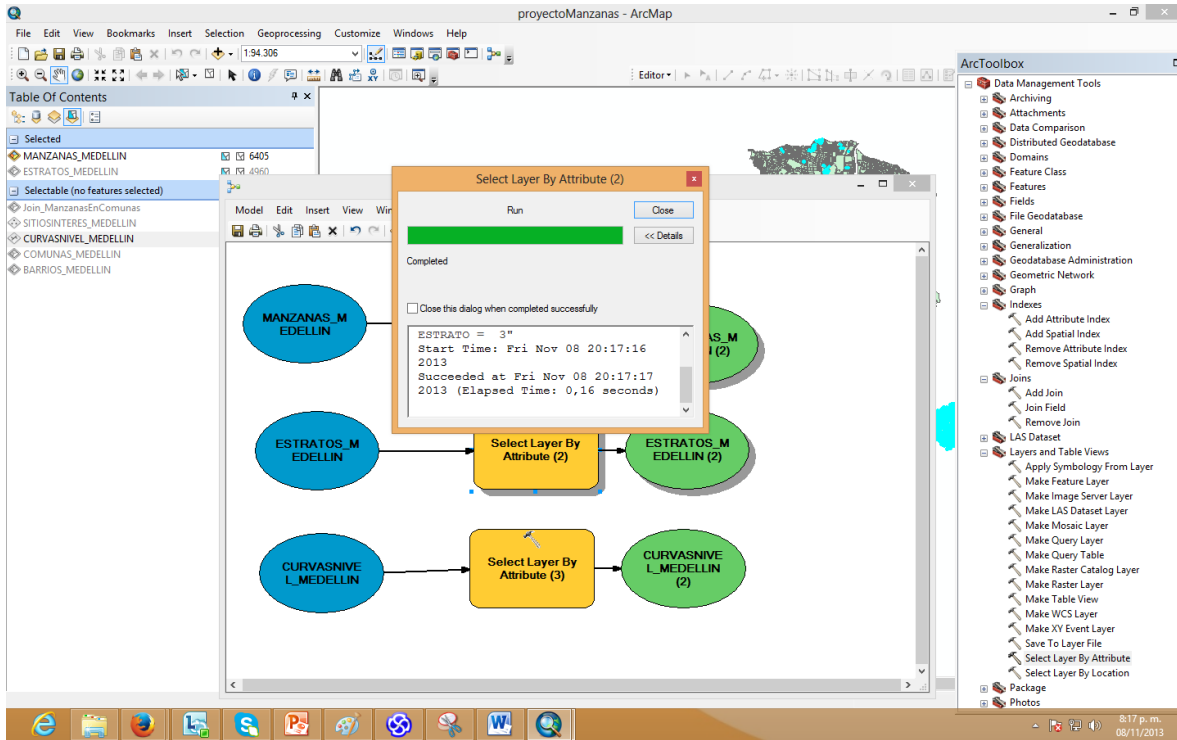
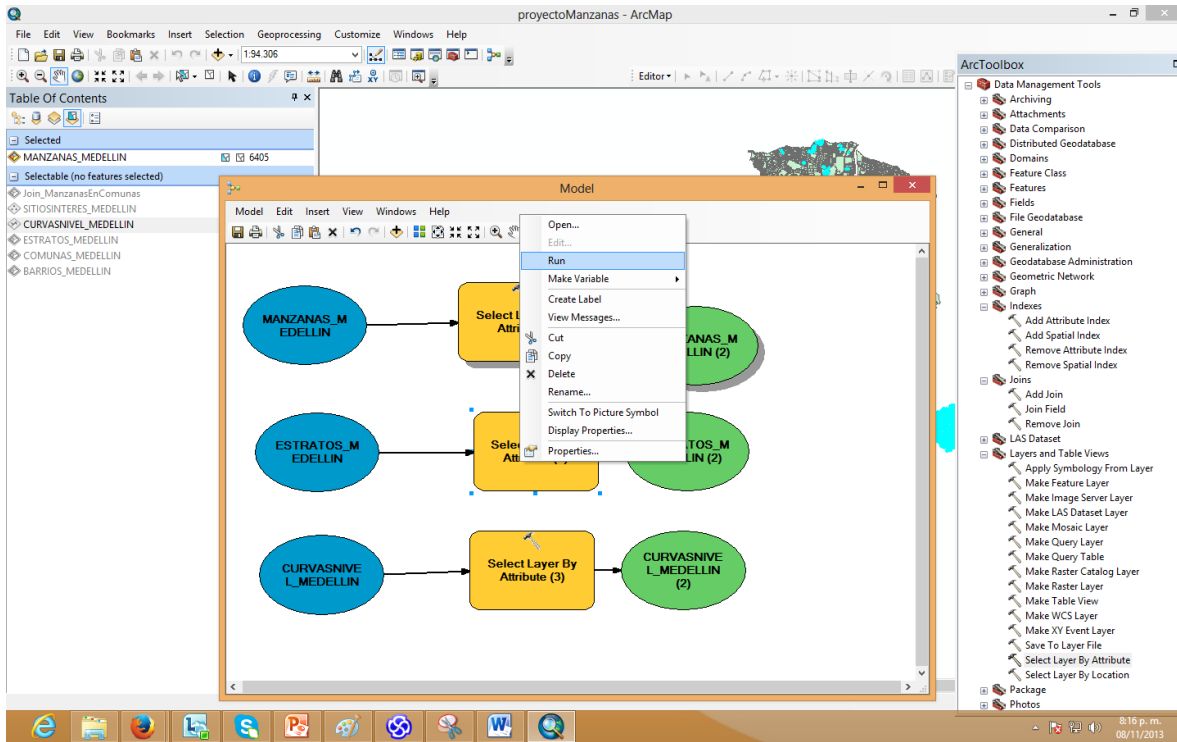




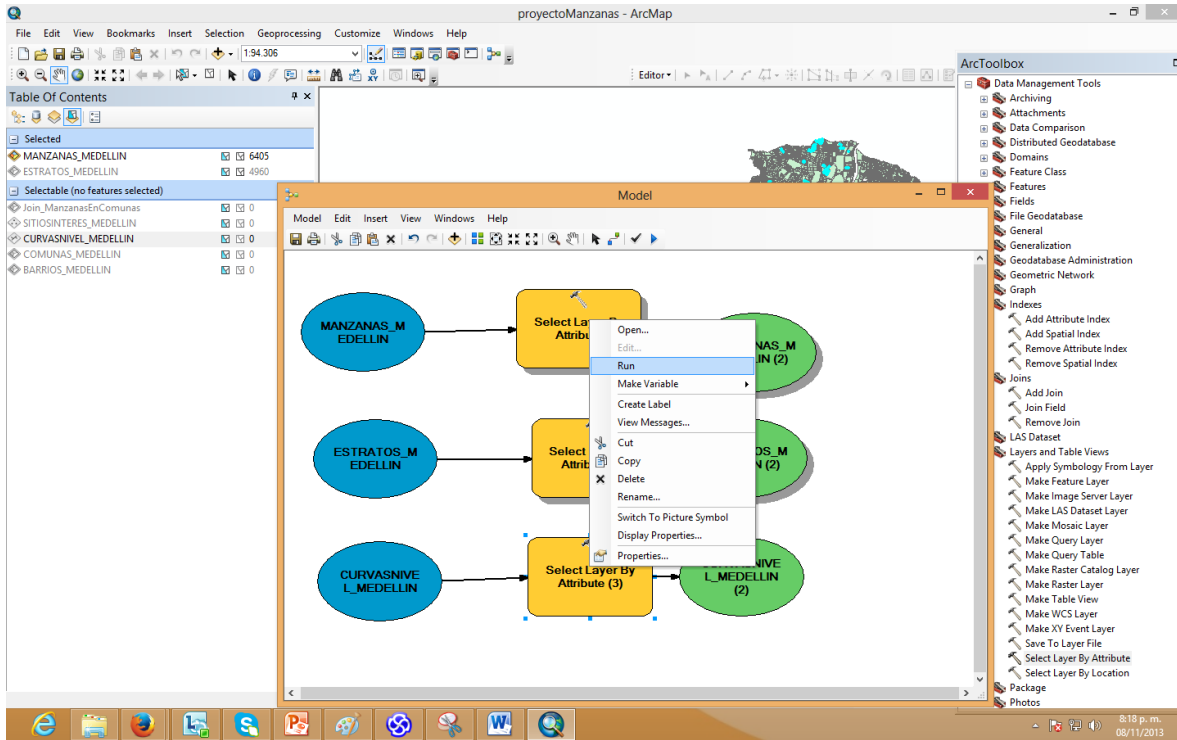
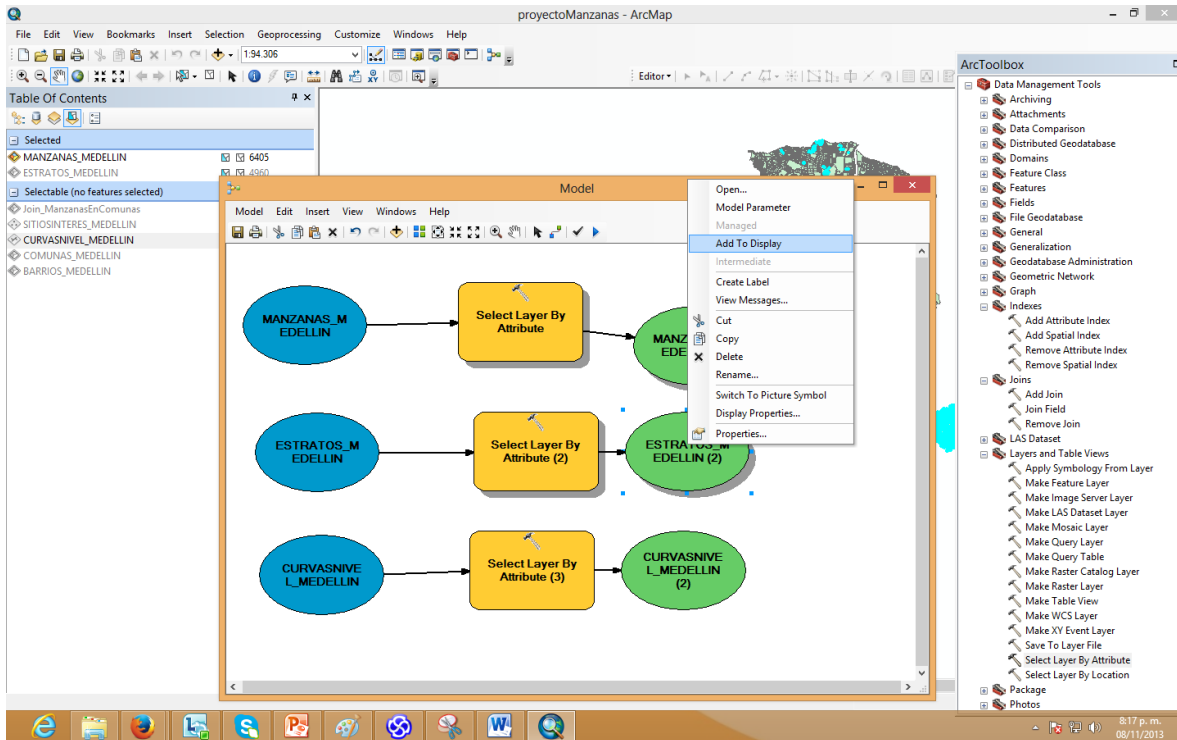


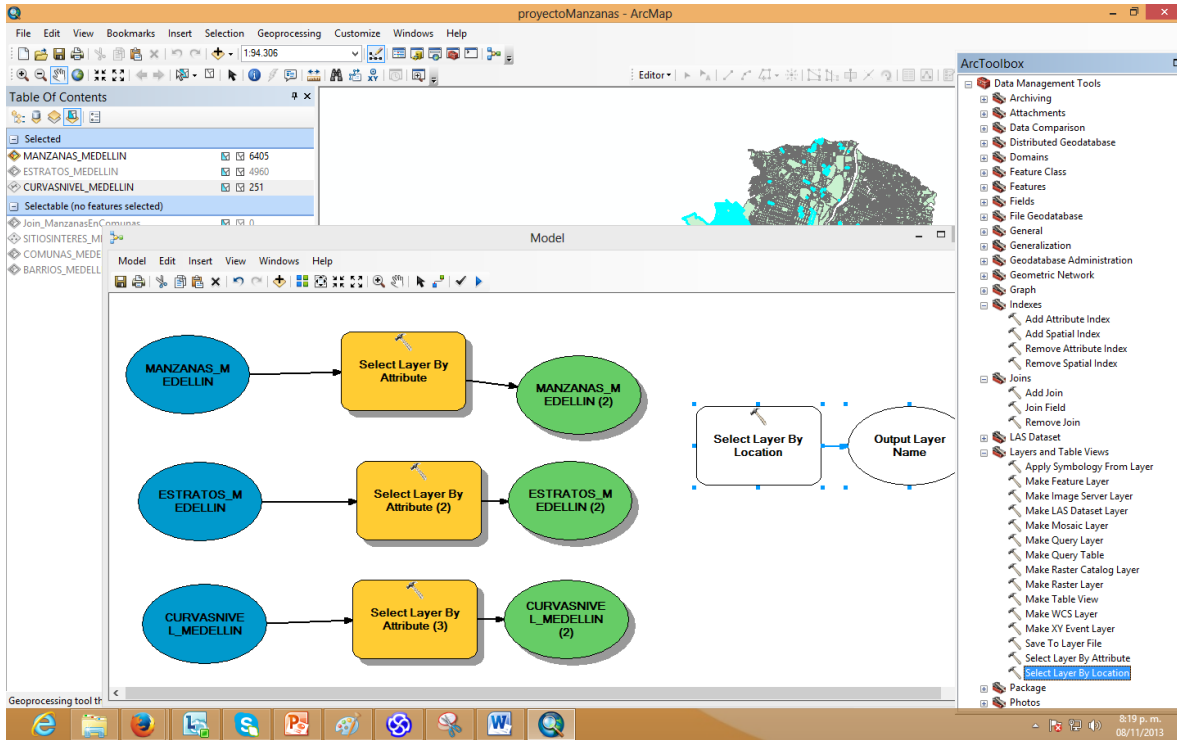
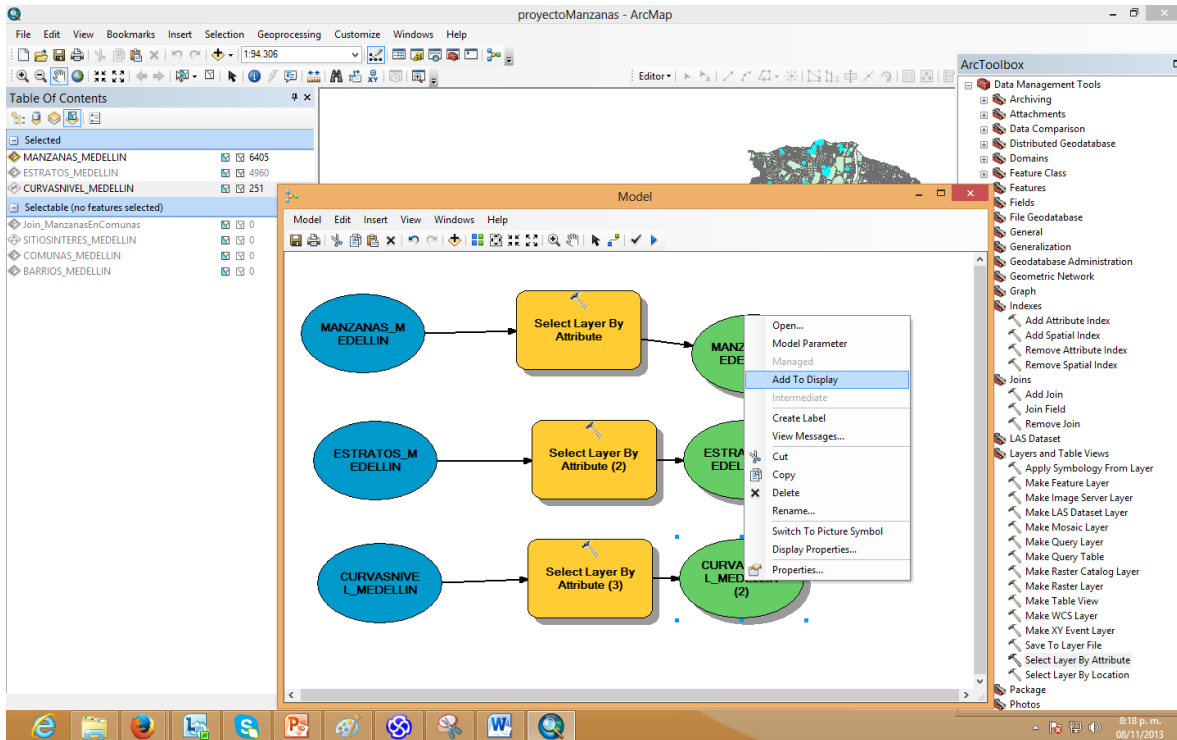


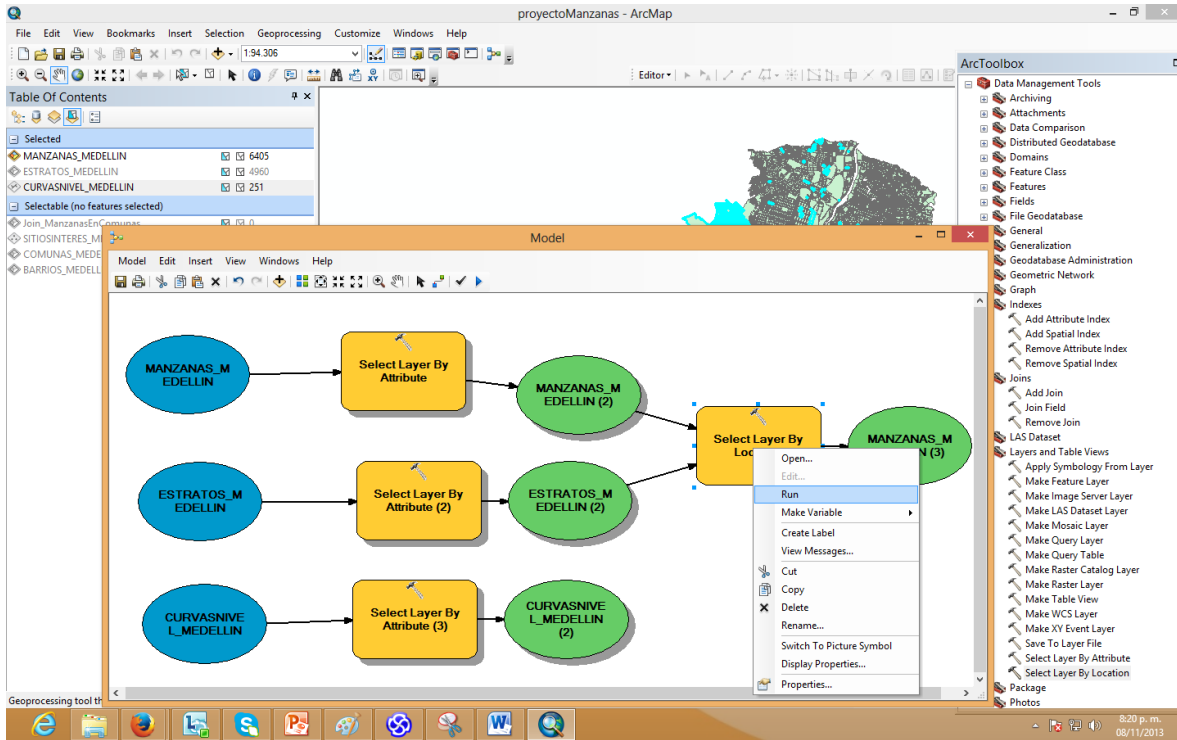
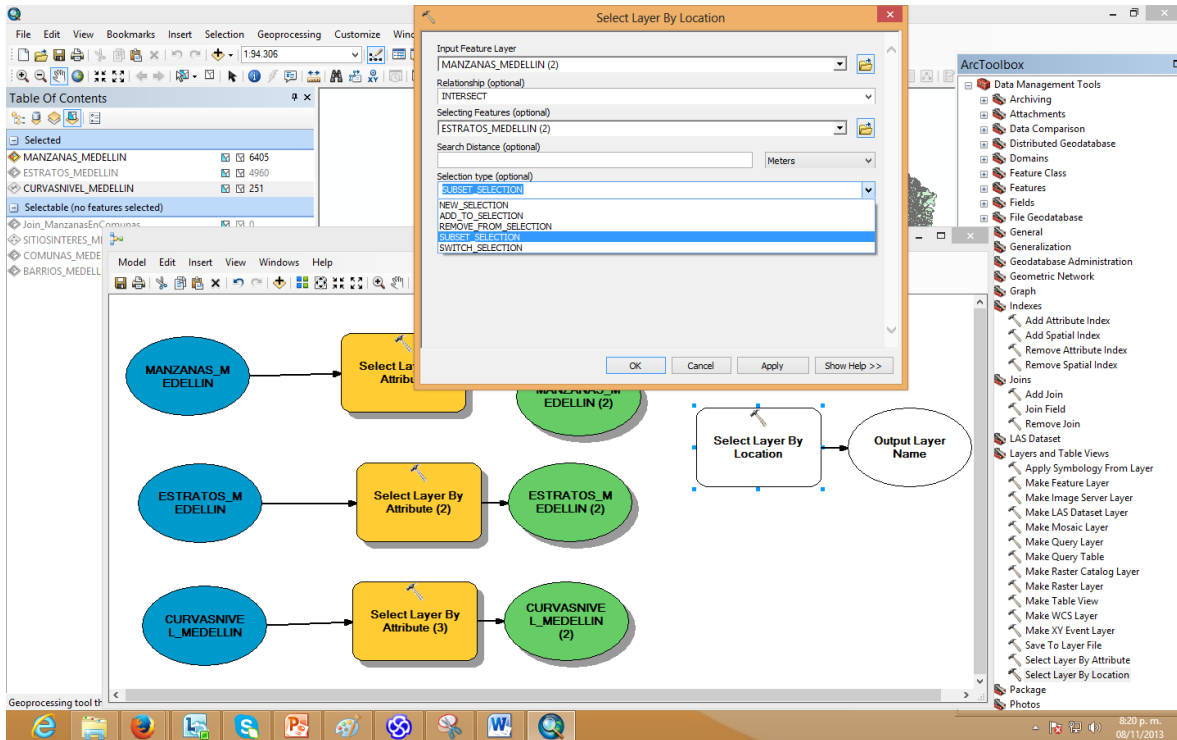


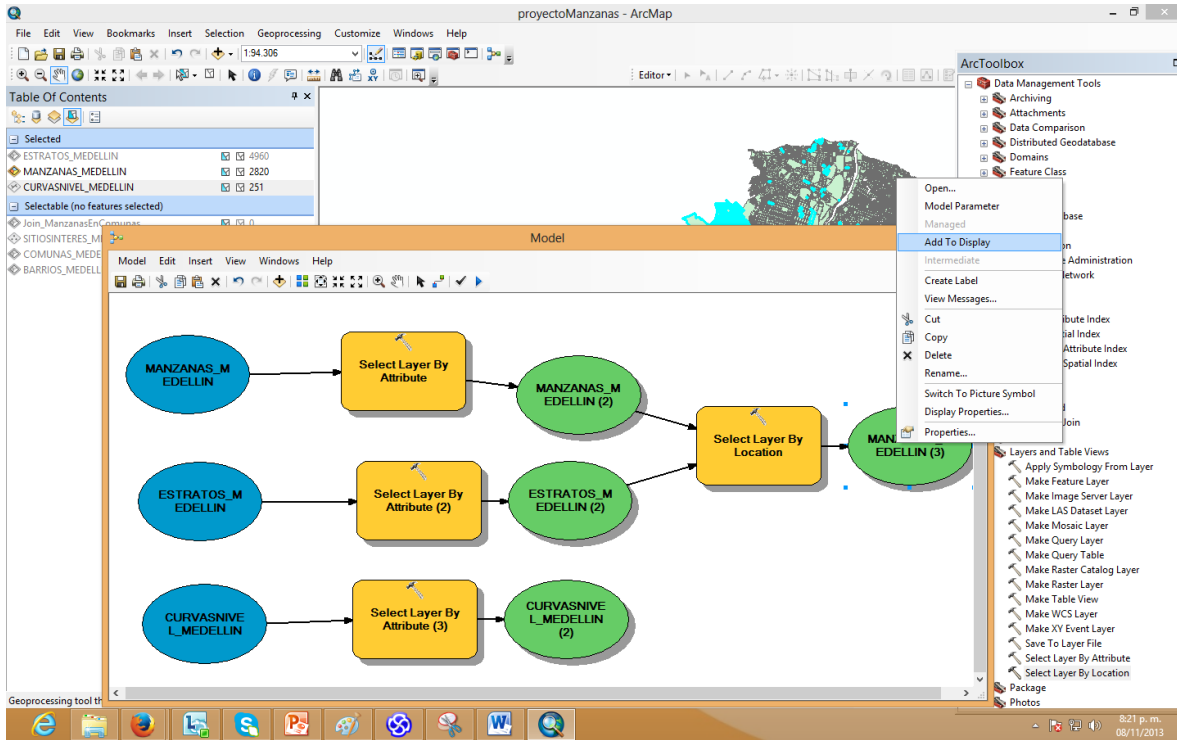
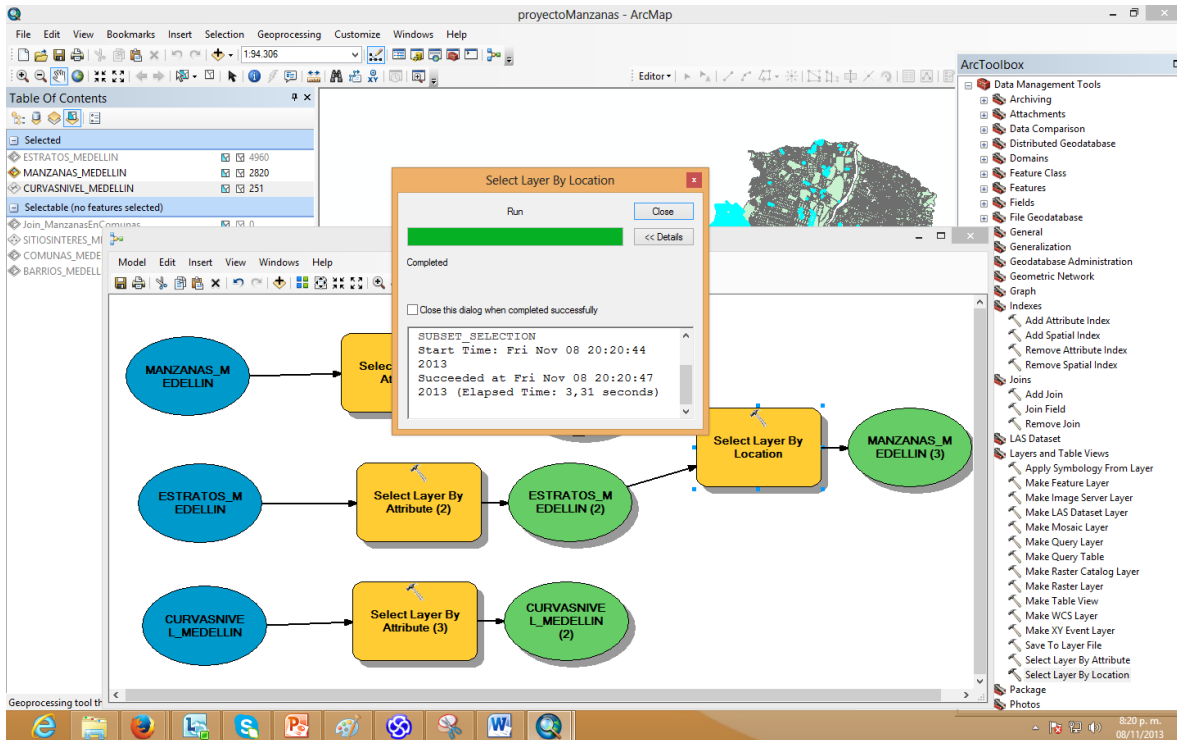


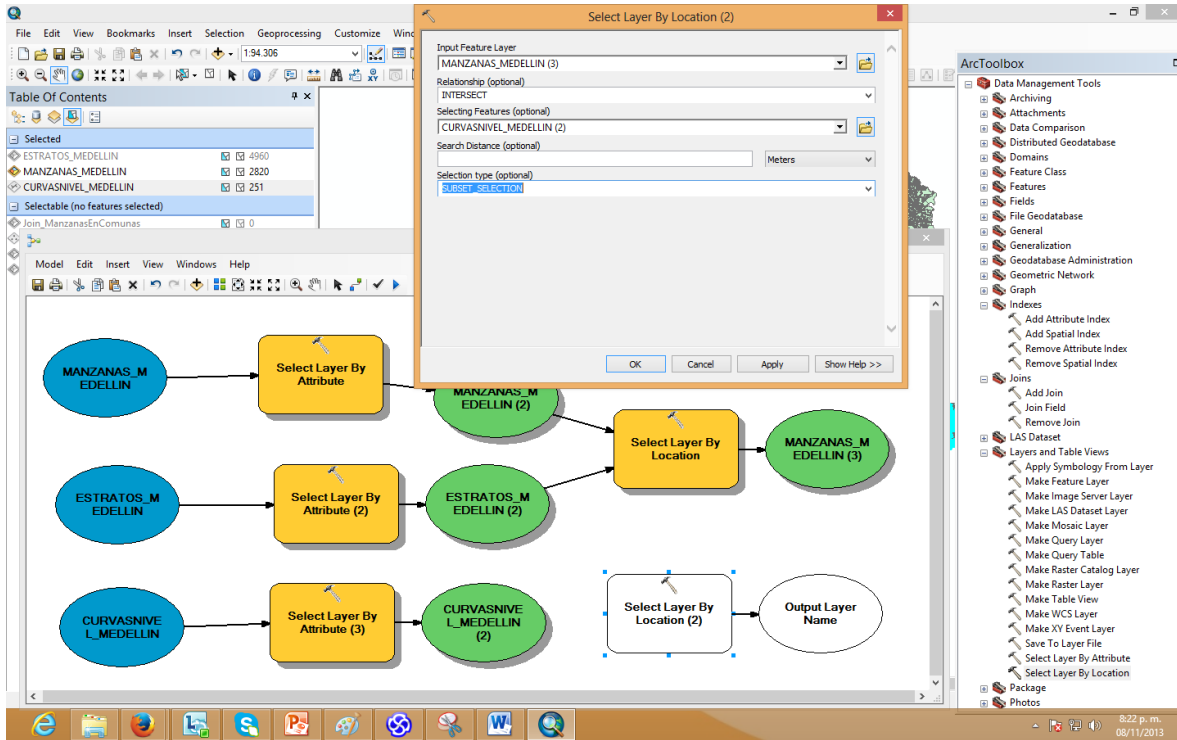
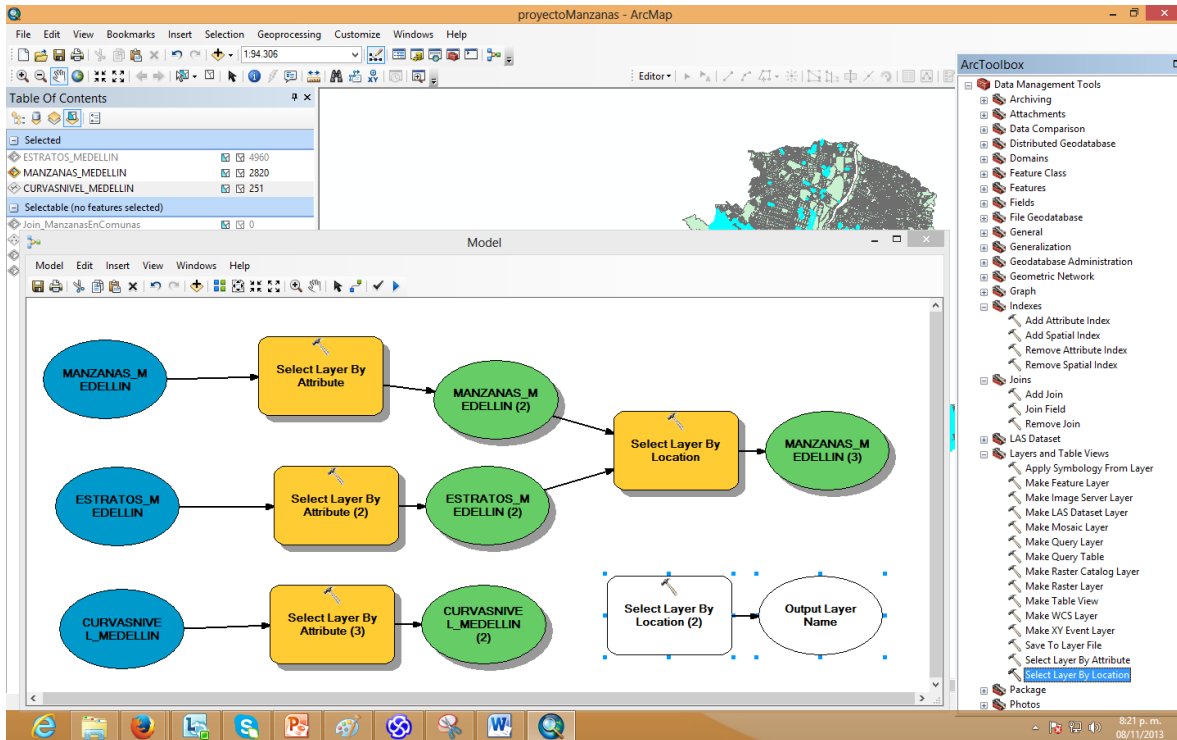


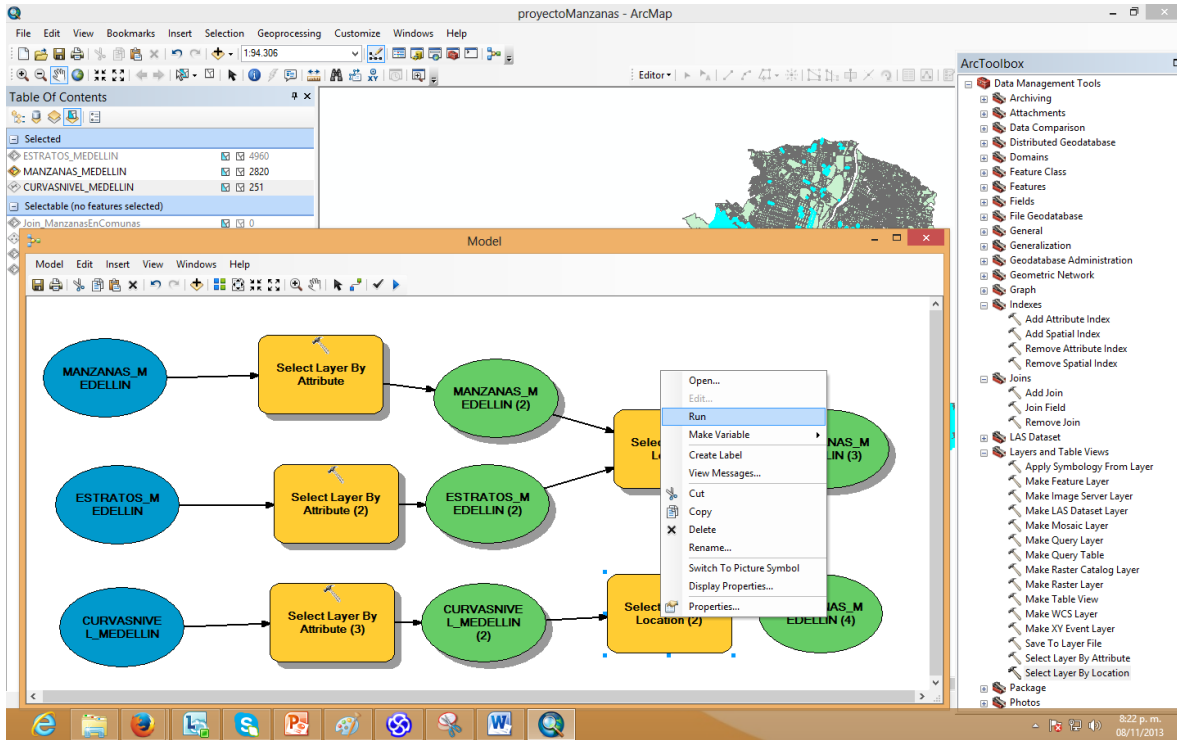
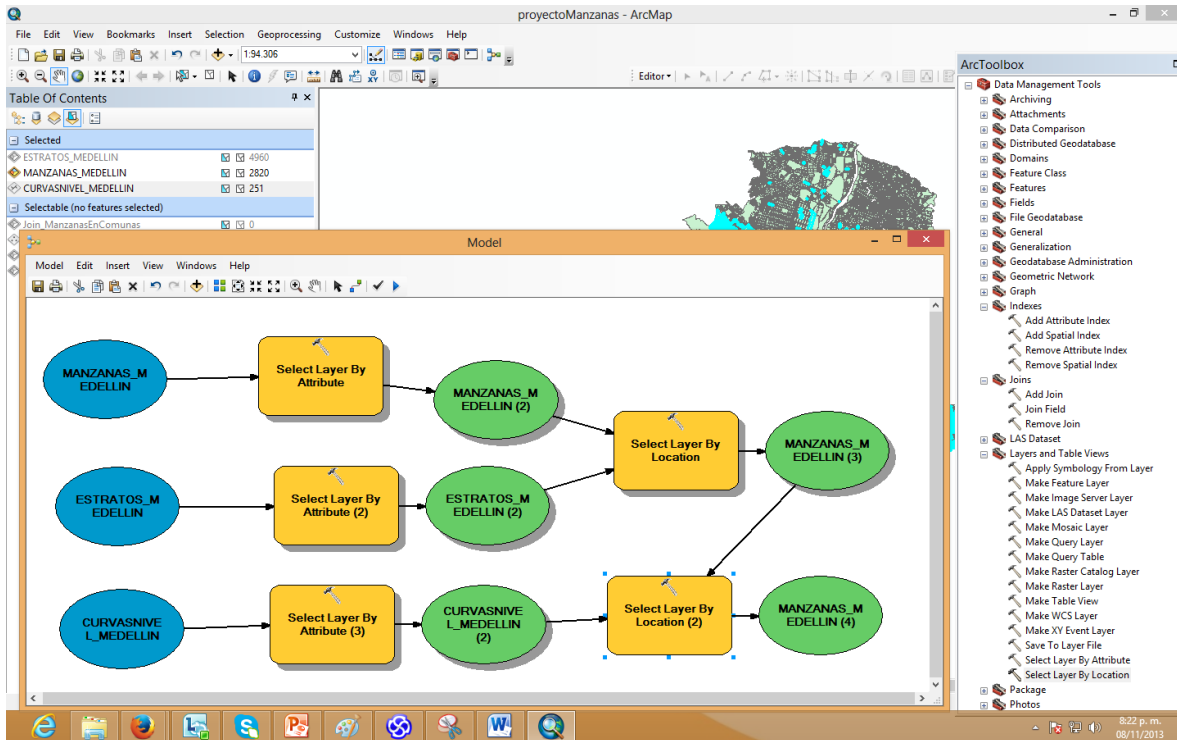


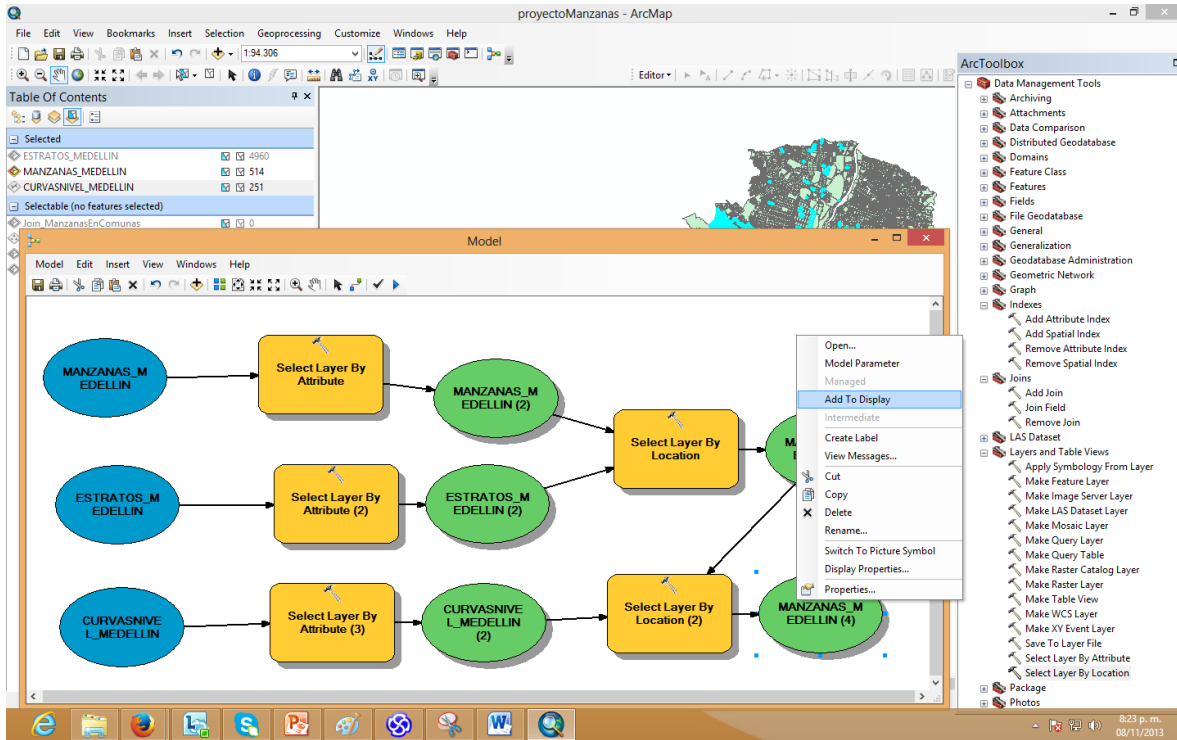
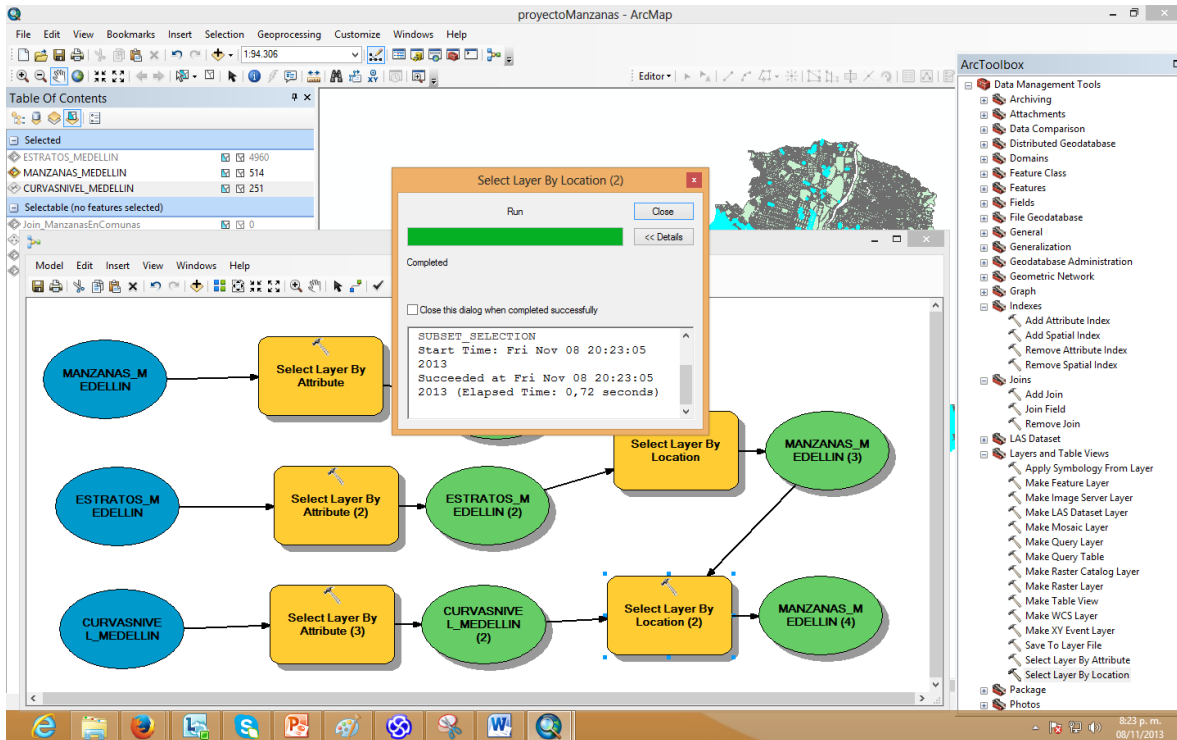


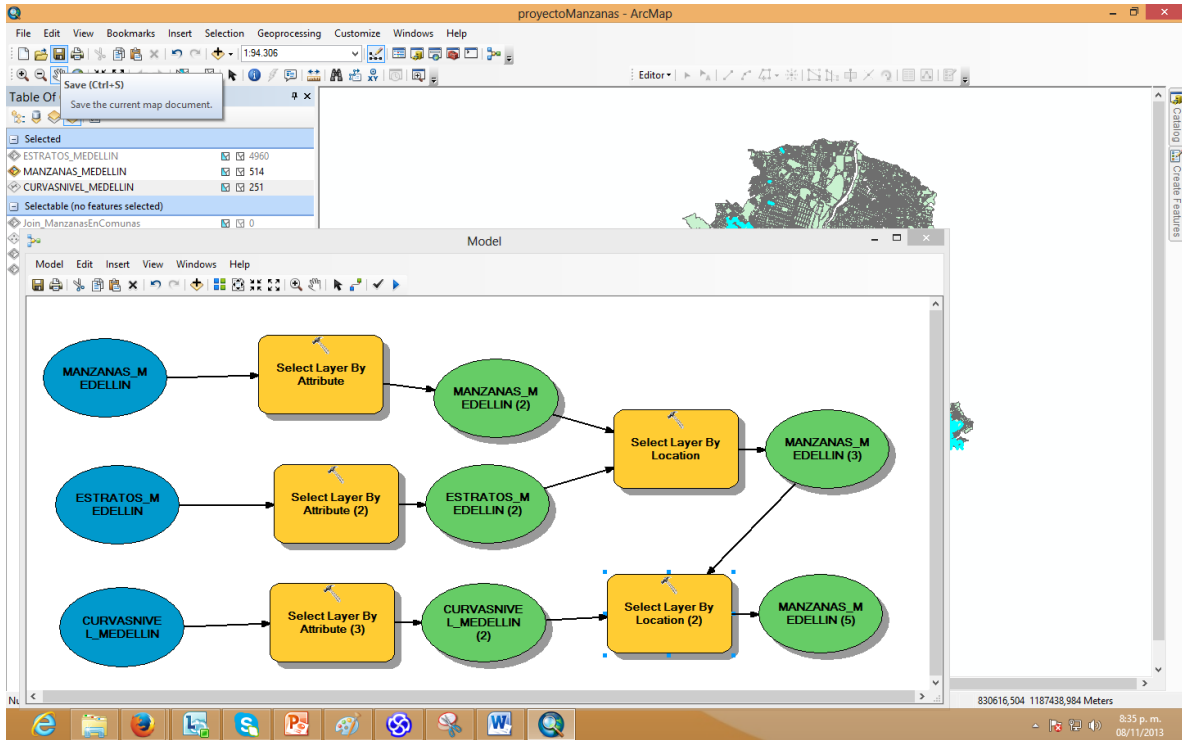
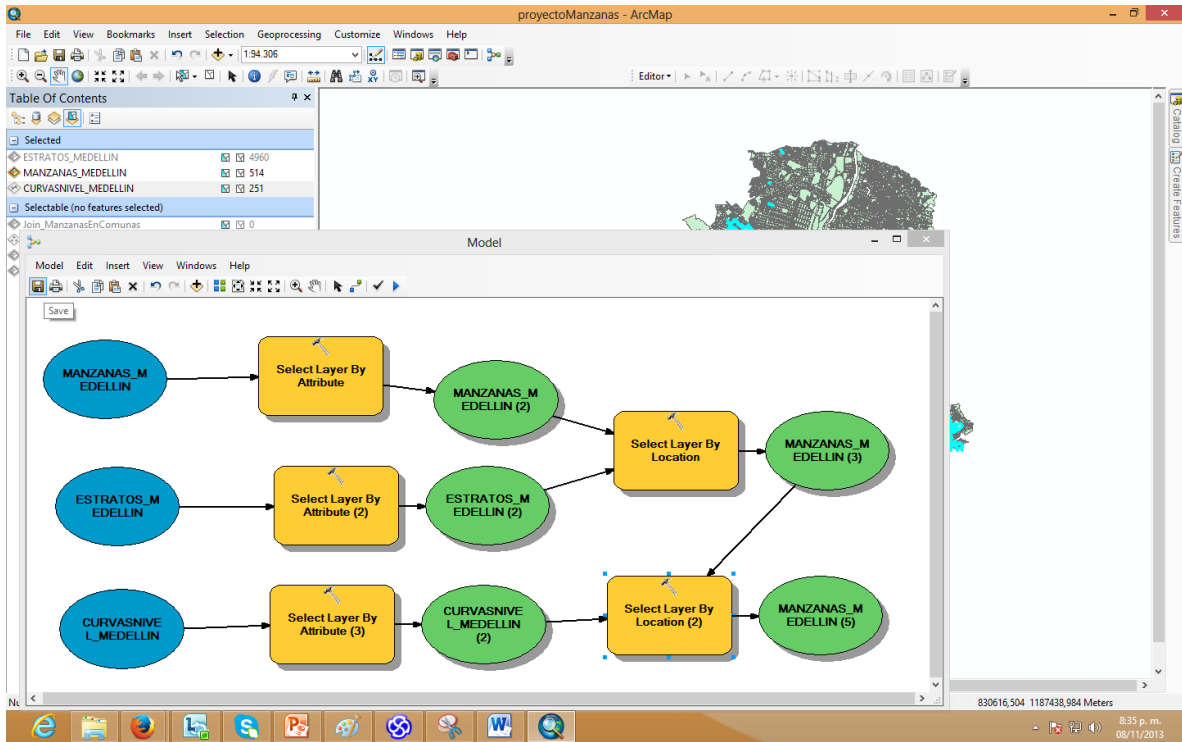




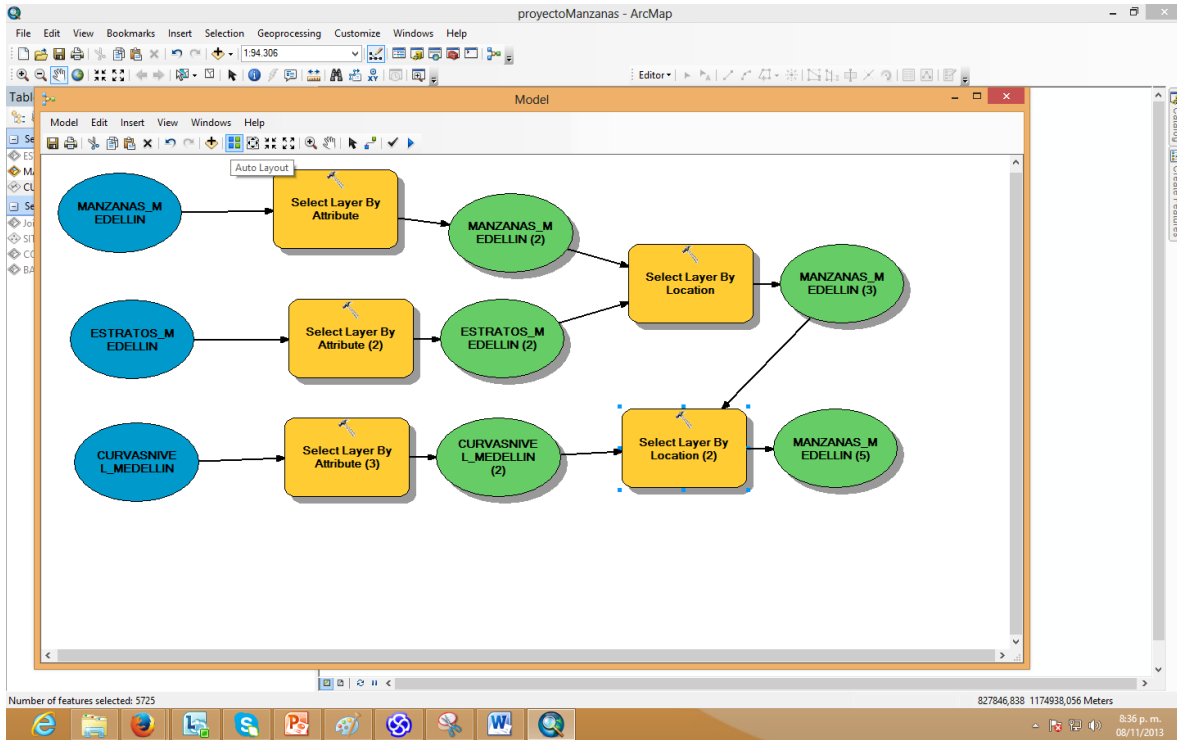
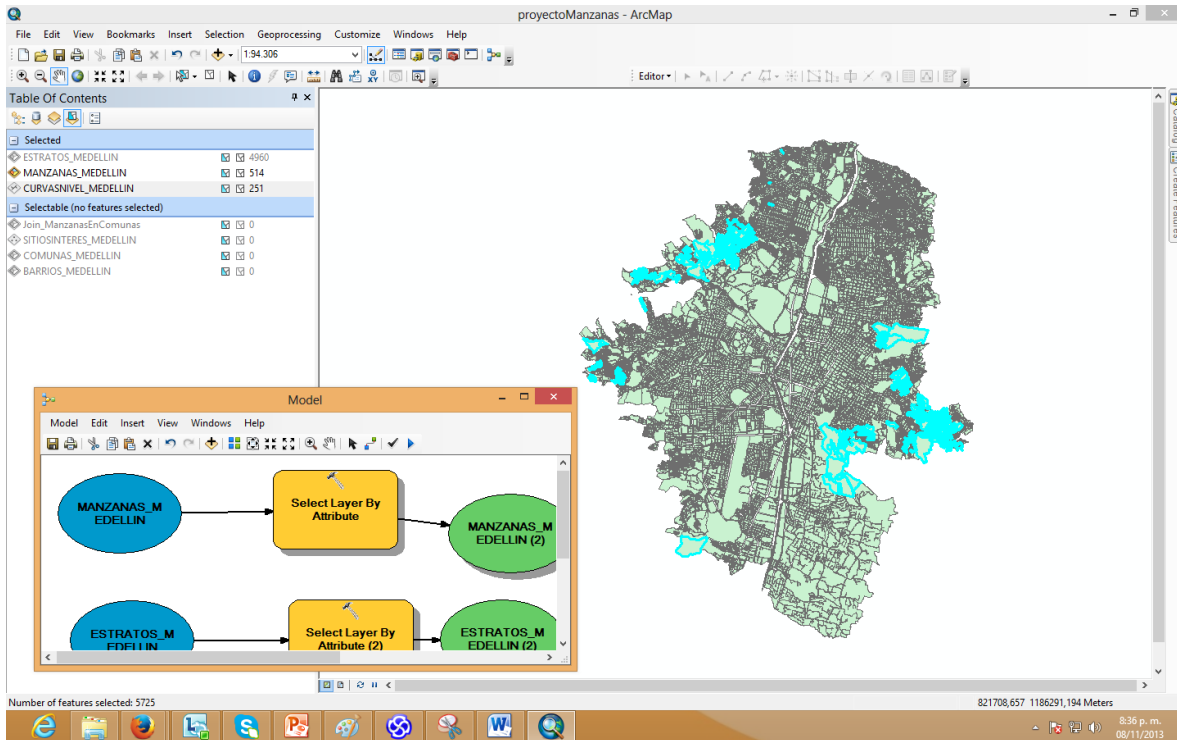


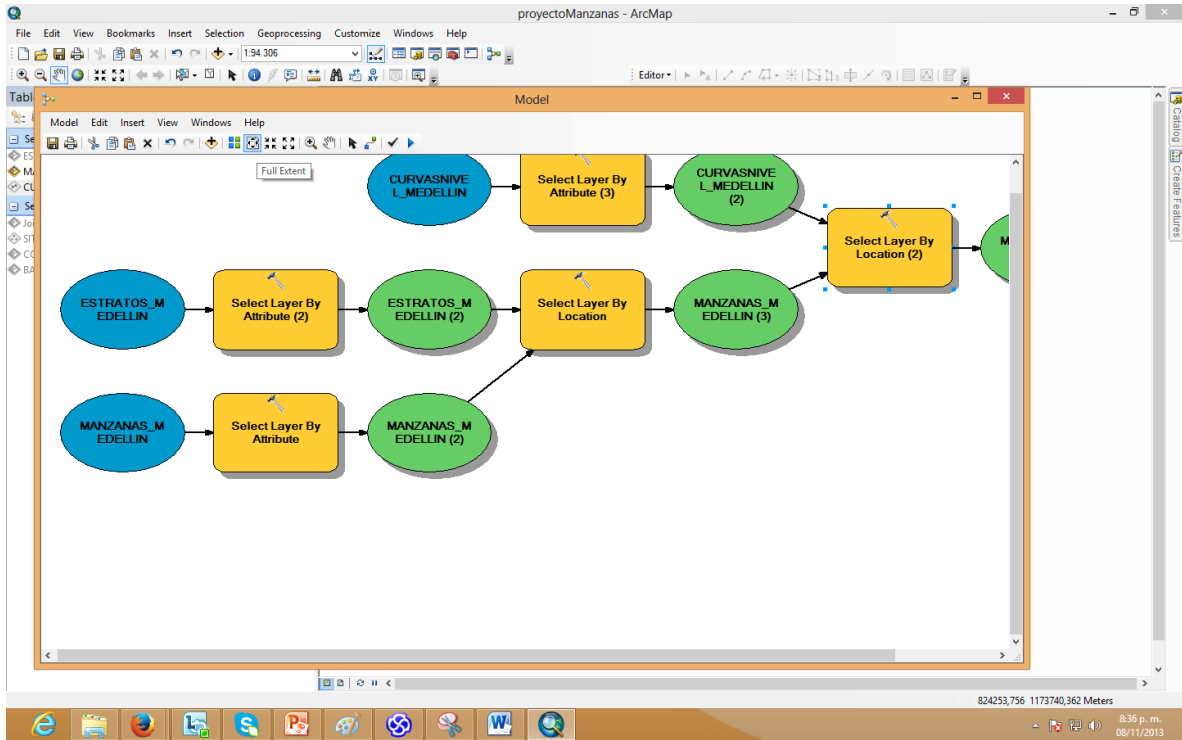
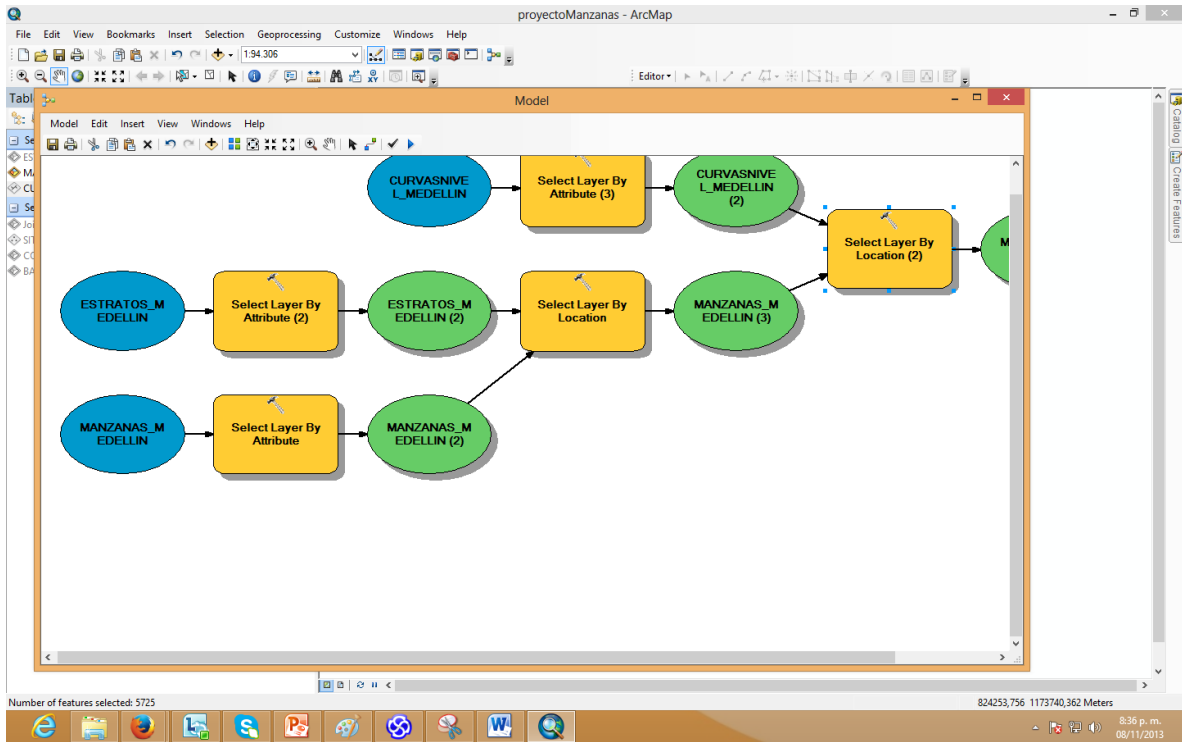


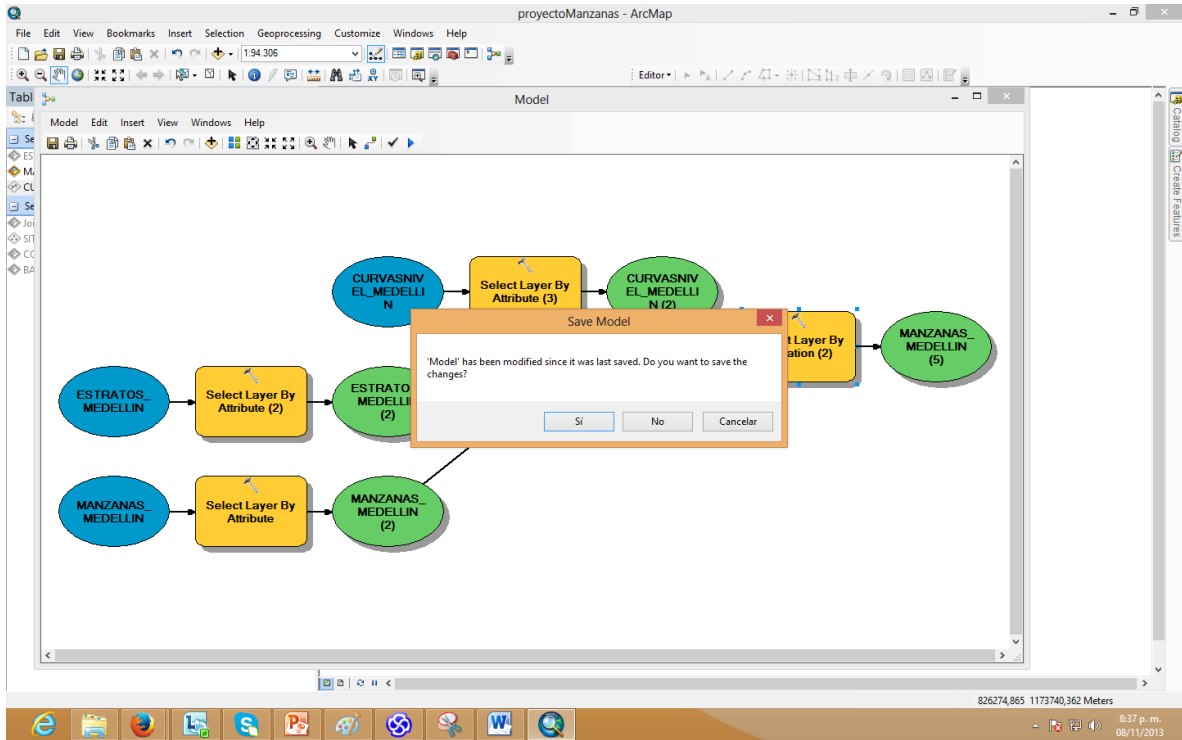
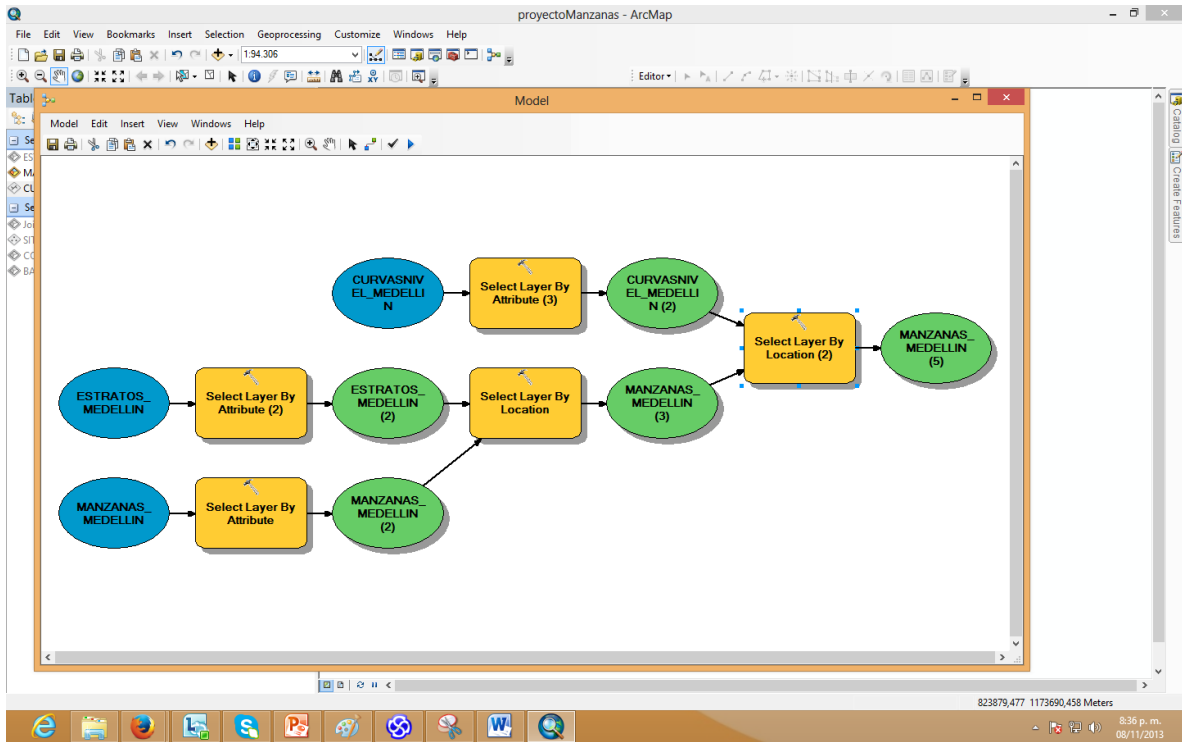


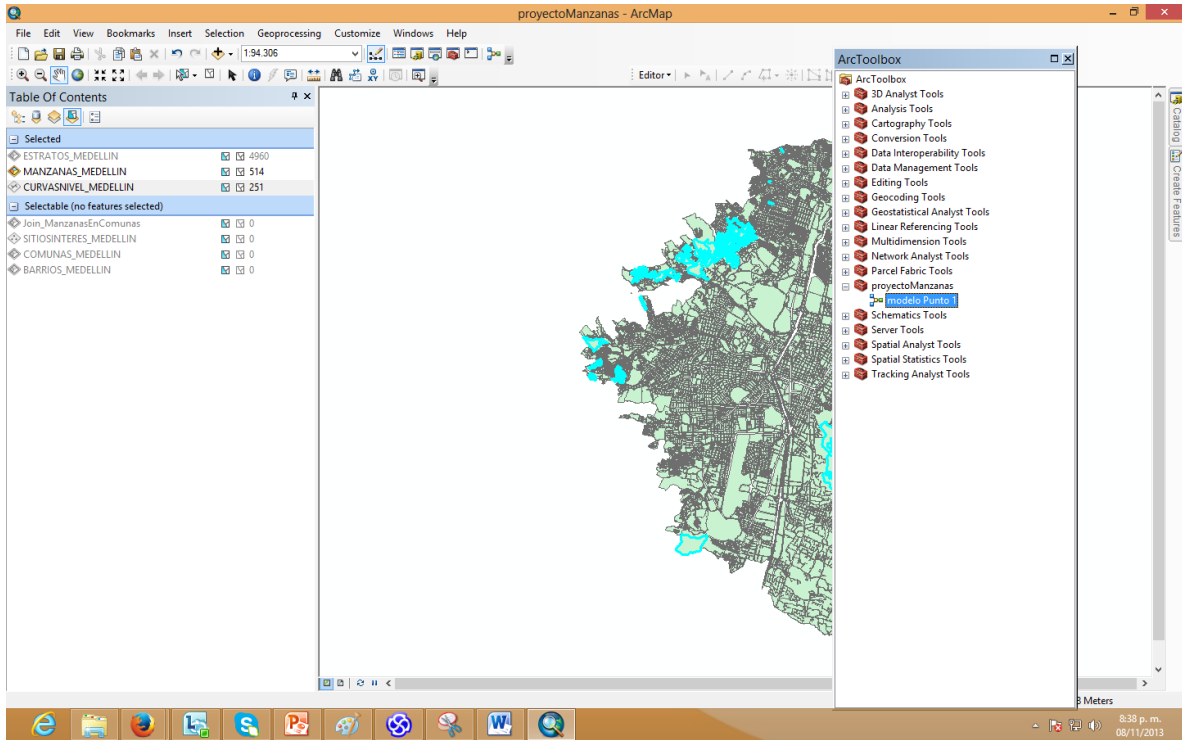
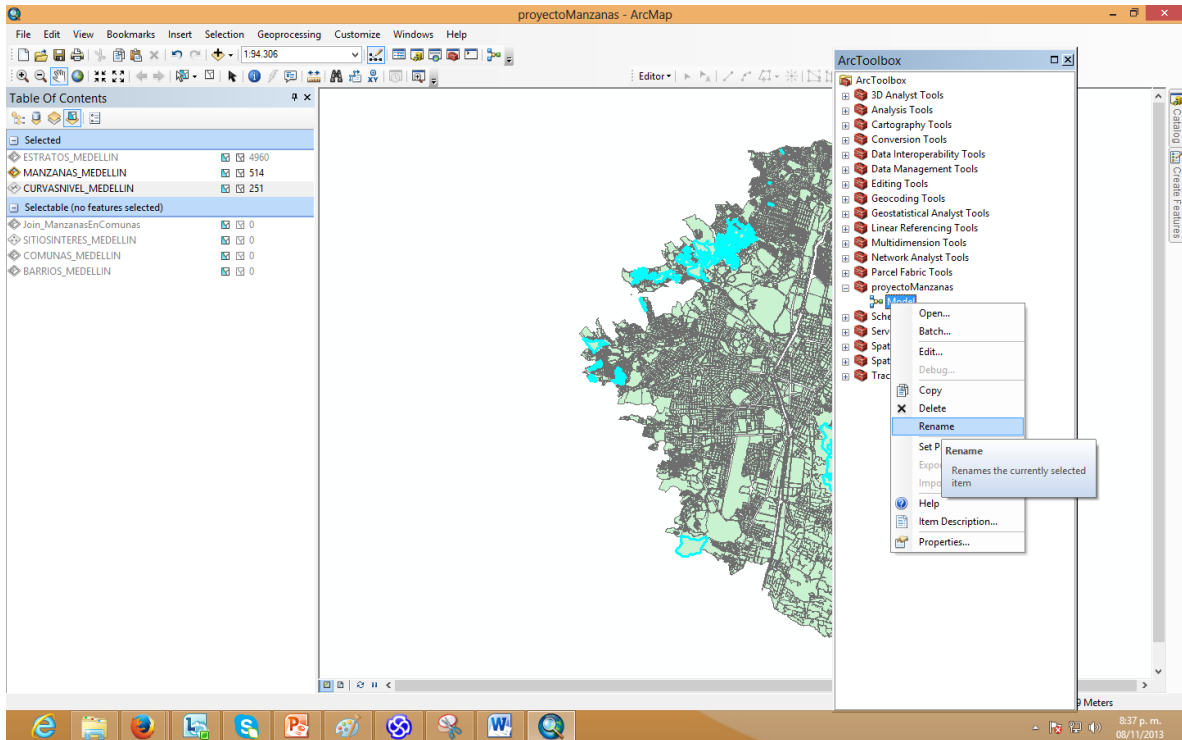




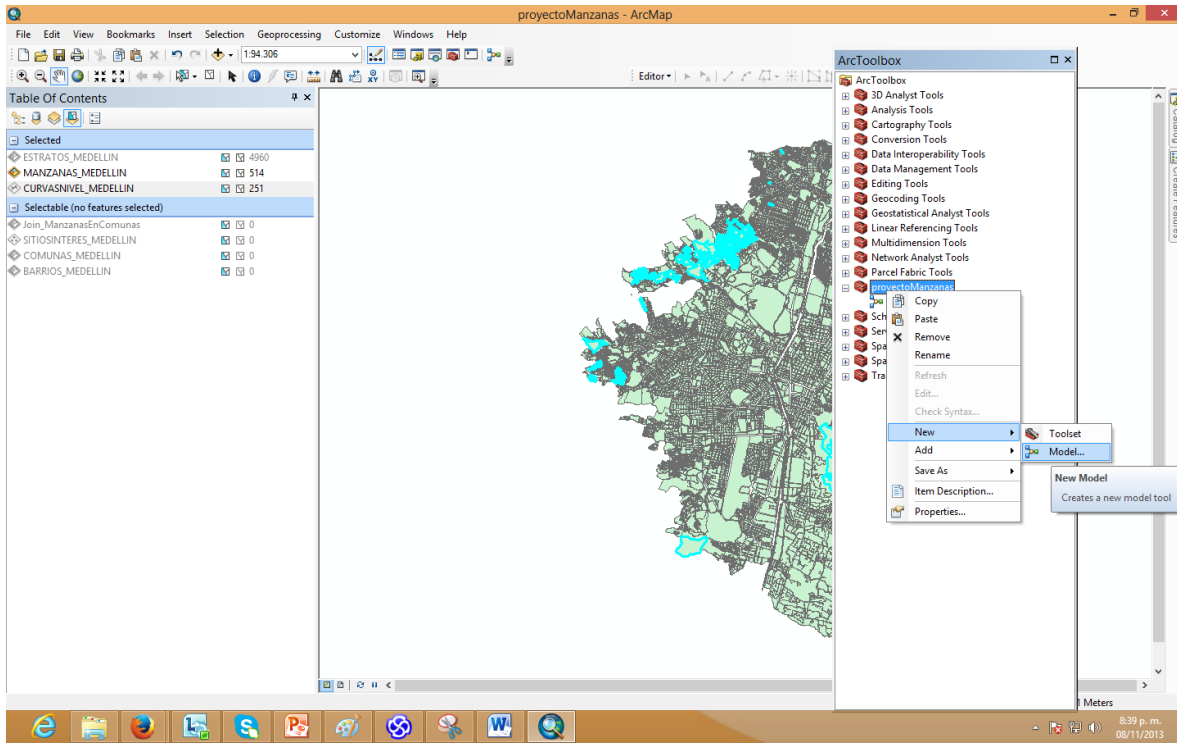


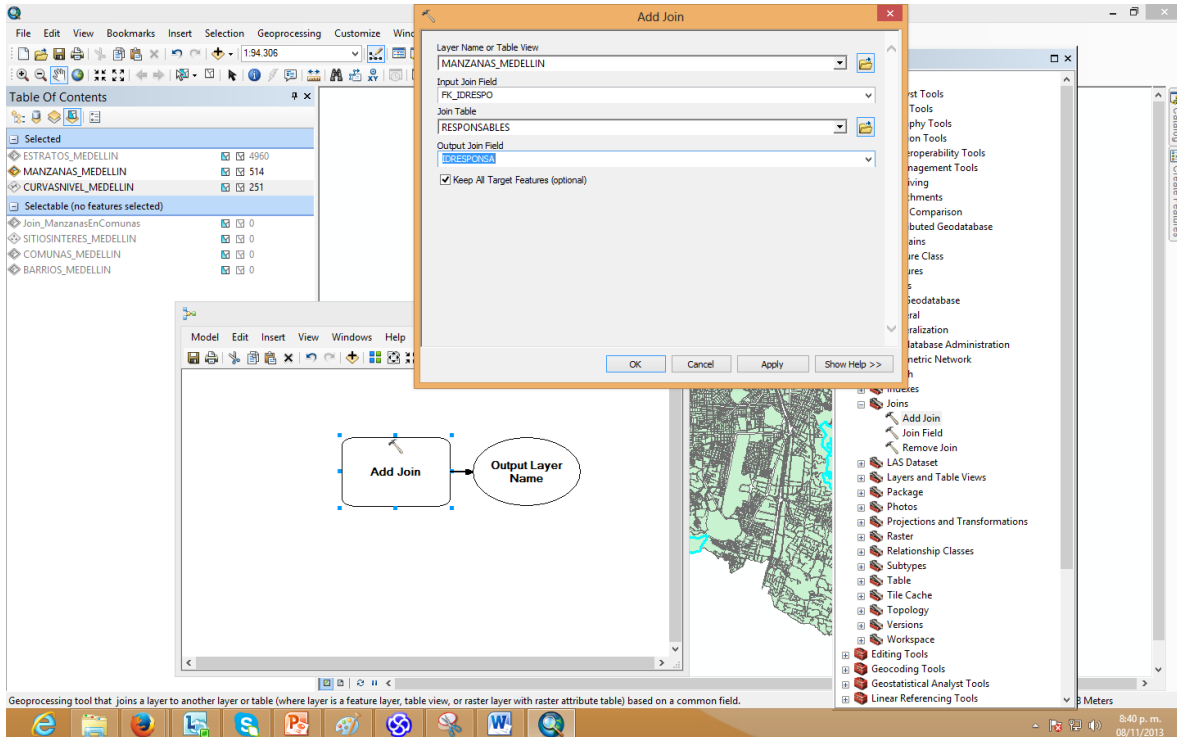
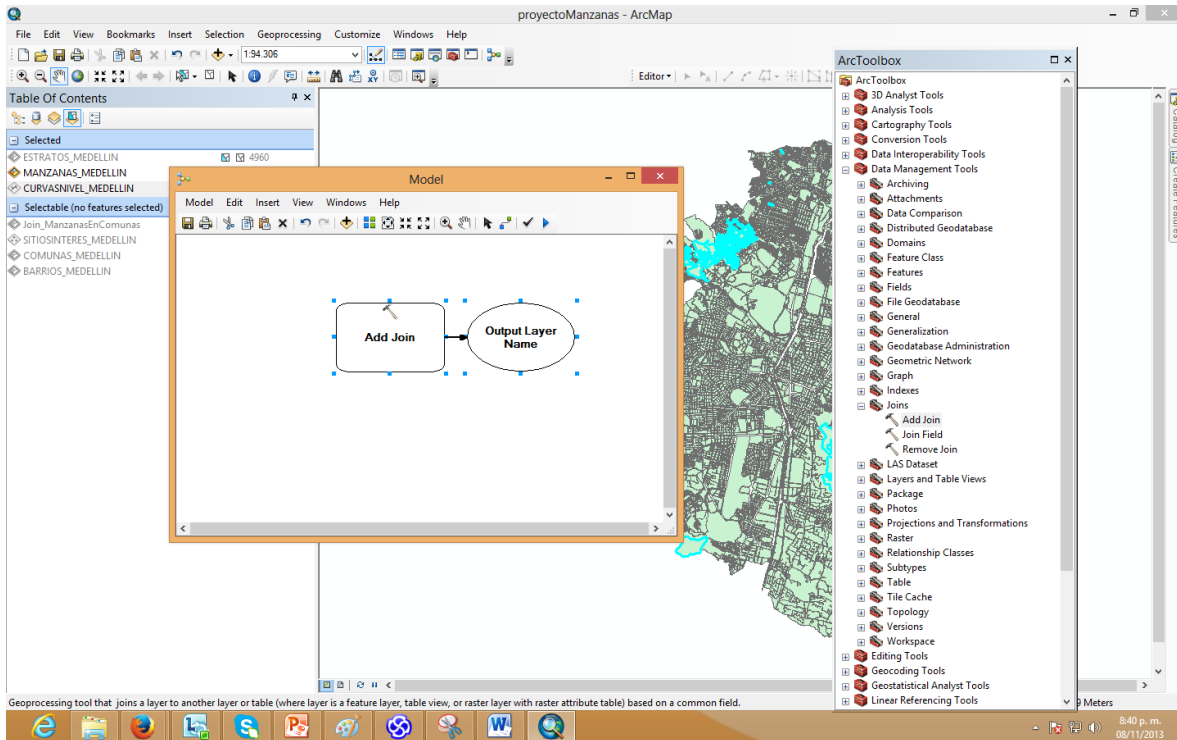


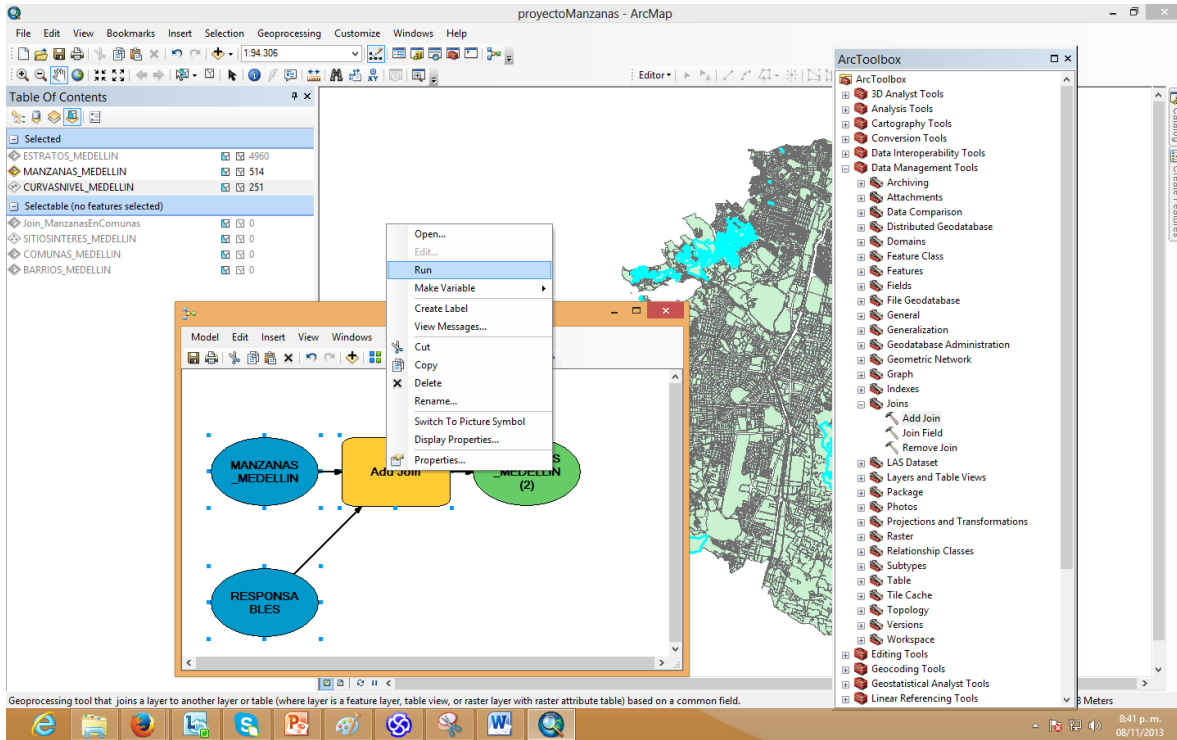
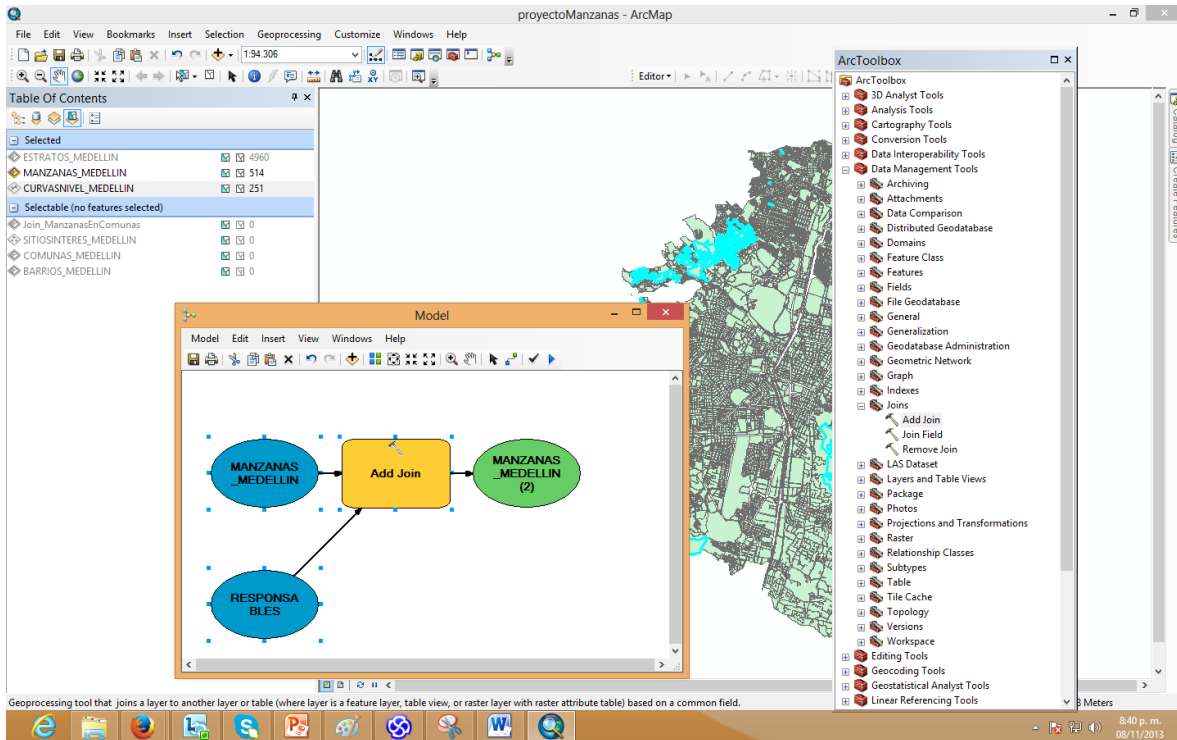


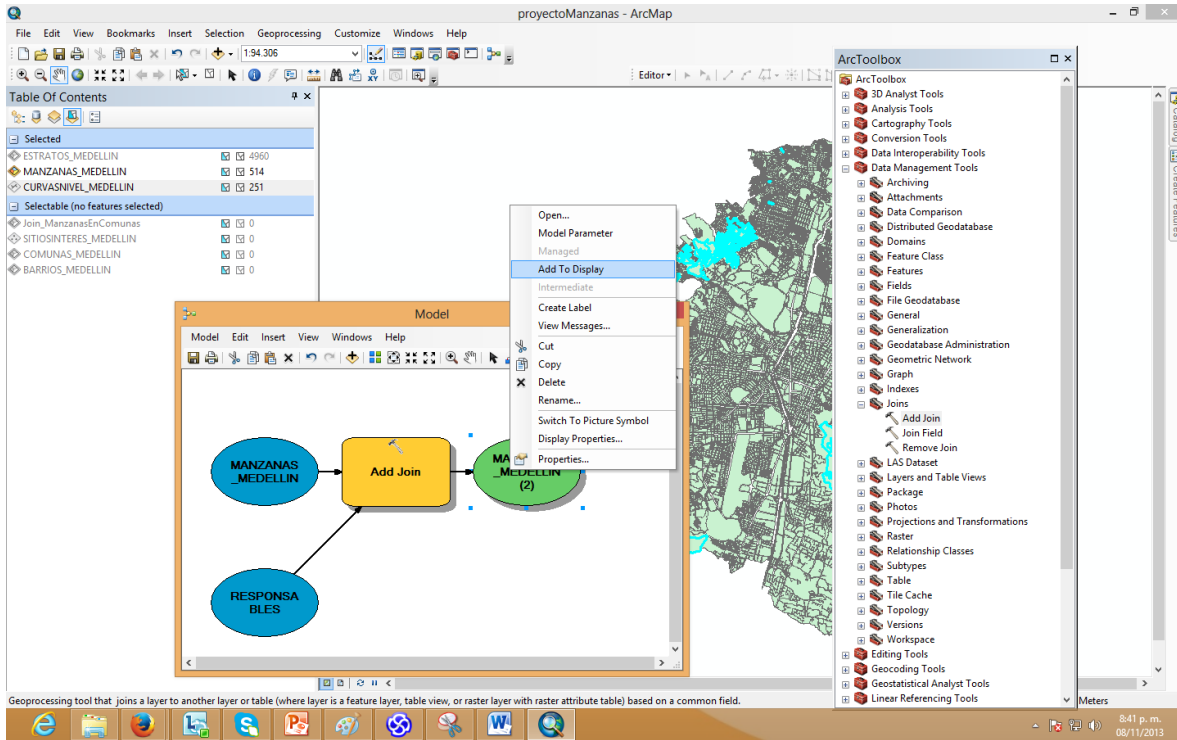
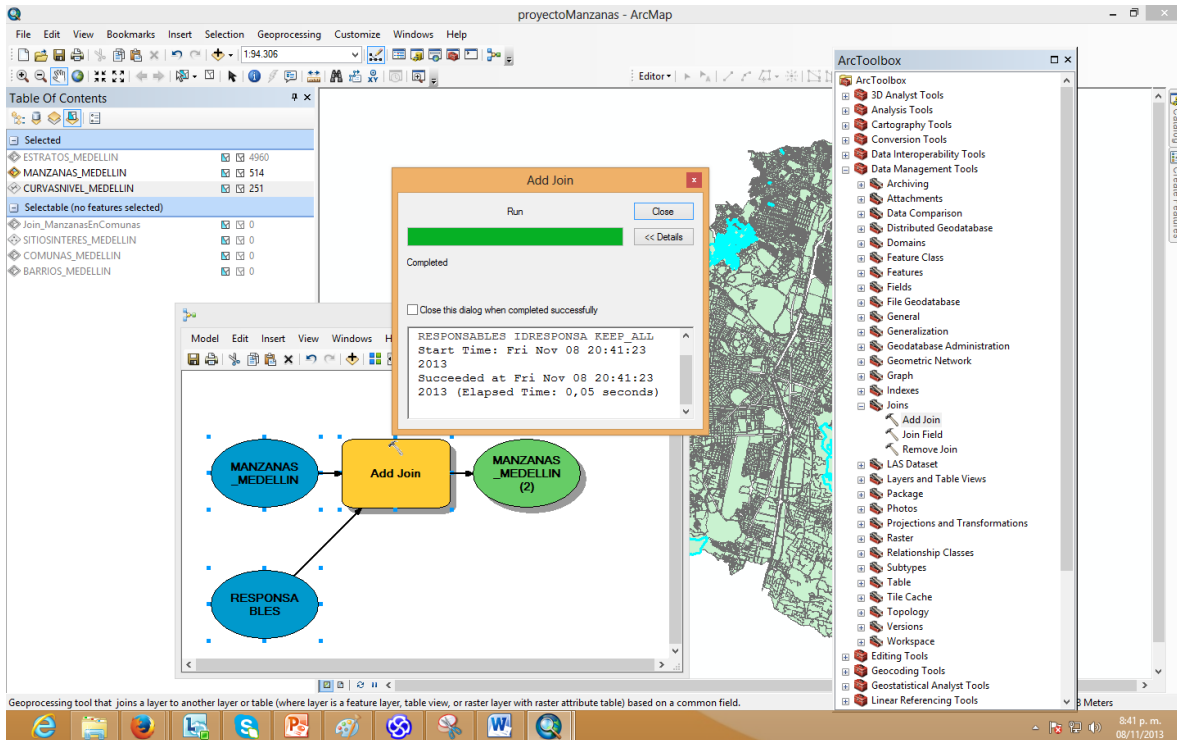


Mostrar las Manzanas que están a una altura entre 1500 y 1750 metros y de las cuales son responsables 'Adelaida Morales Dejodas', 'Alejandro Villanueva Hervas', 'Alfonso Rodriguez Iglesias' ó 'Ana Gómez'

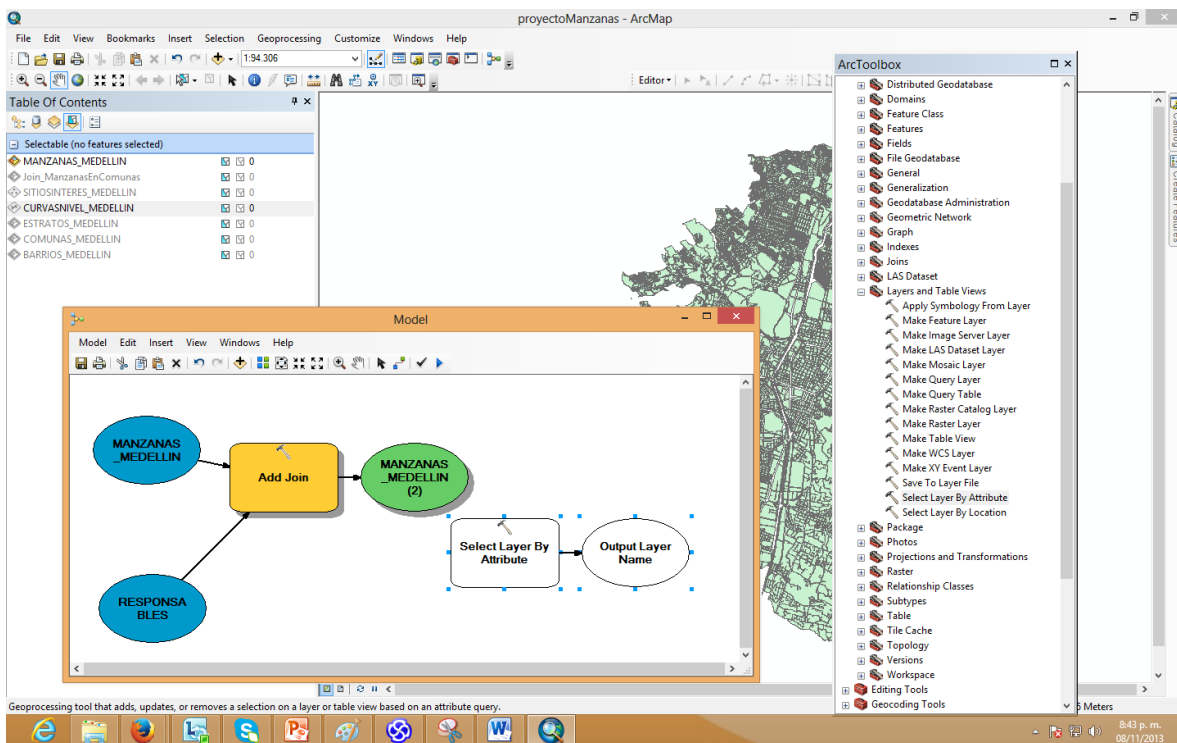
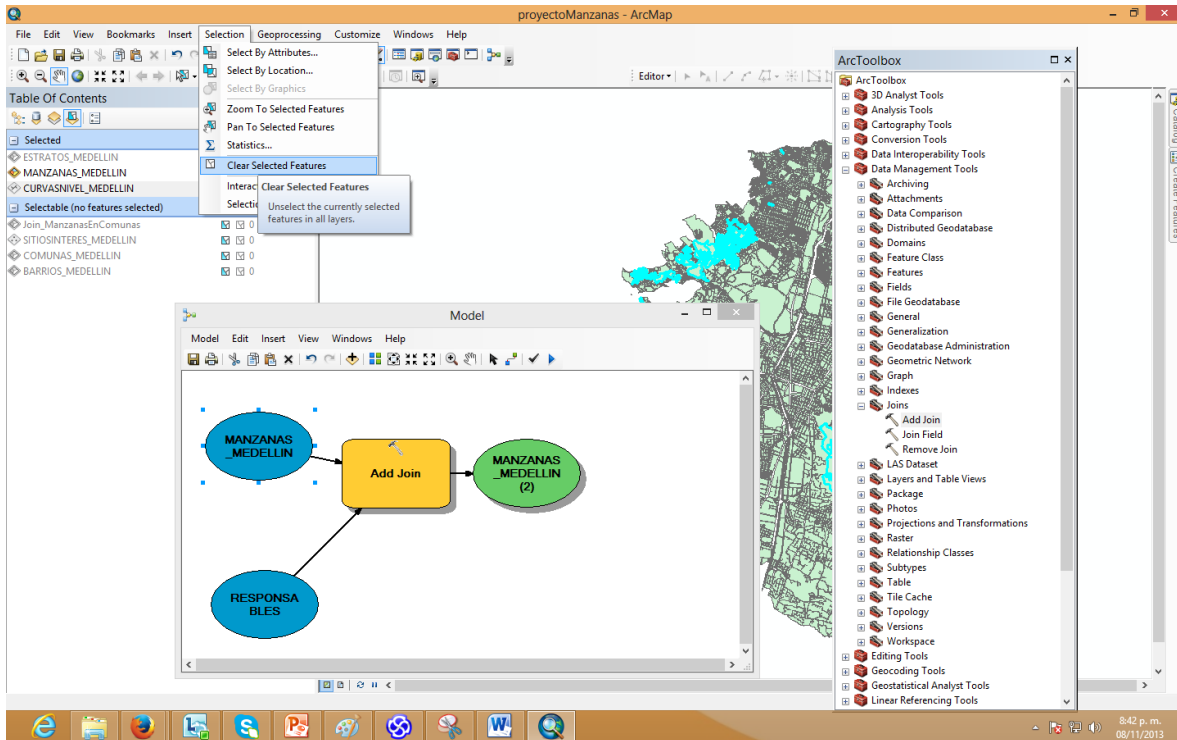


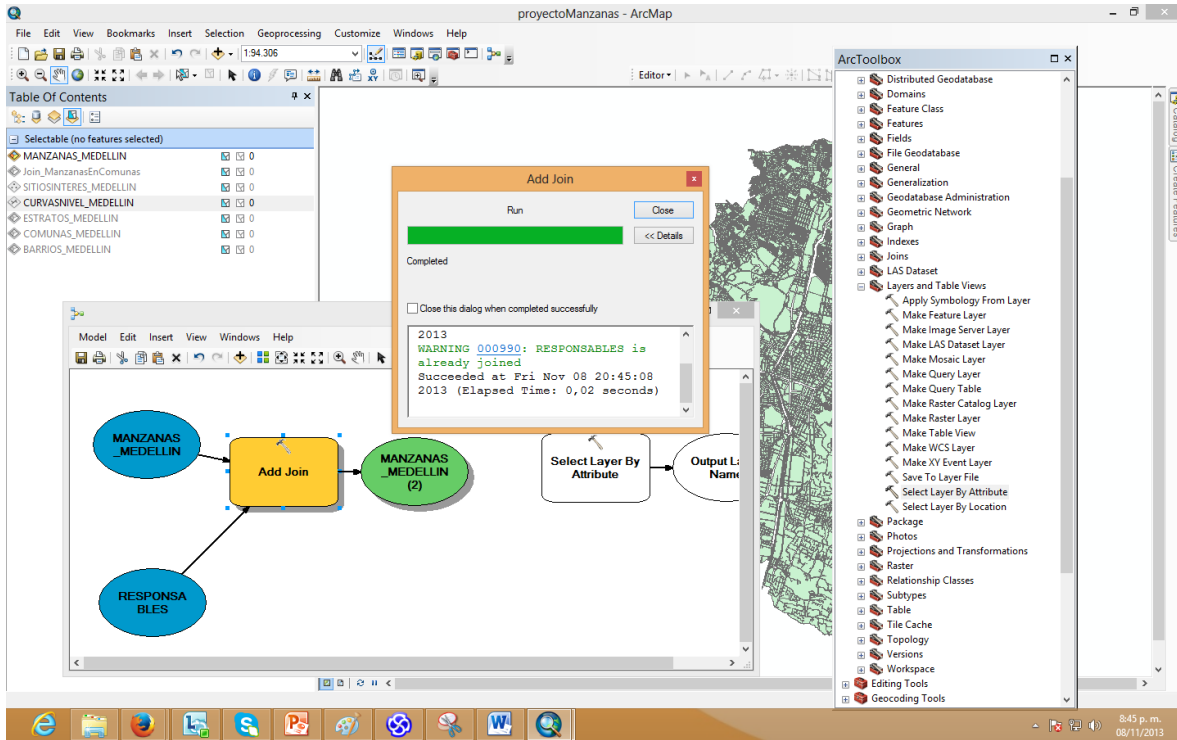
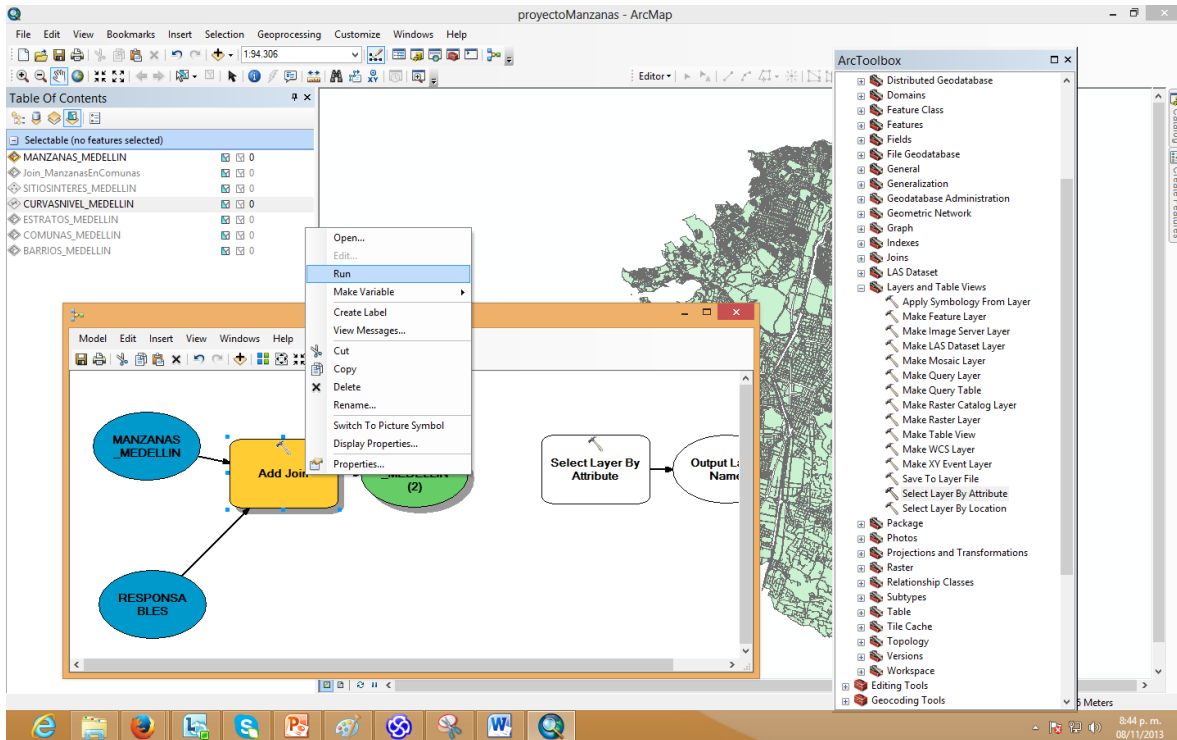


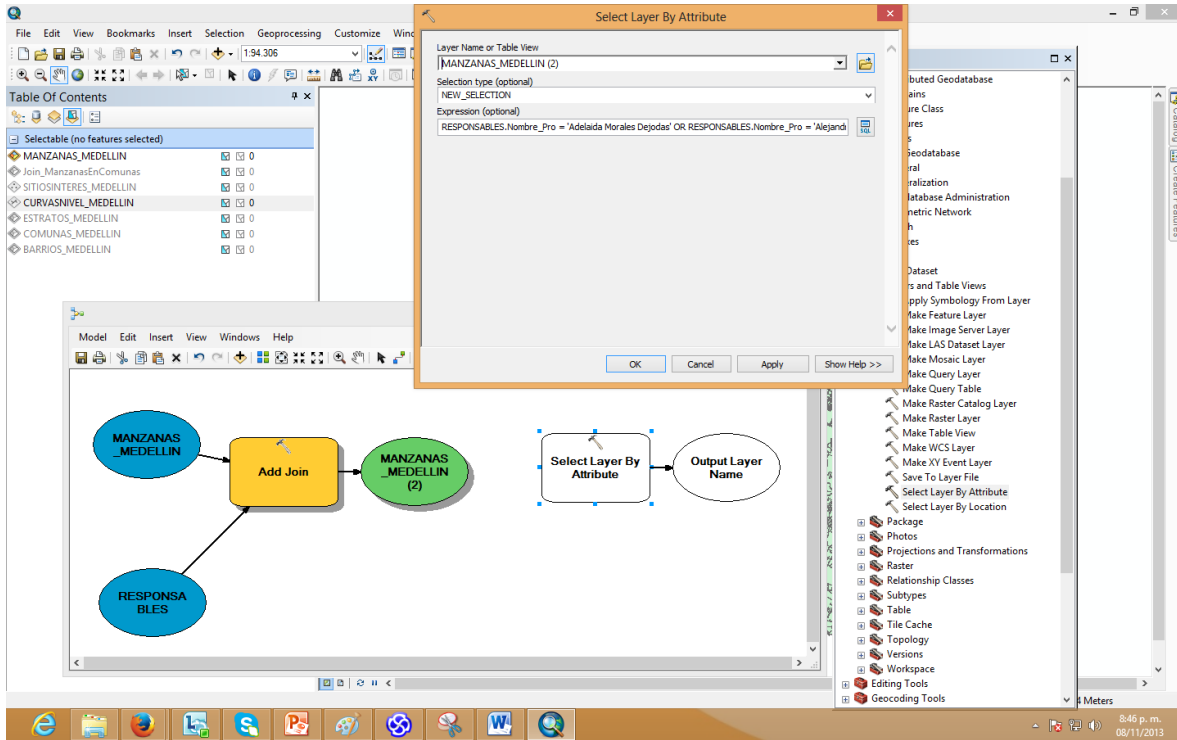
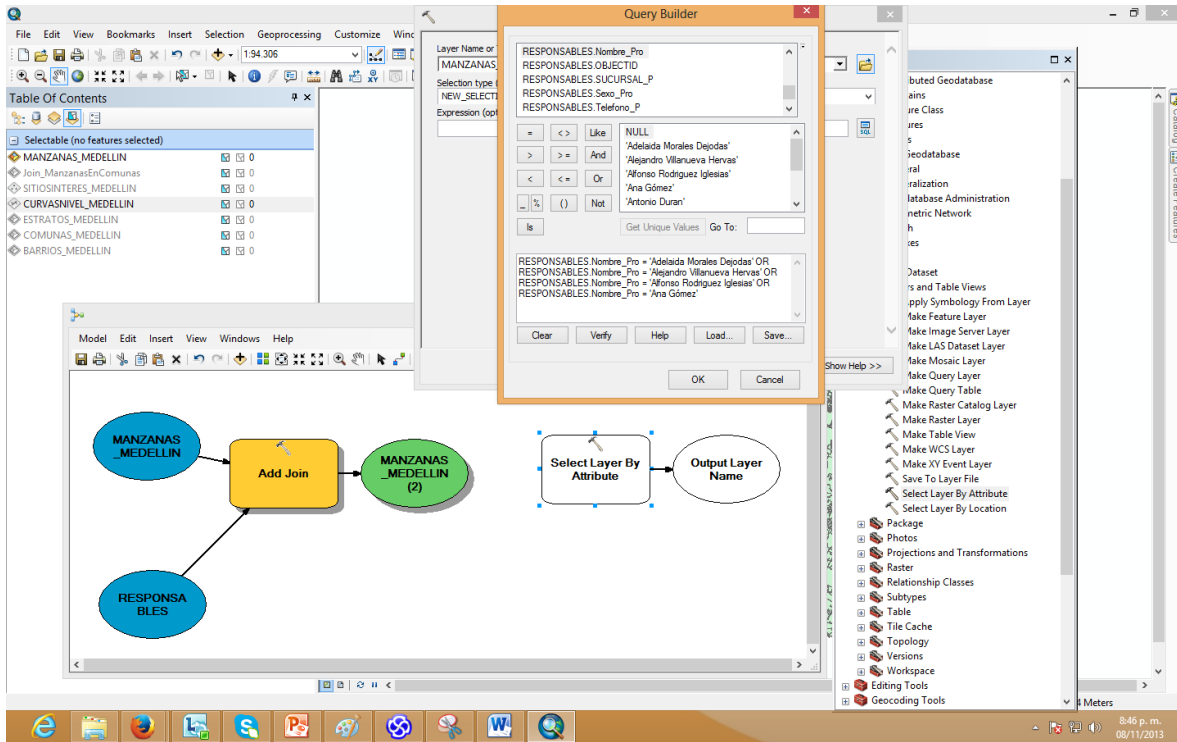


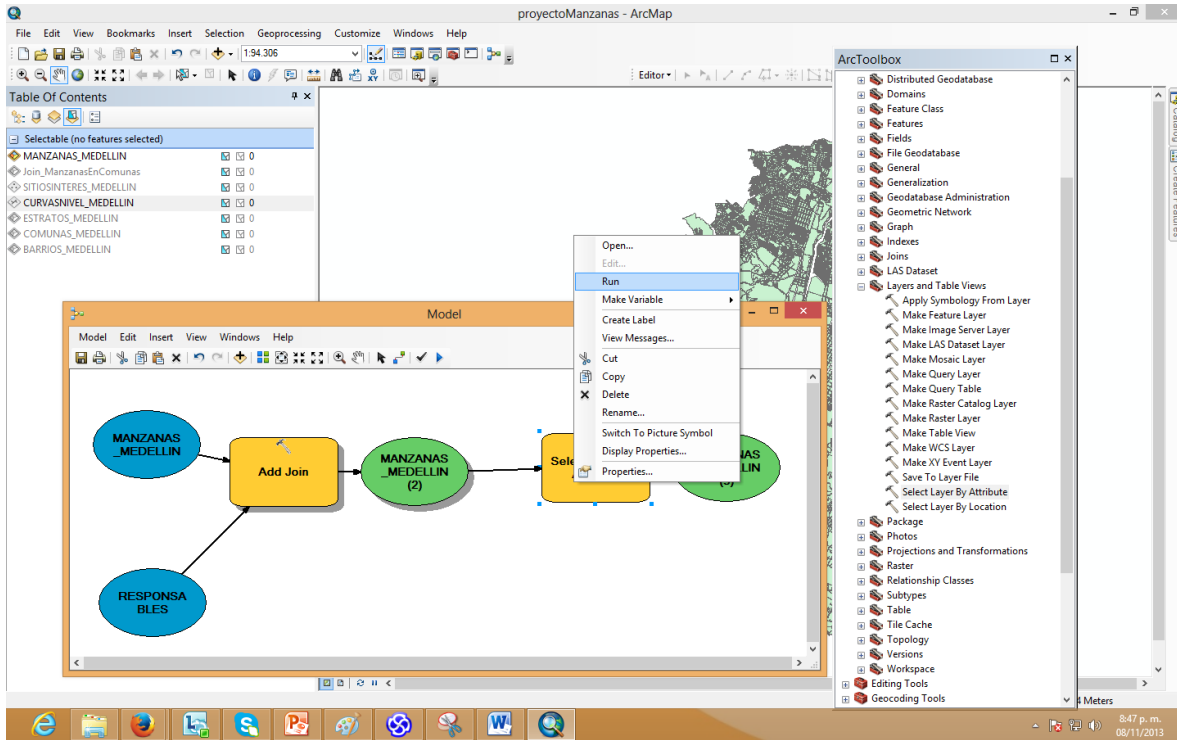
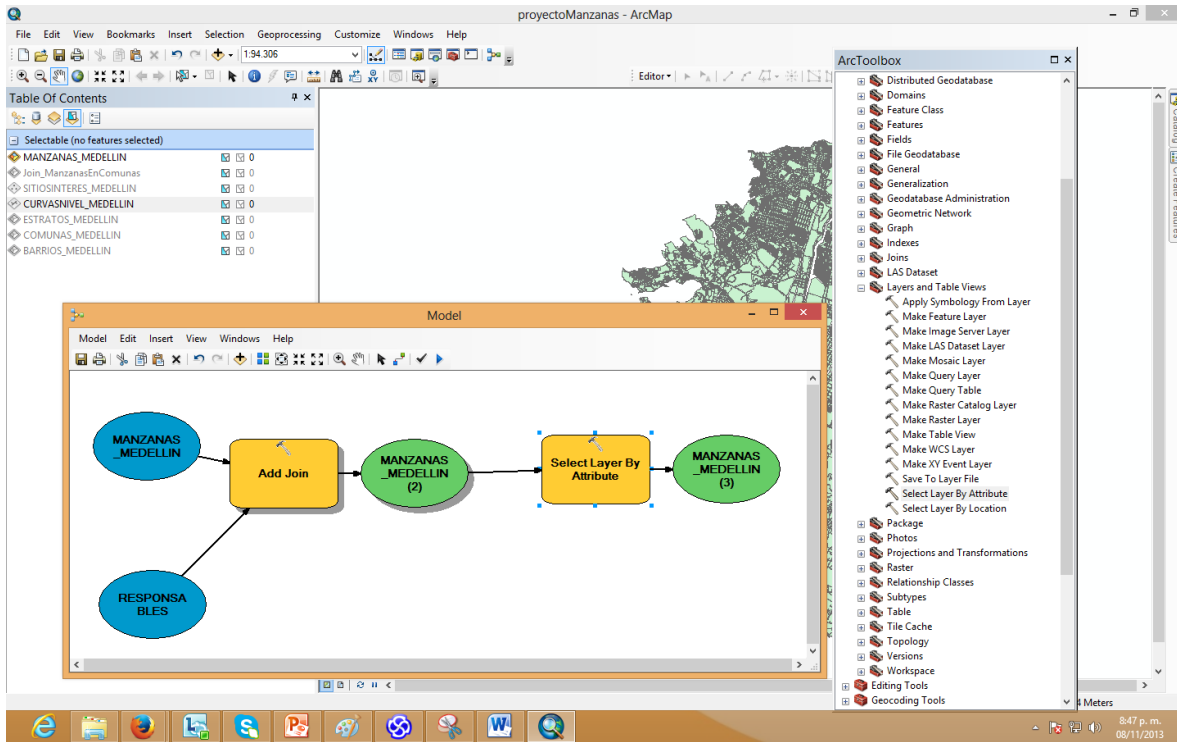


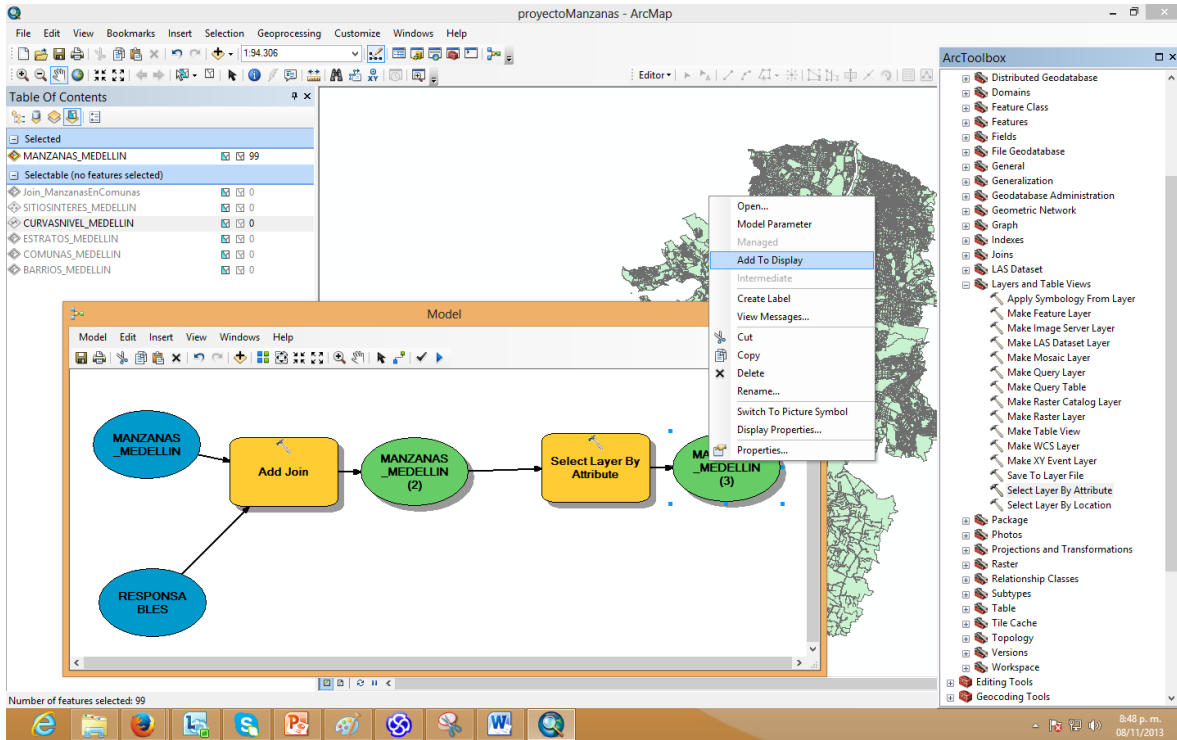
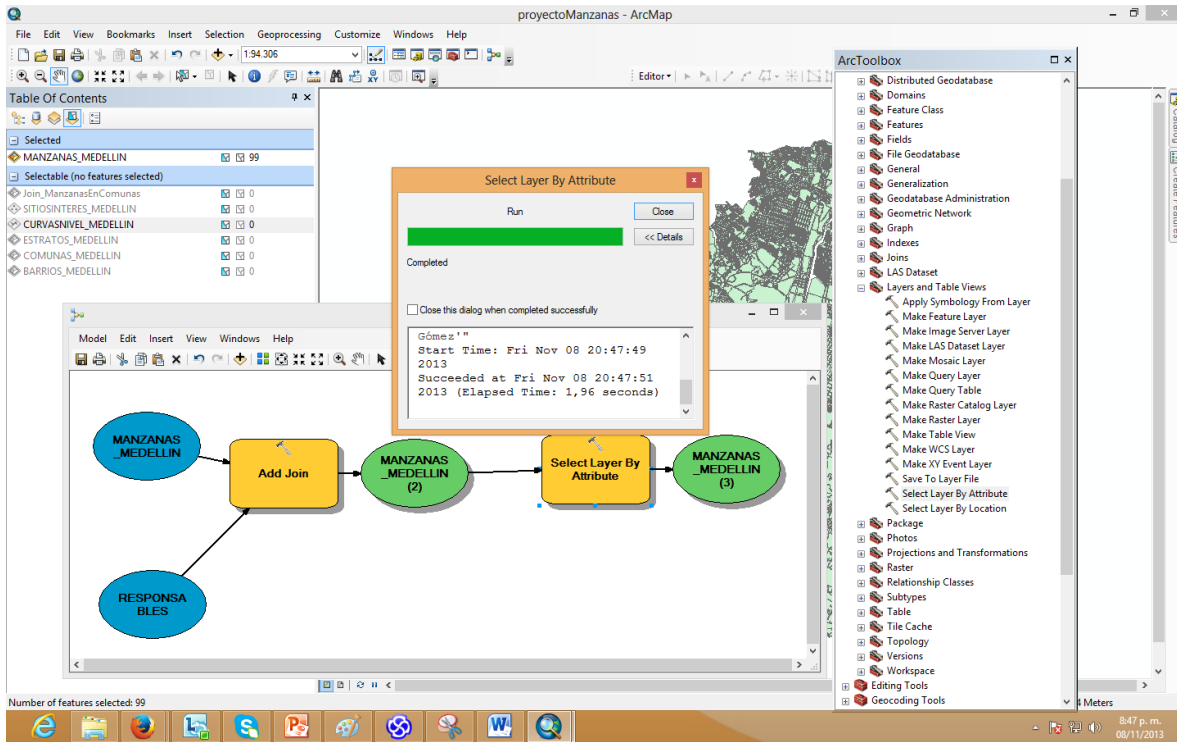


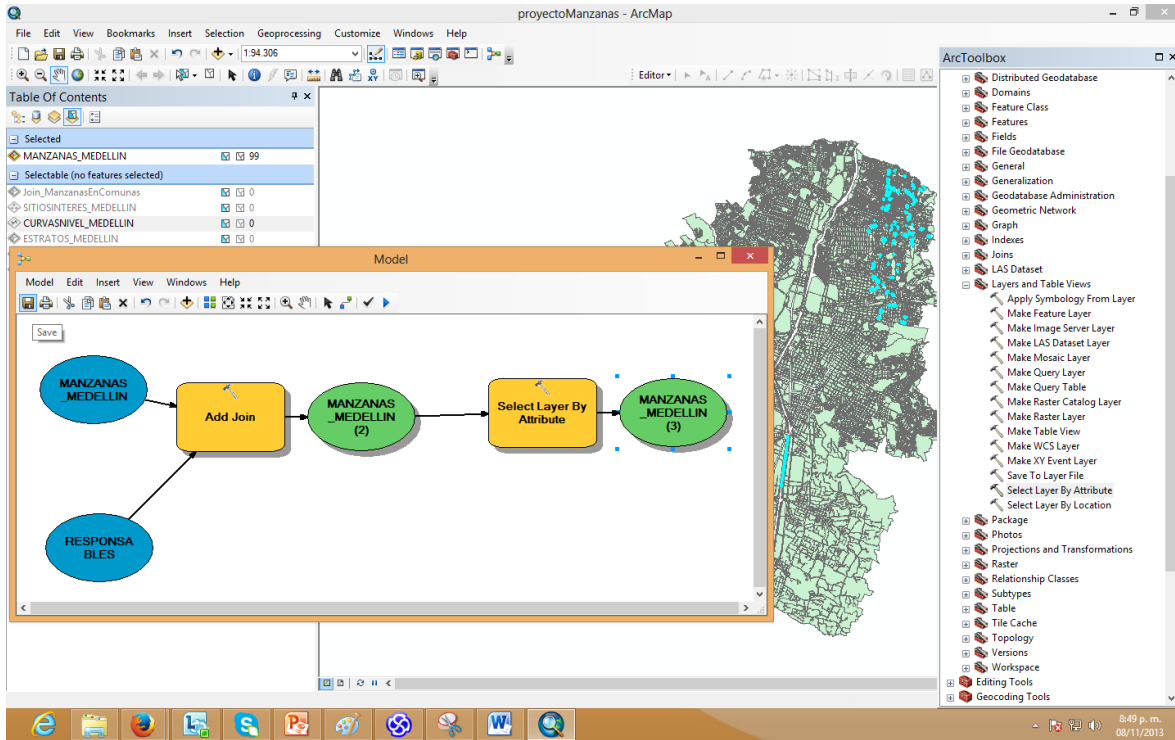
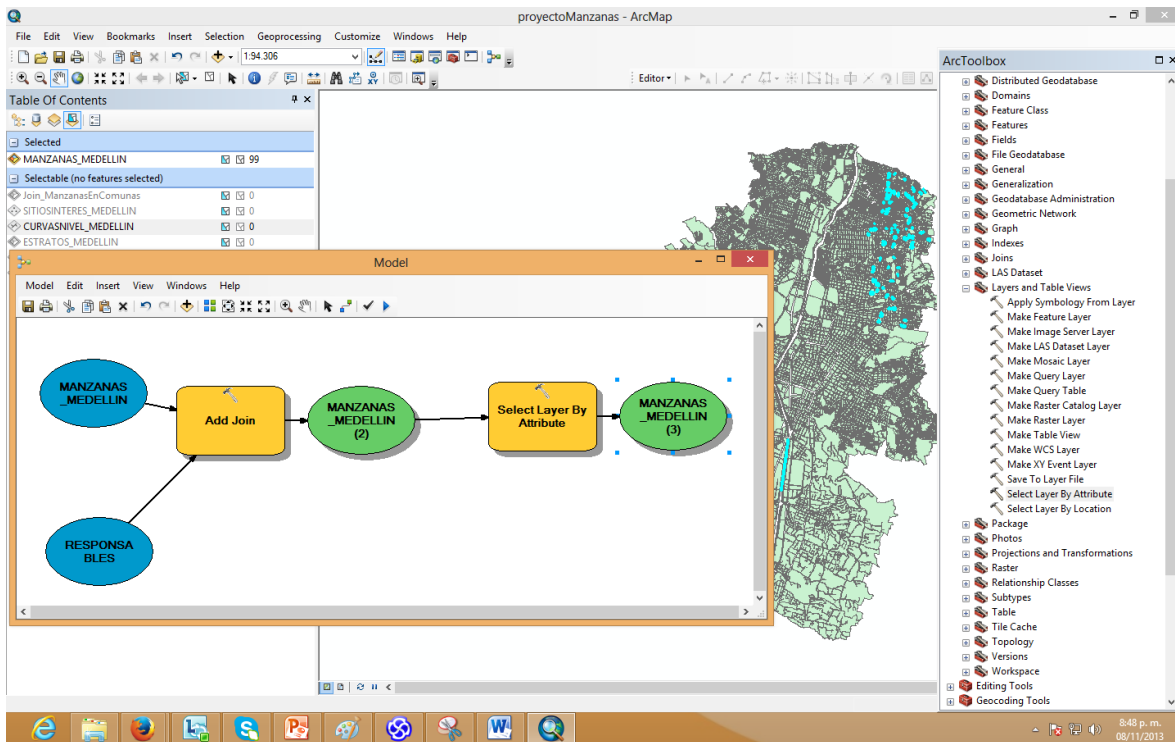


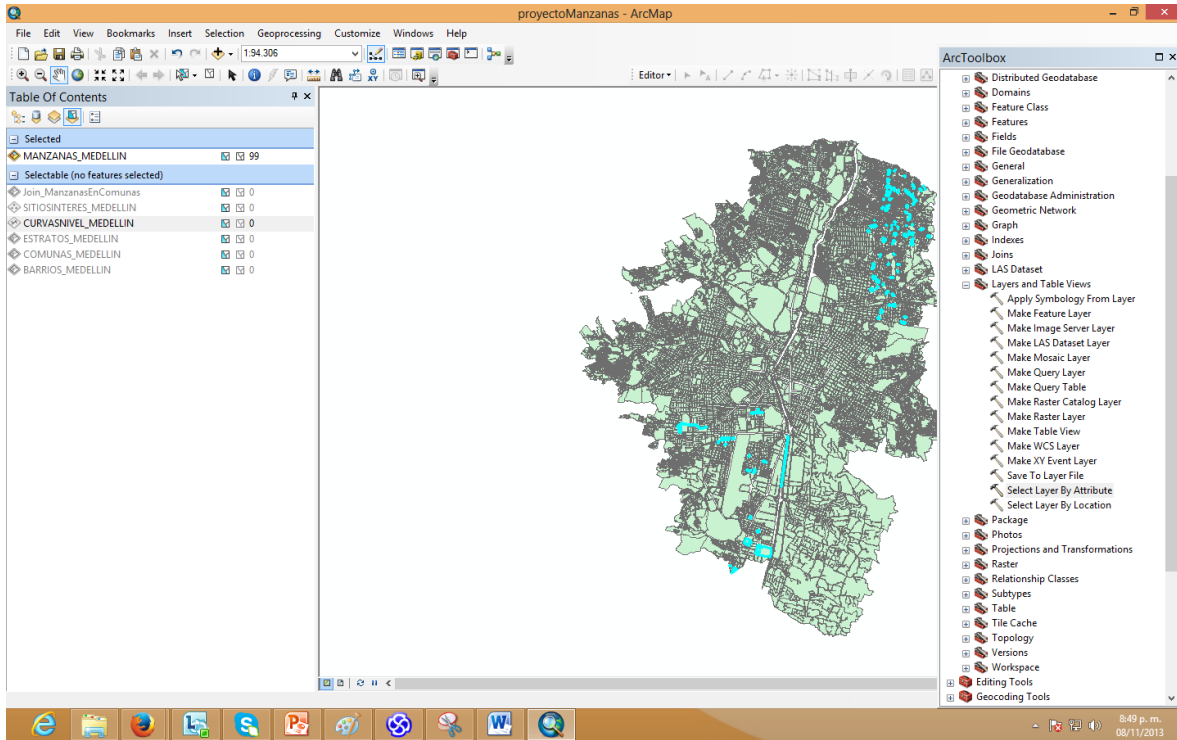
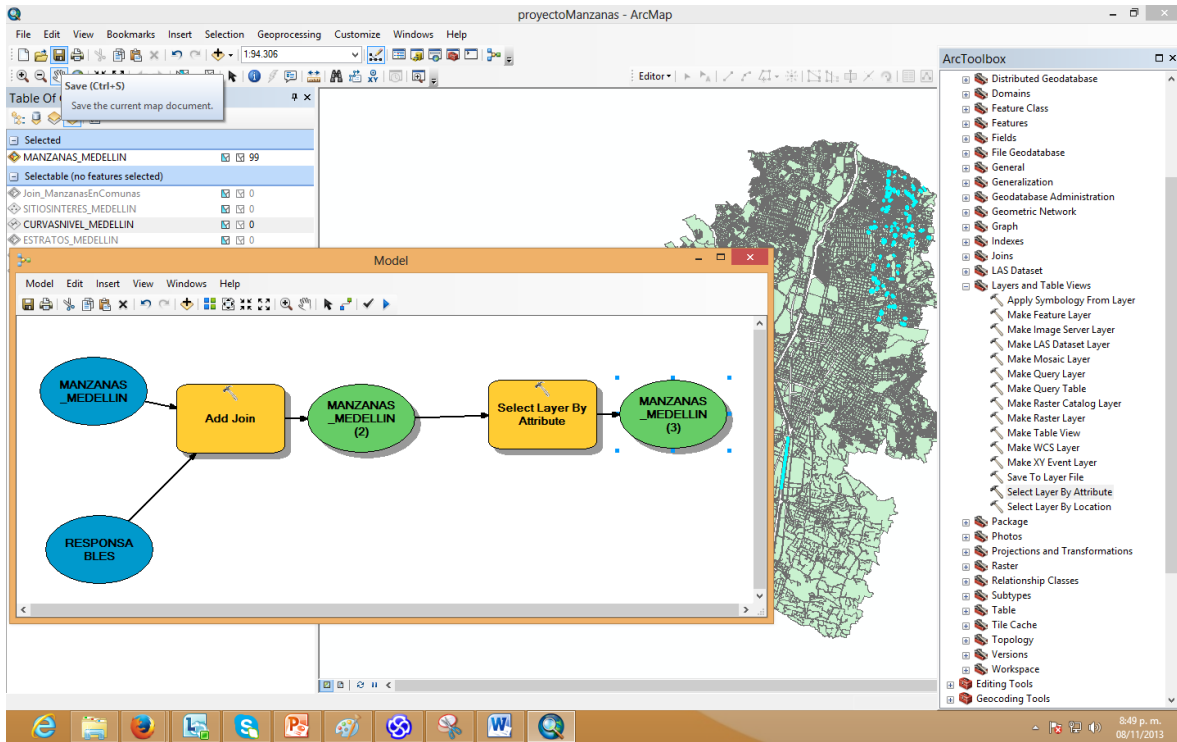


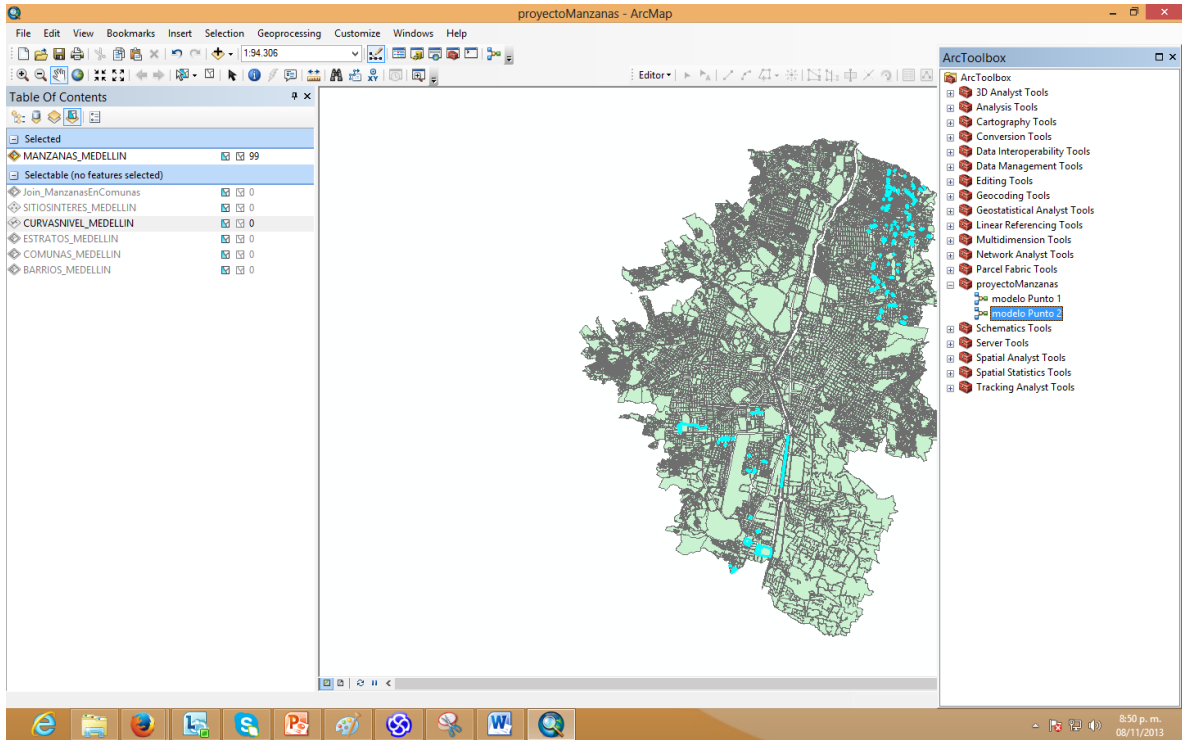
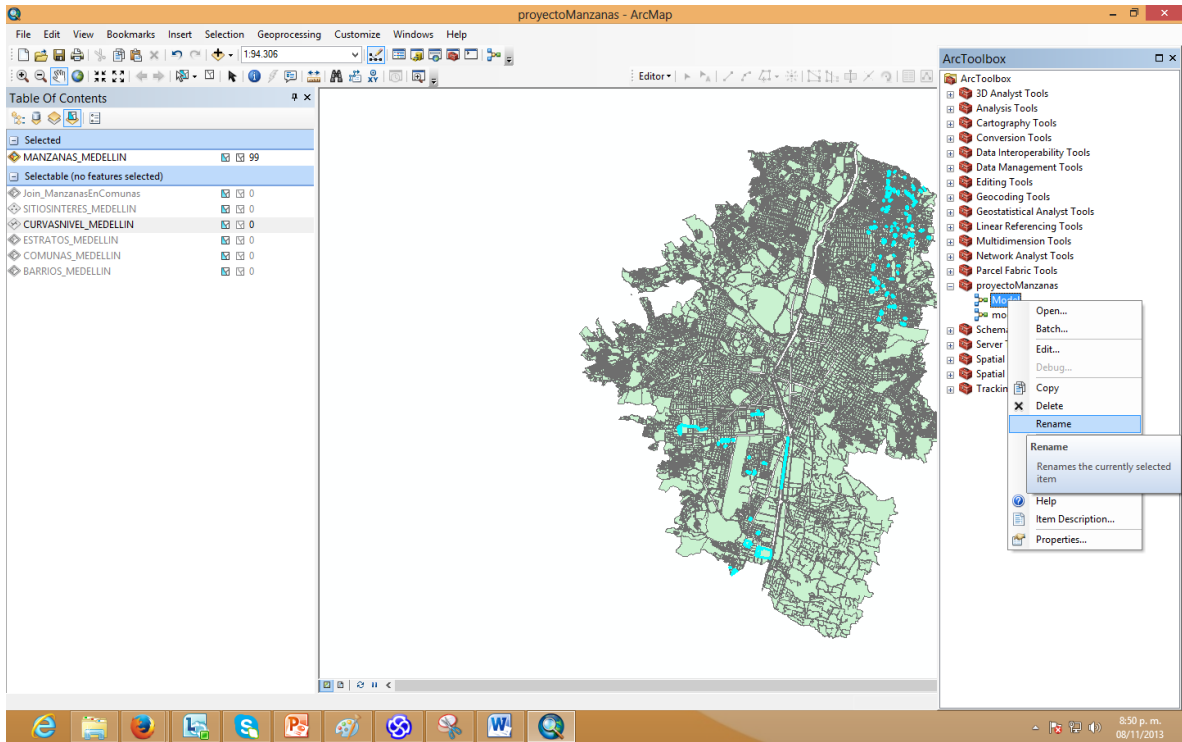






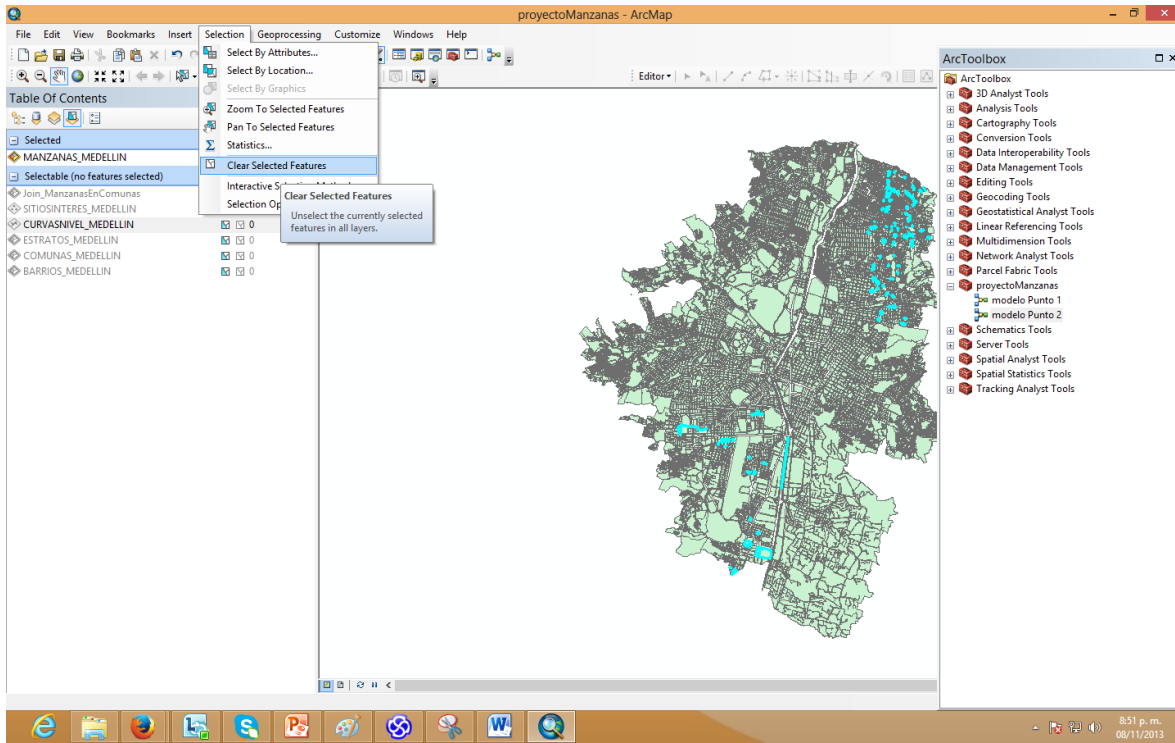


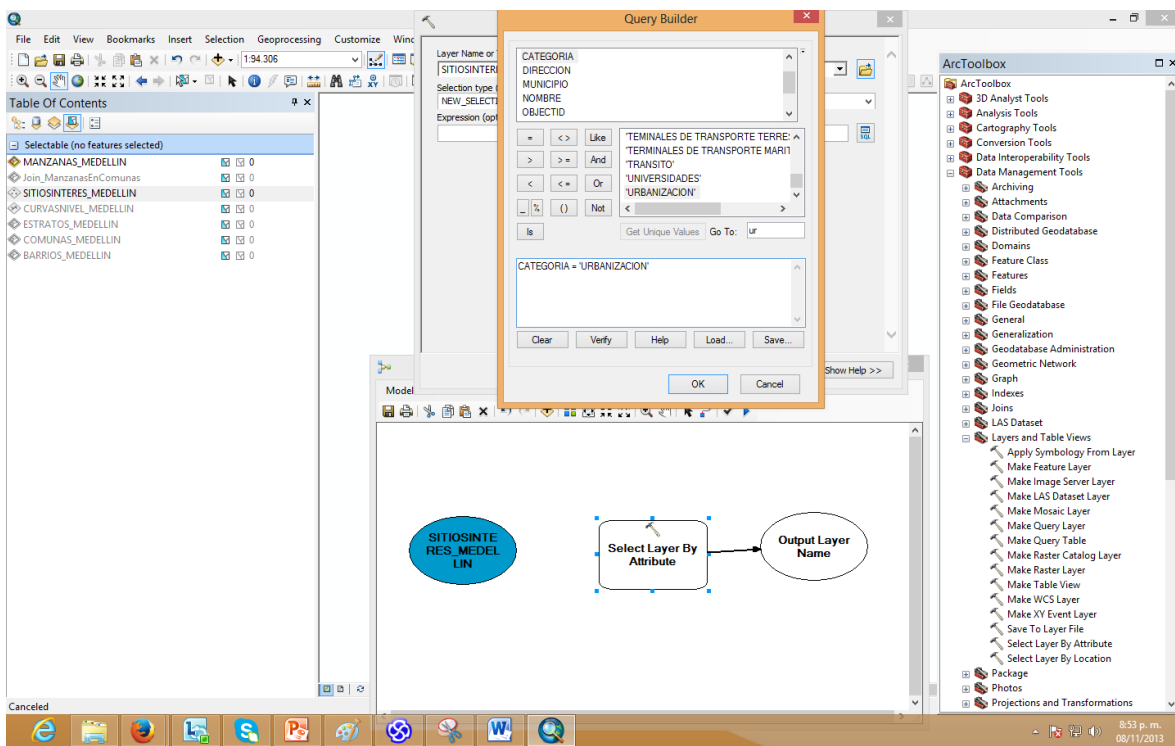
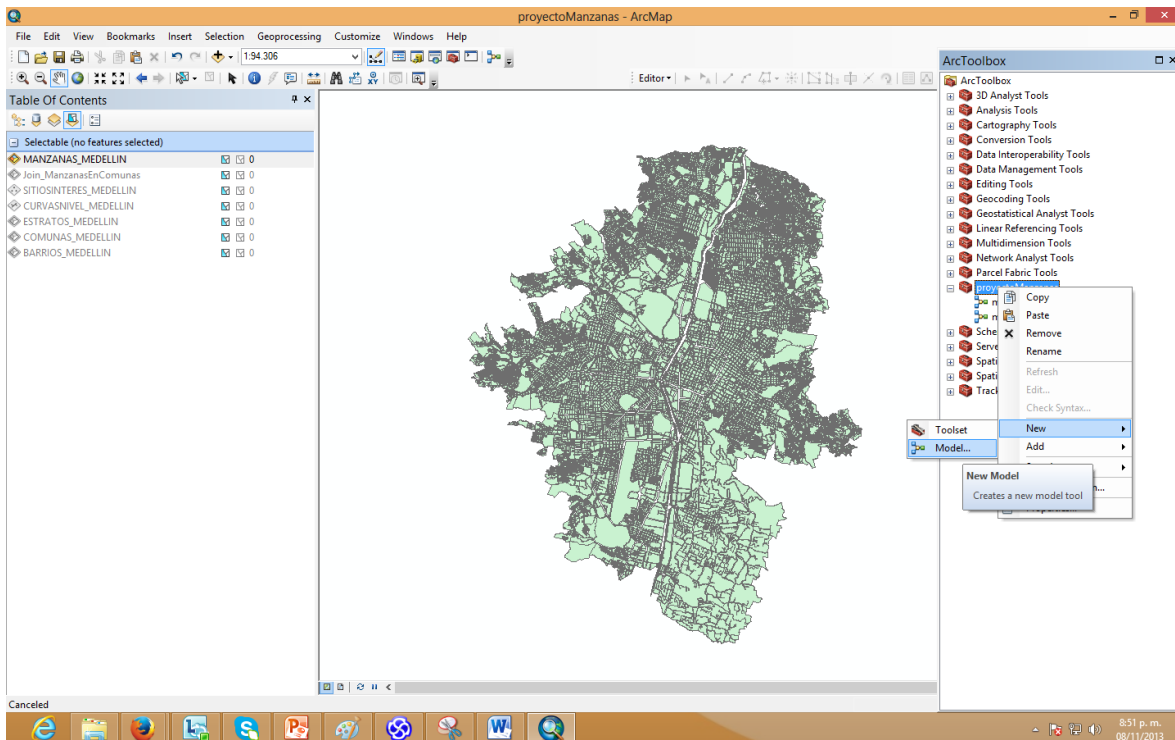


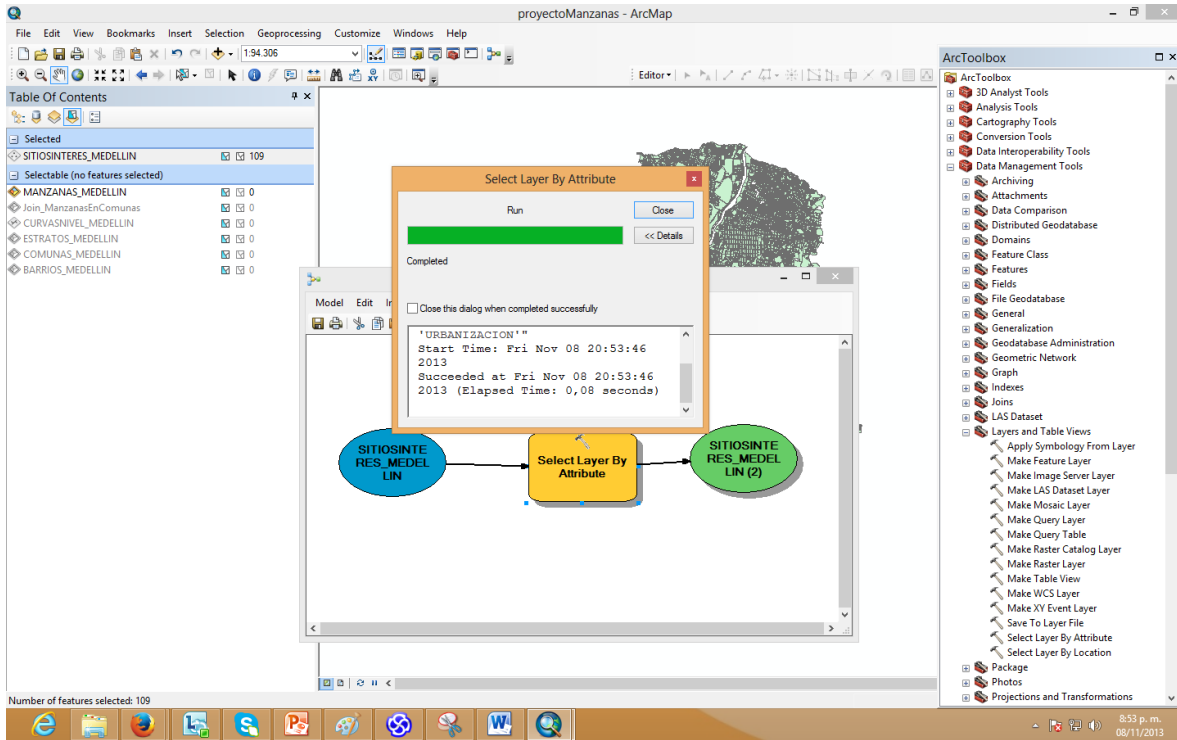
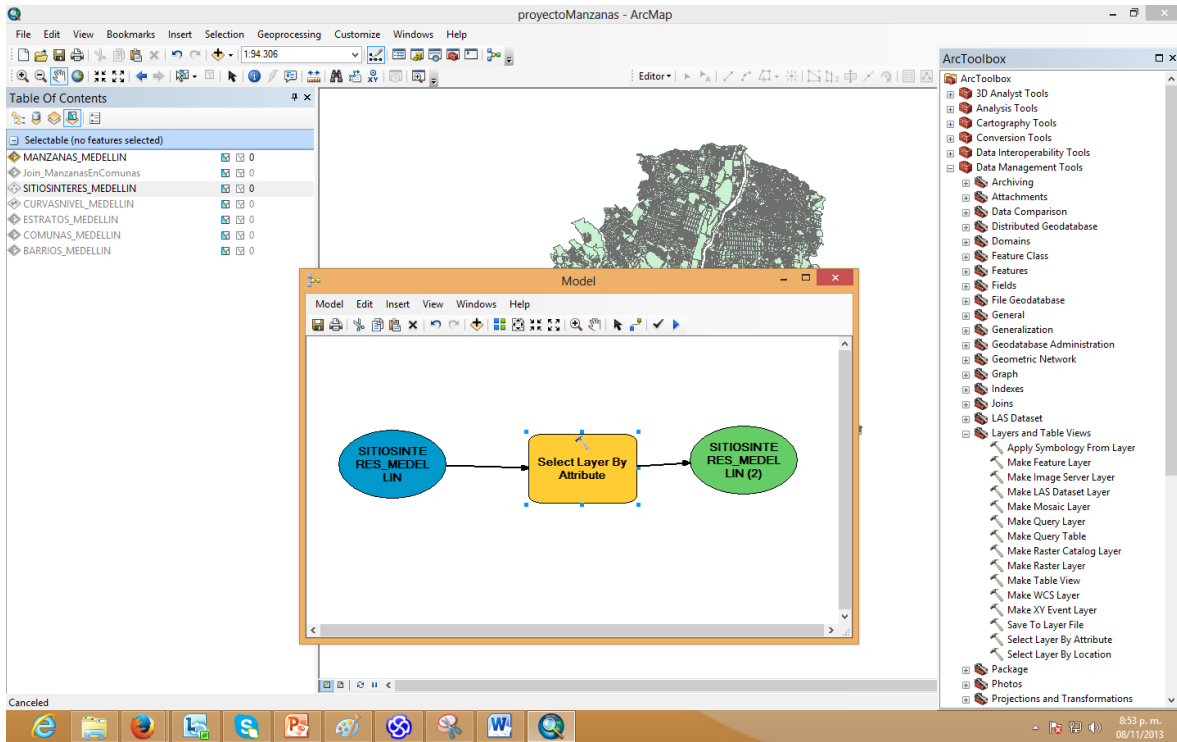


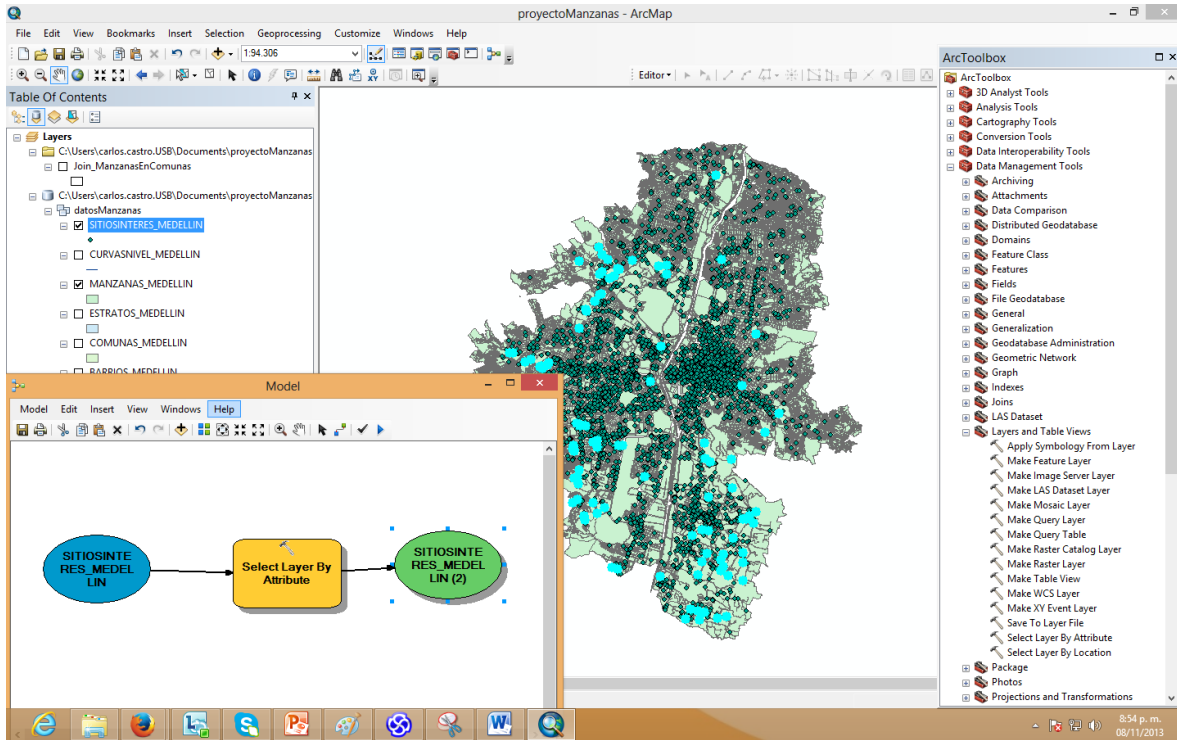
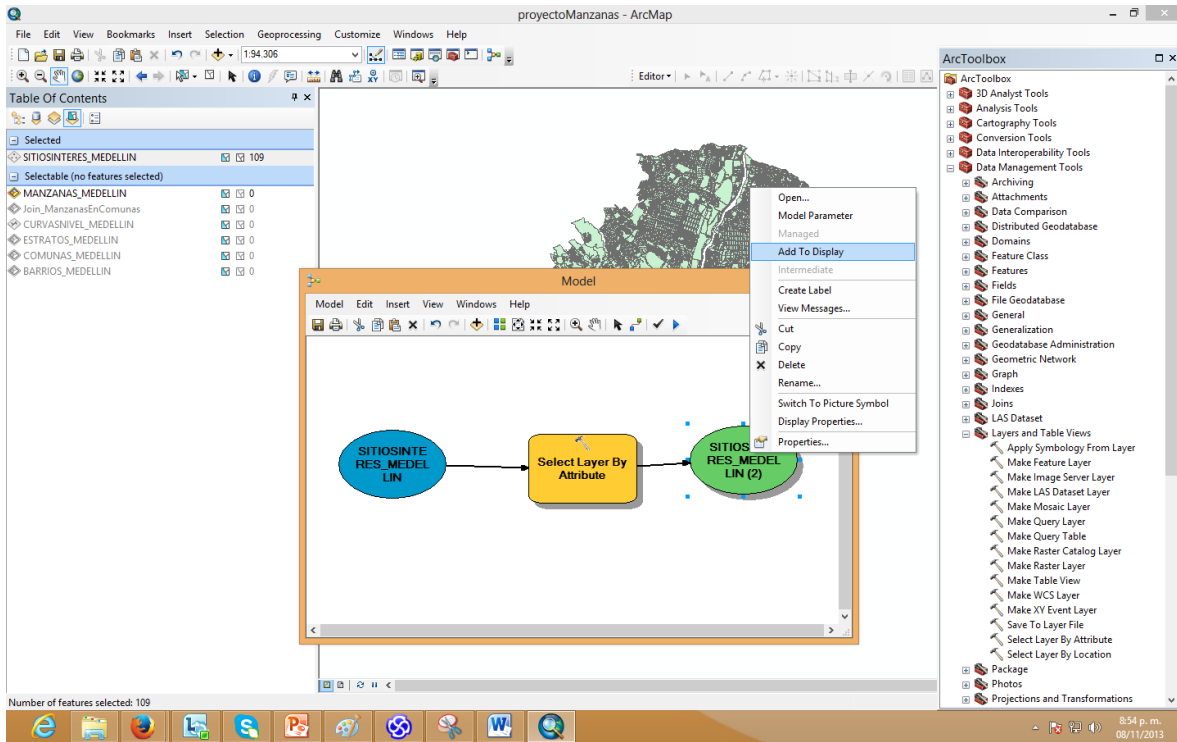


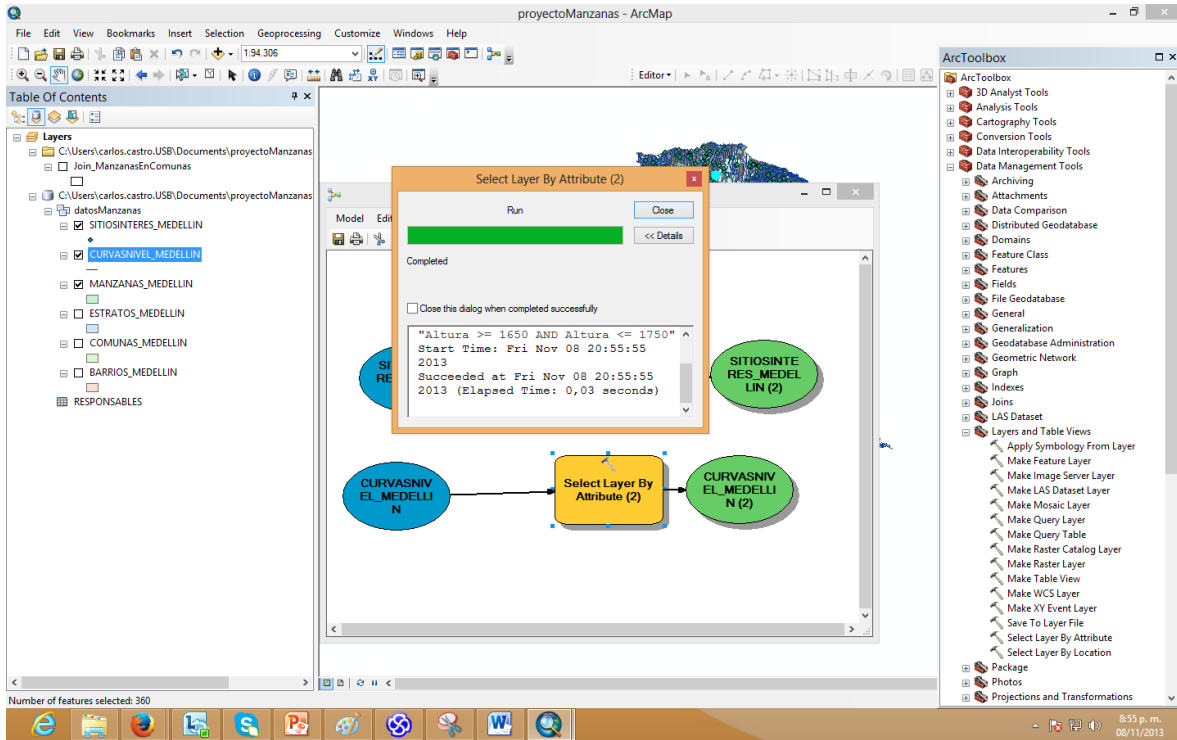
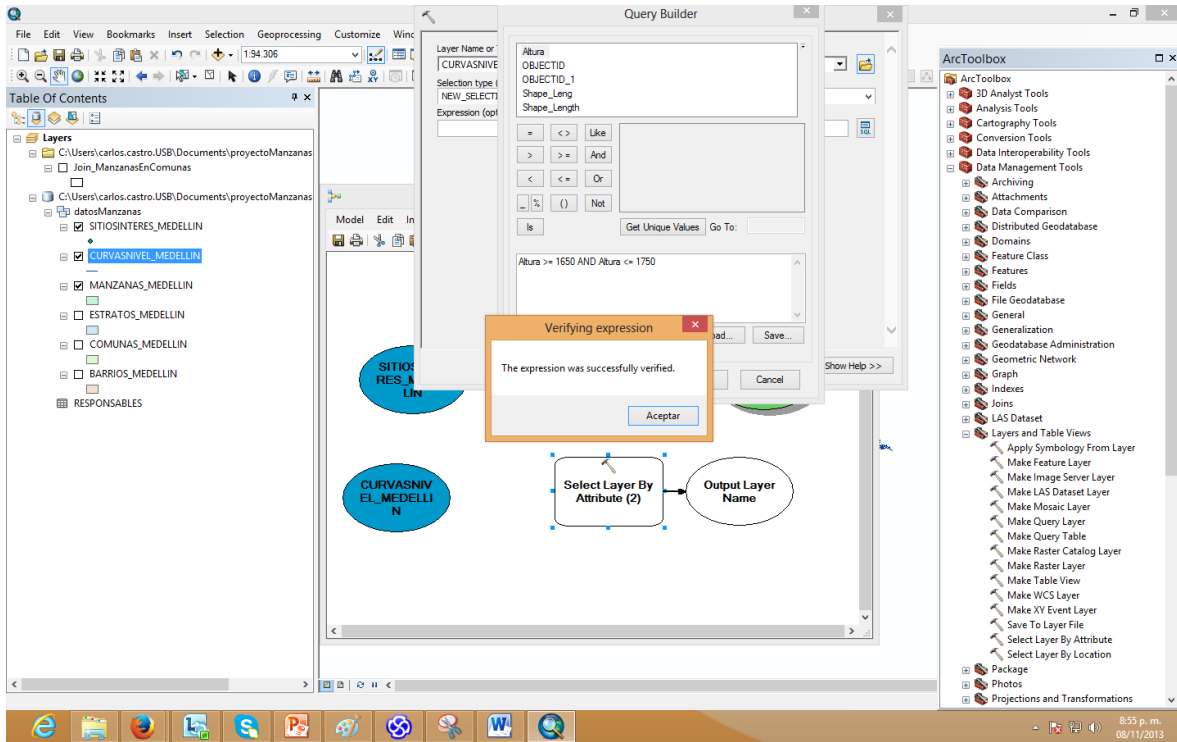
Mostrar Las Urbanizaciones que están a una distancia entre 2000 mt y 4000 mt de las Manzanas que están a una altura entre 1650 y 1750 metros y de las cuales son responsables 'Adelaida Morales Dejodas', 'Alejandro Villanueva Hervas', 'Alfonso Rodriguez Iglesias' ó 'Ana Gómez'.

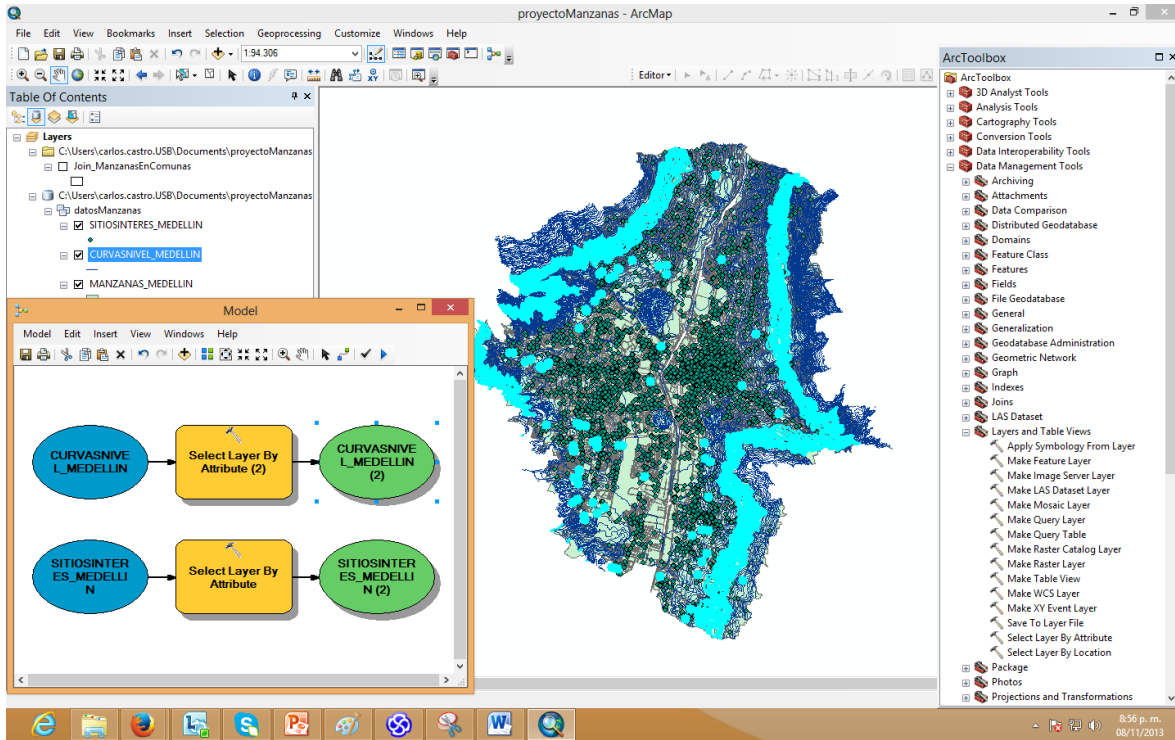
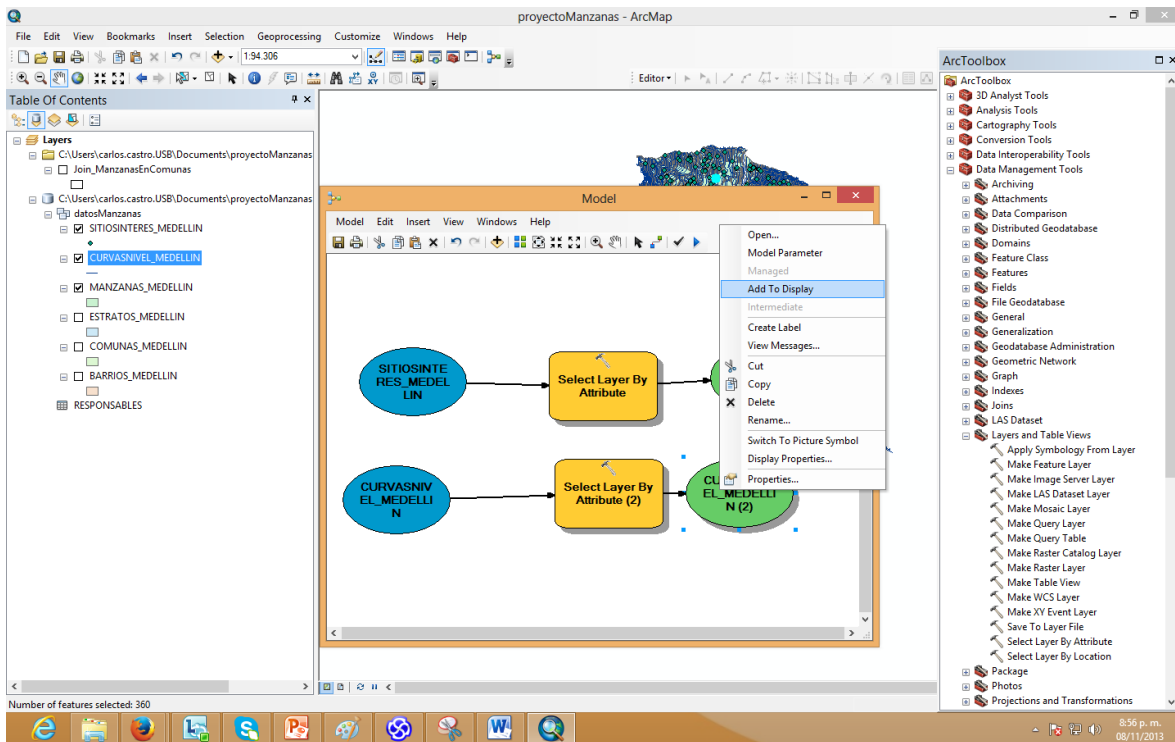


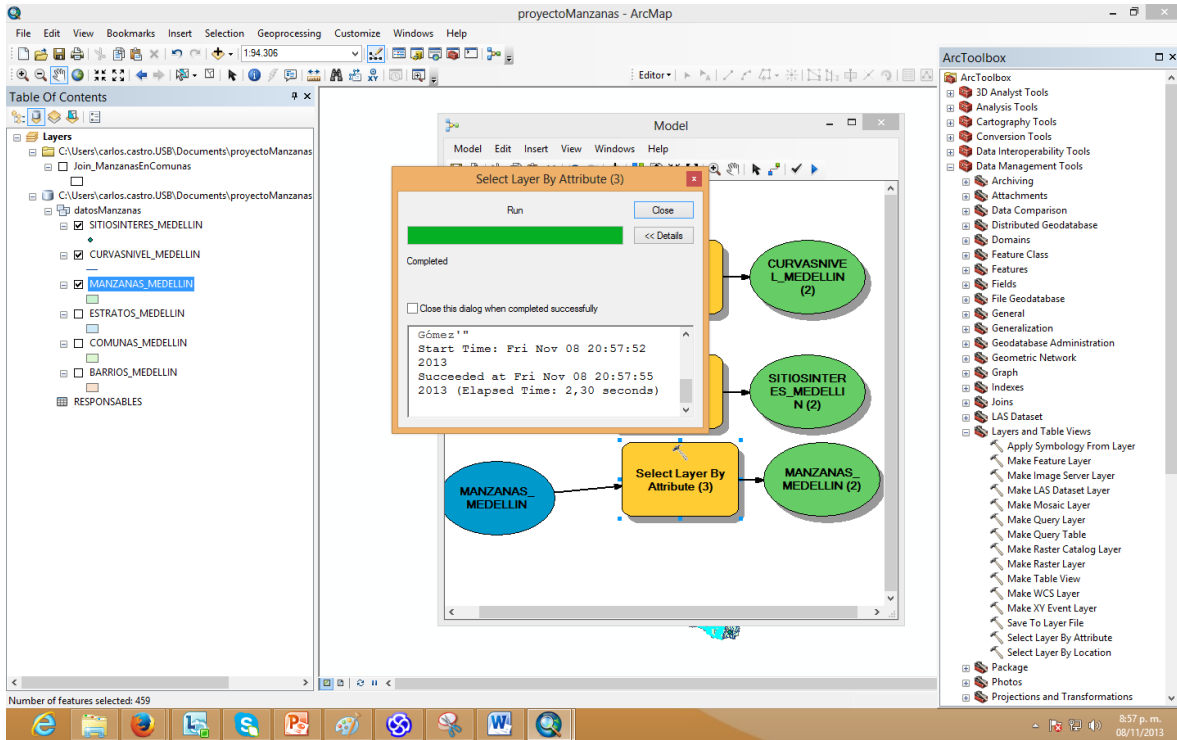
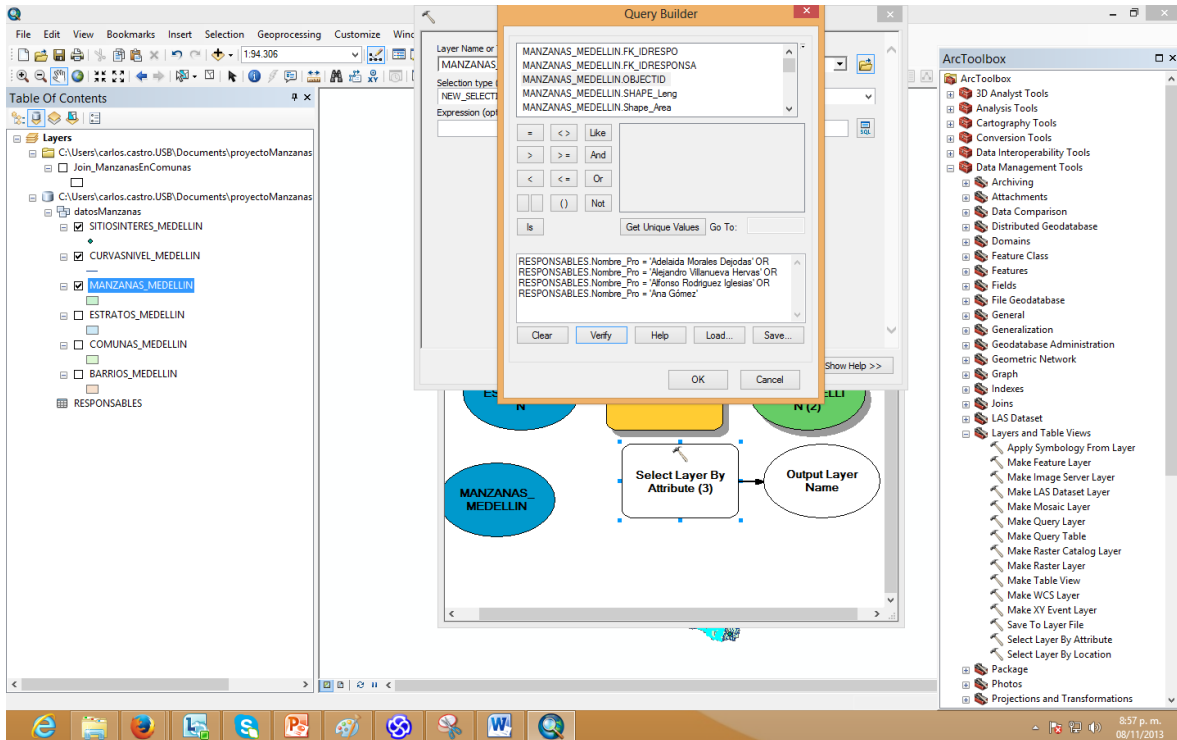


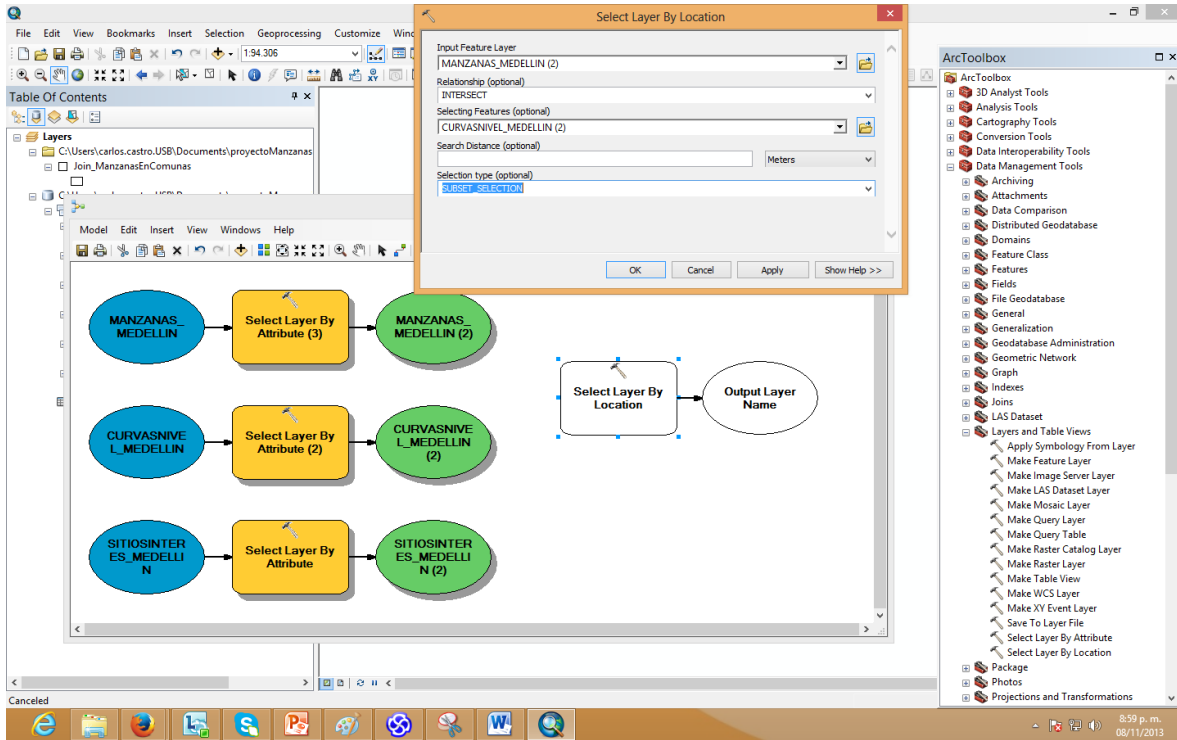
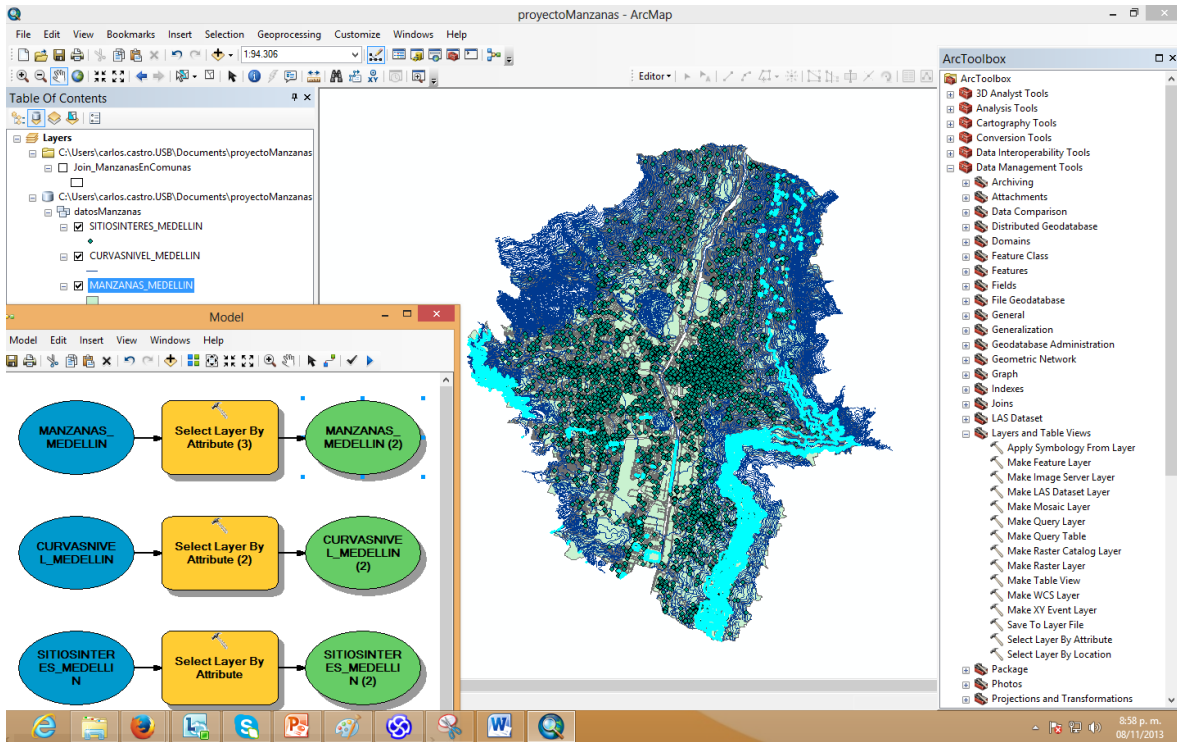




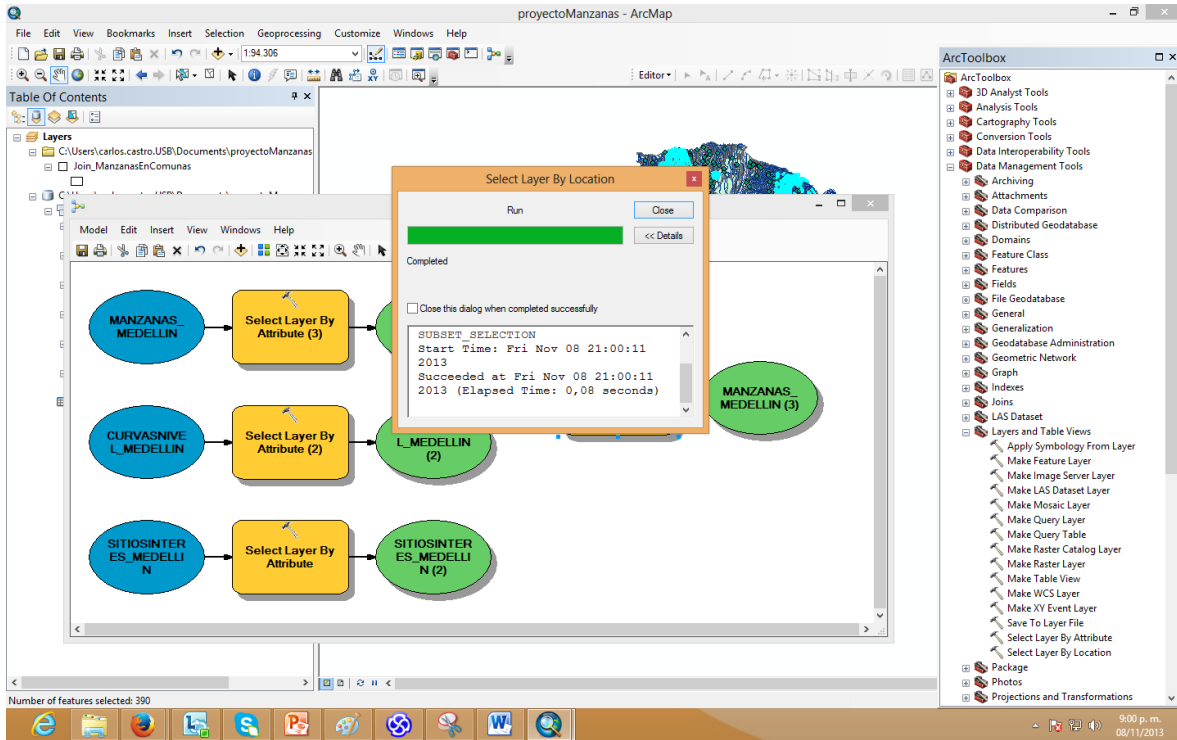
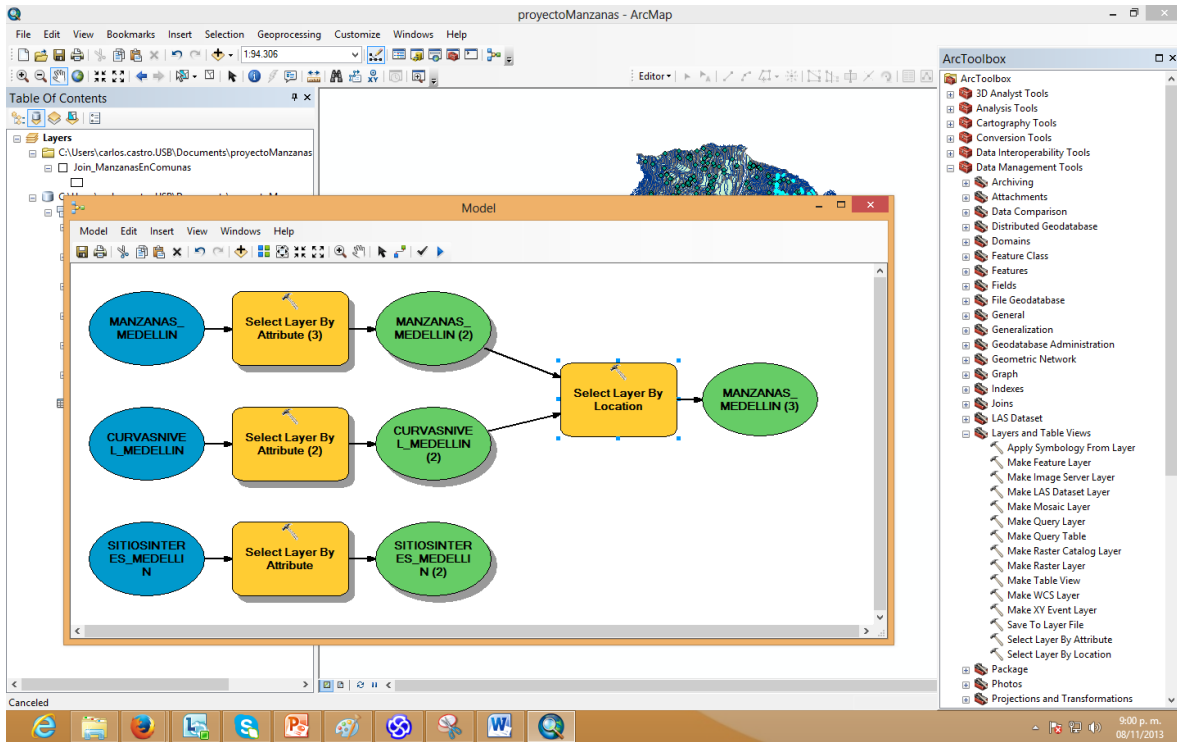


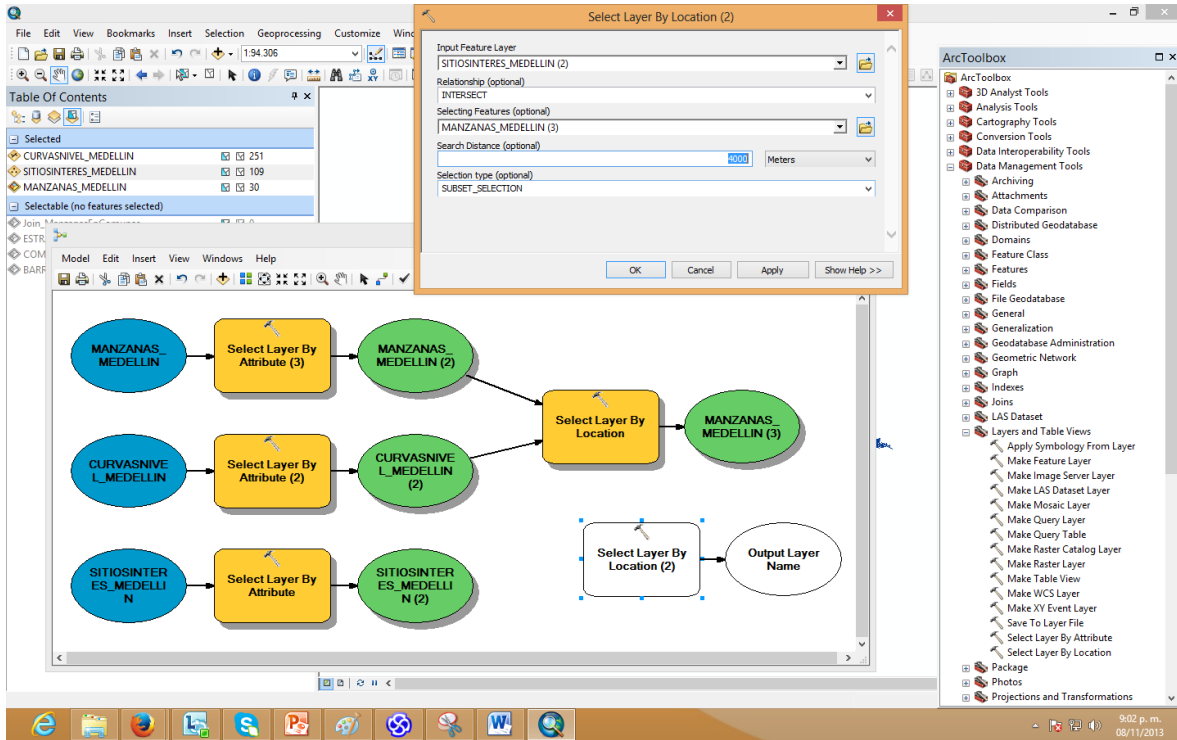
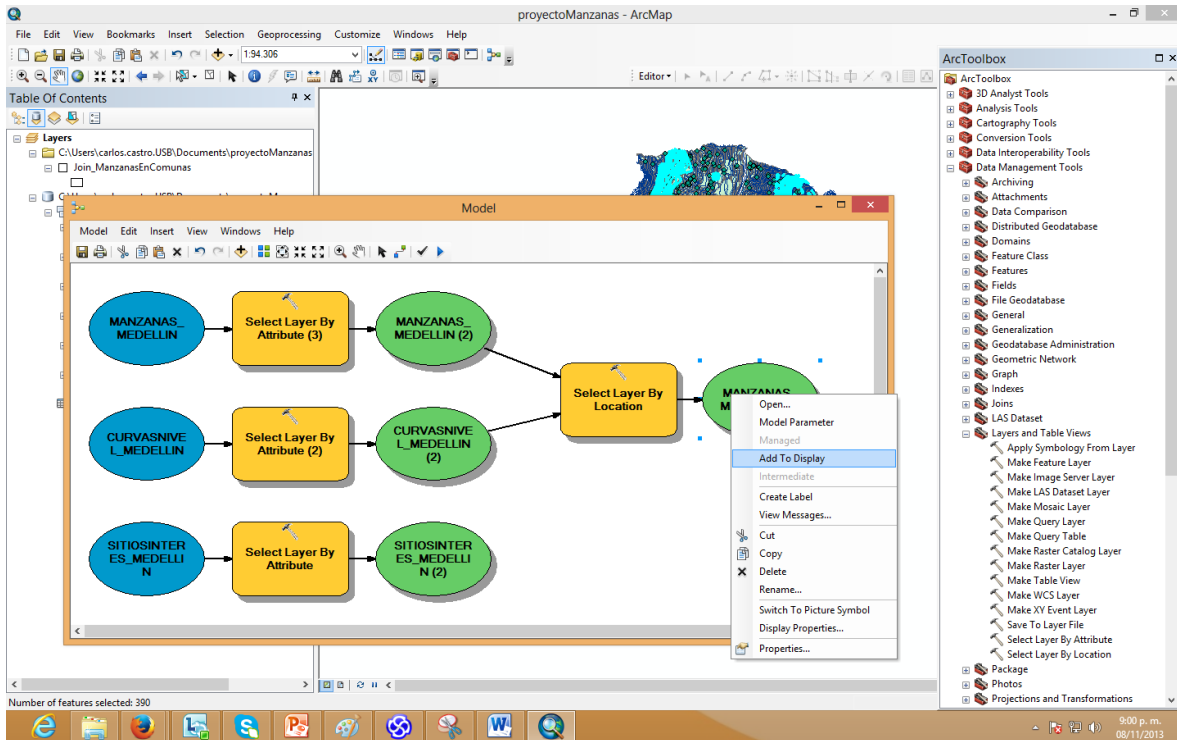


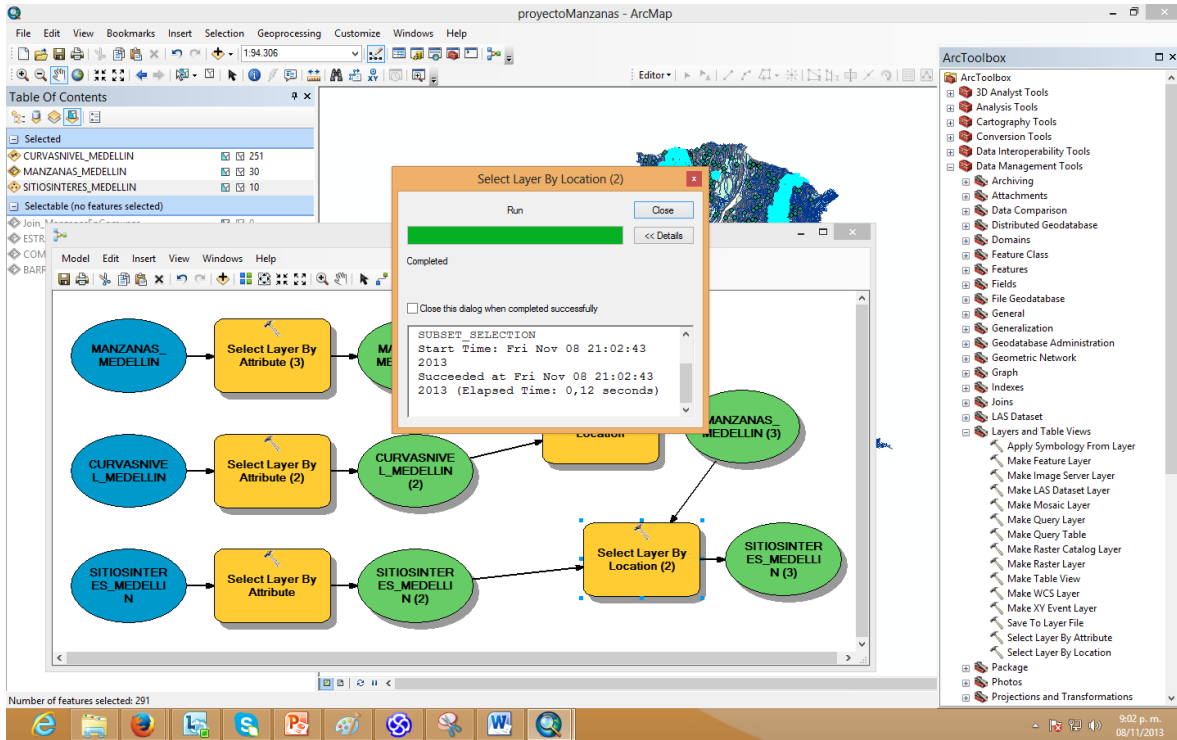
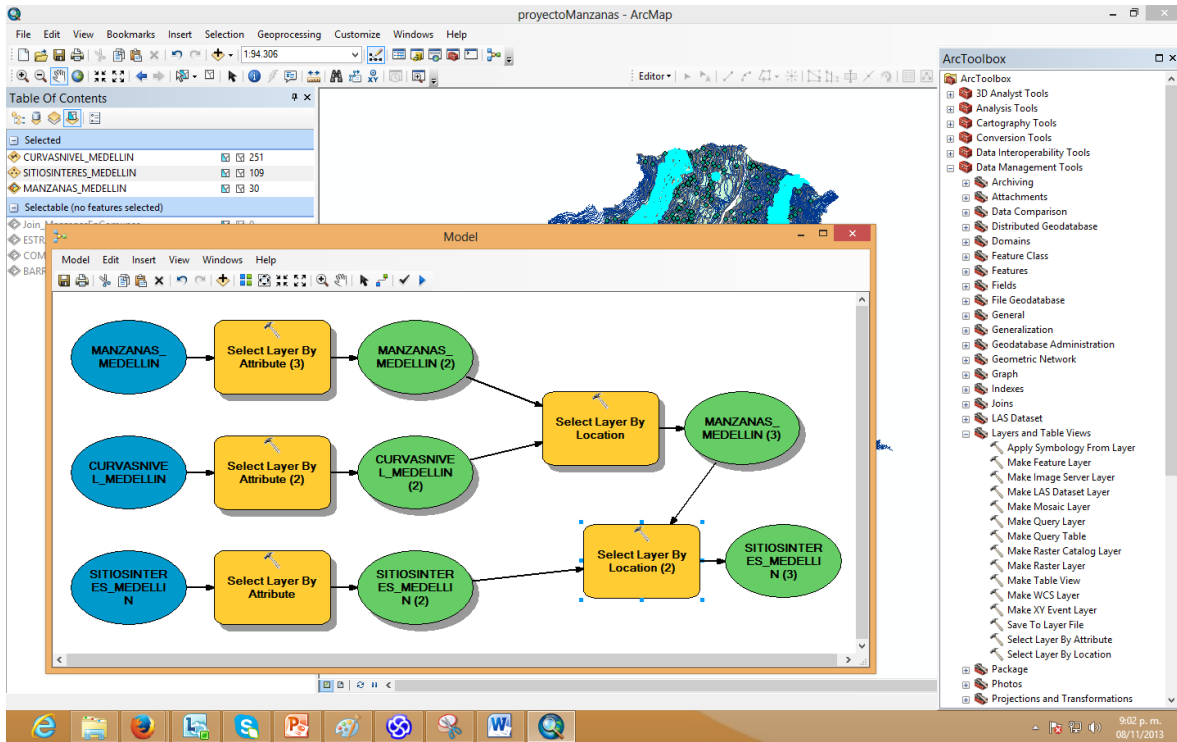






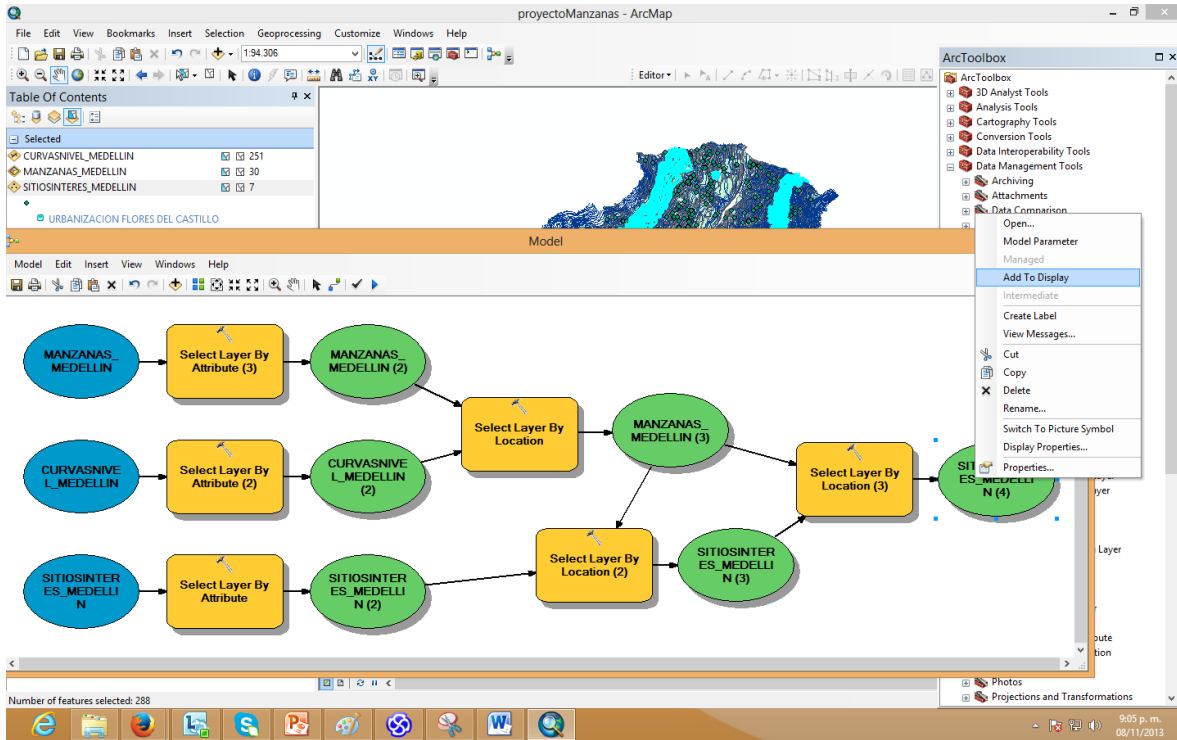
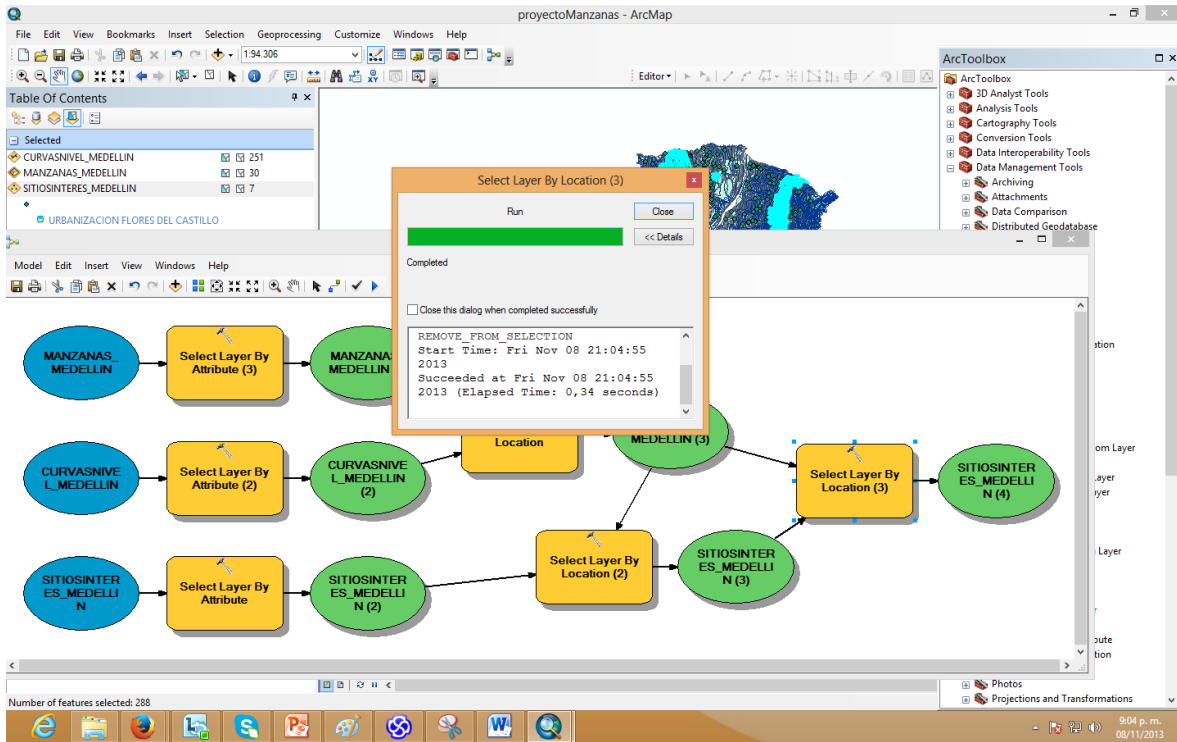


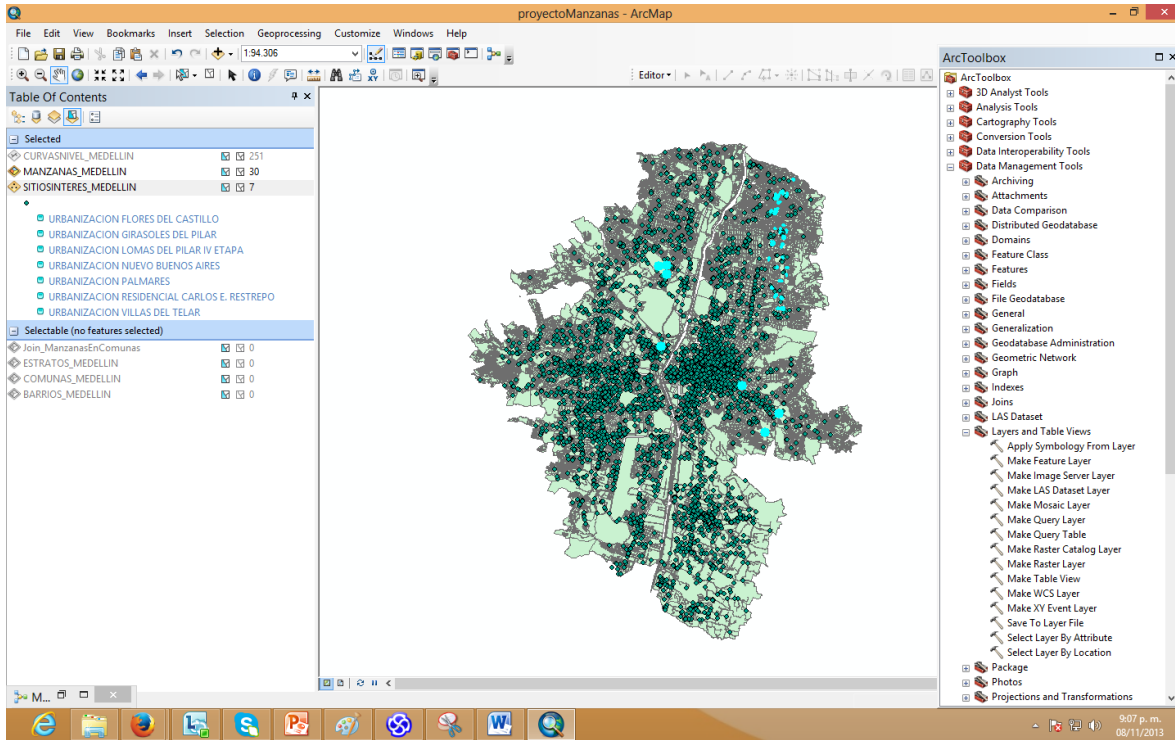
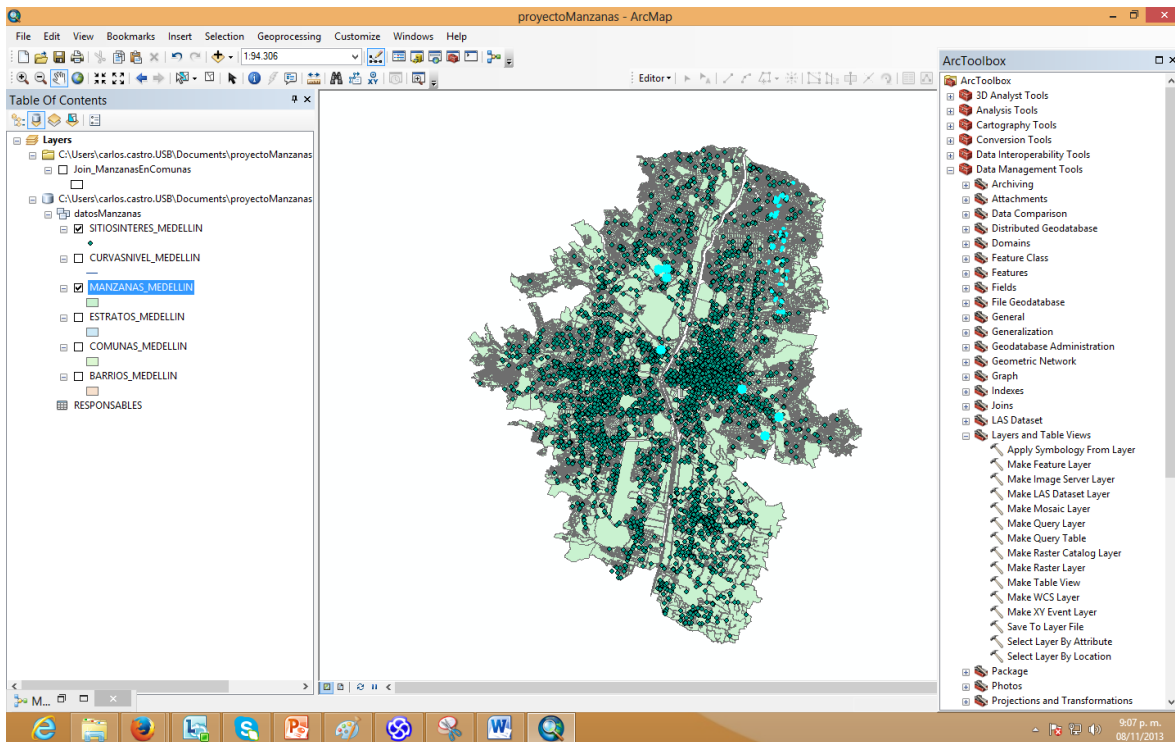


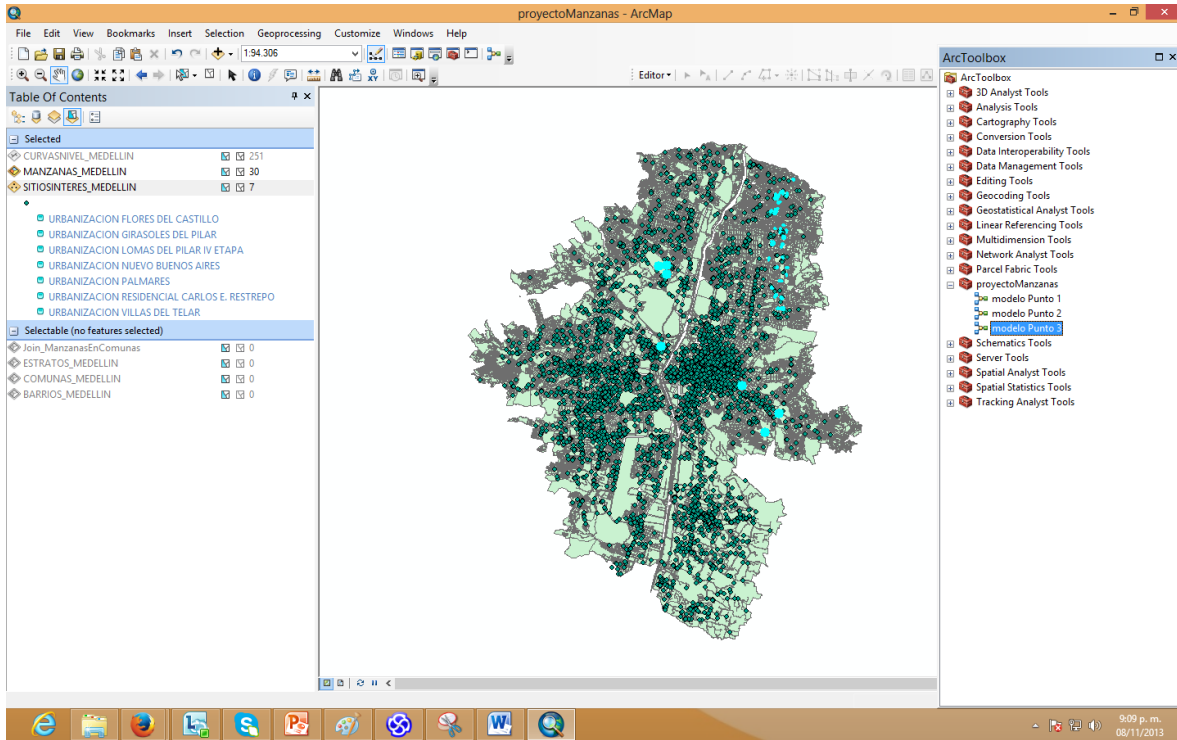
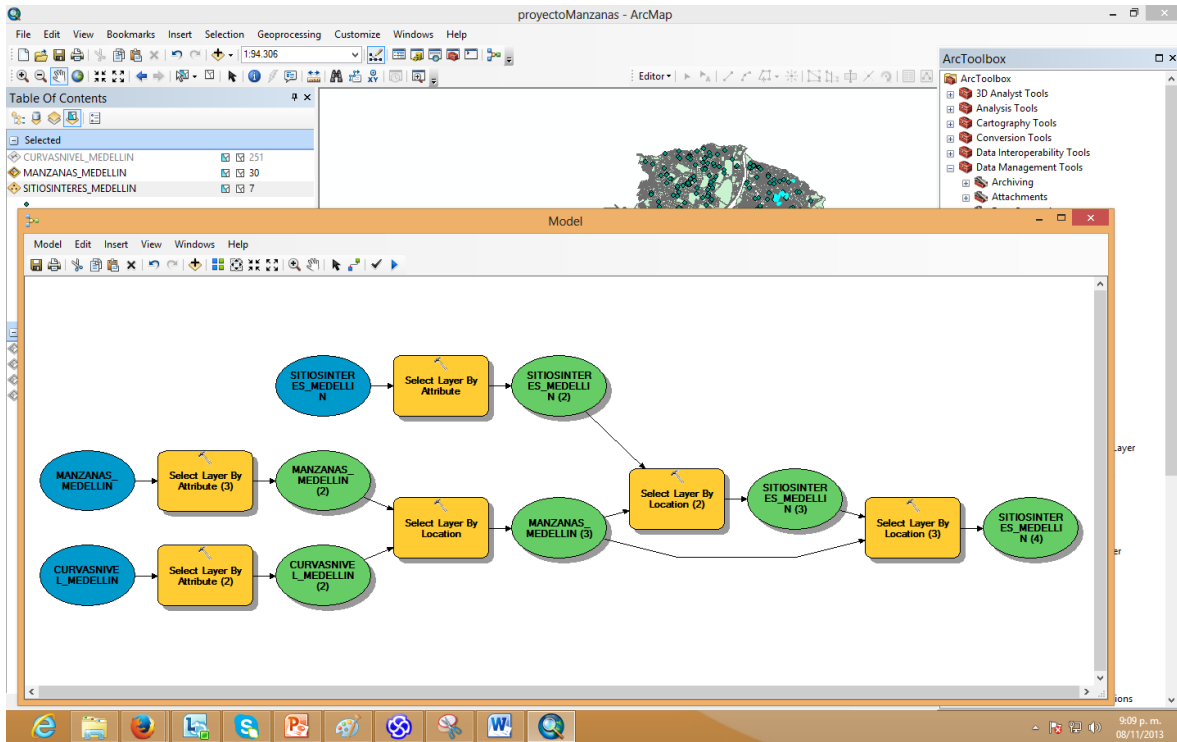


The top screenshot shows the ArcGIS interface with the 'Select Layer By Location (3)' dialog box open. The dialog box has the following settings: Input Feature Layer: SITIOSINTERES\_MEDELLIN (3); Relationship (optional): INTERSECT; Selecting Features (optional): MANZANAS\_MEDELLIN (3); Search Distance (optional): 2000 Meters; Selection type (optional): REMOVE\_FROM\_SELECTION. Below the dialog box is a flowchart diagram with three parallel paths. Each path starts with a blue oval (input layer), followed by a yellow rectangle ('Select Layer By Attribute'), then a green oval (intermediate layer), and finally a yellow rectangle ('Select Layer By Location'). The paths converge into a final yellow rectangle ('Select Layer By Location') which points to a white oval ('Output Layer Name').

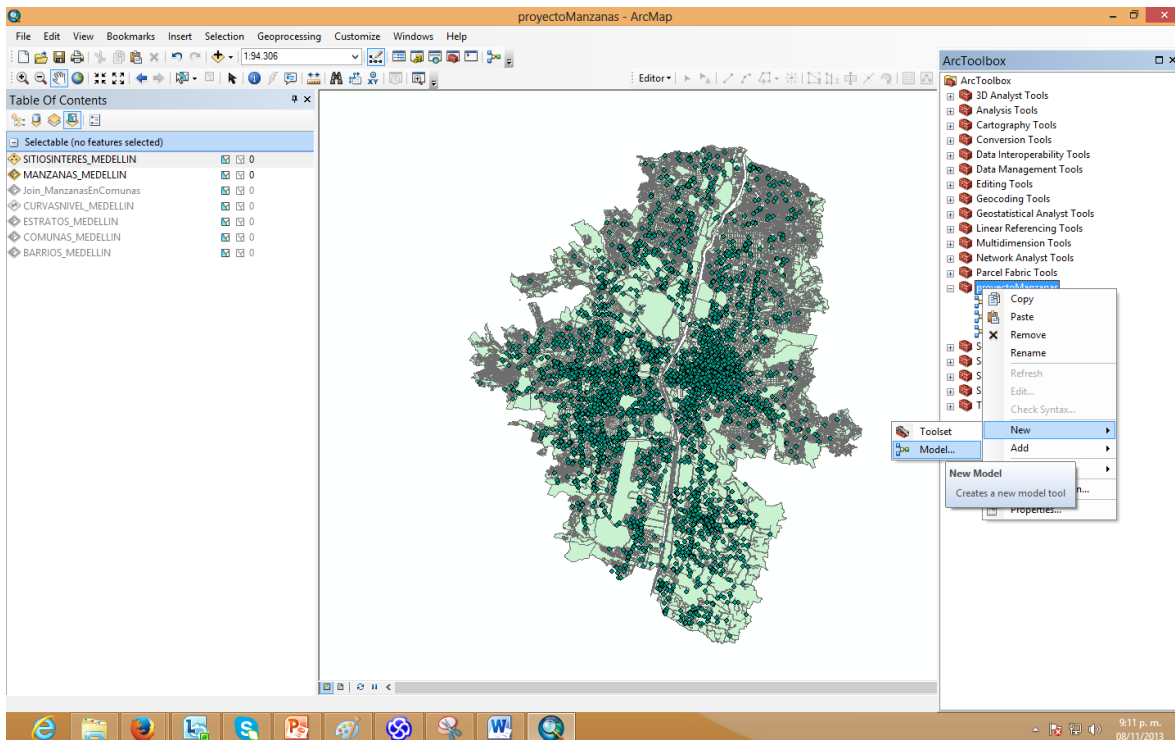
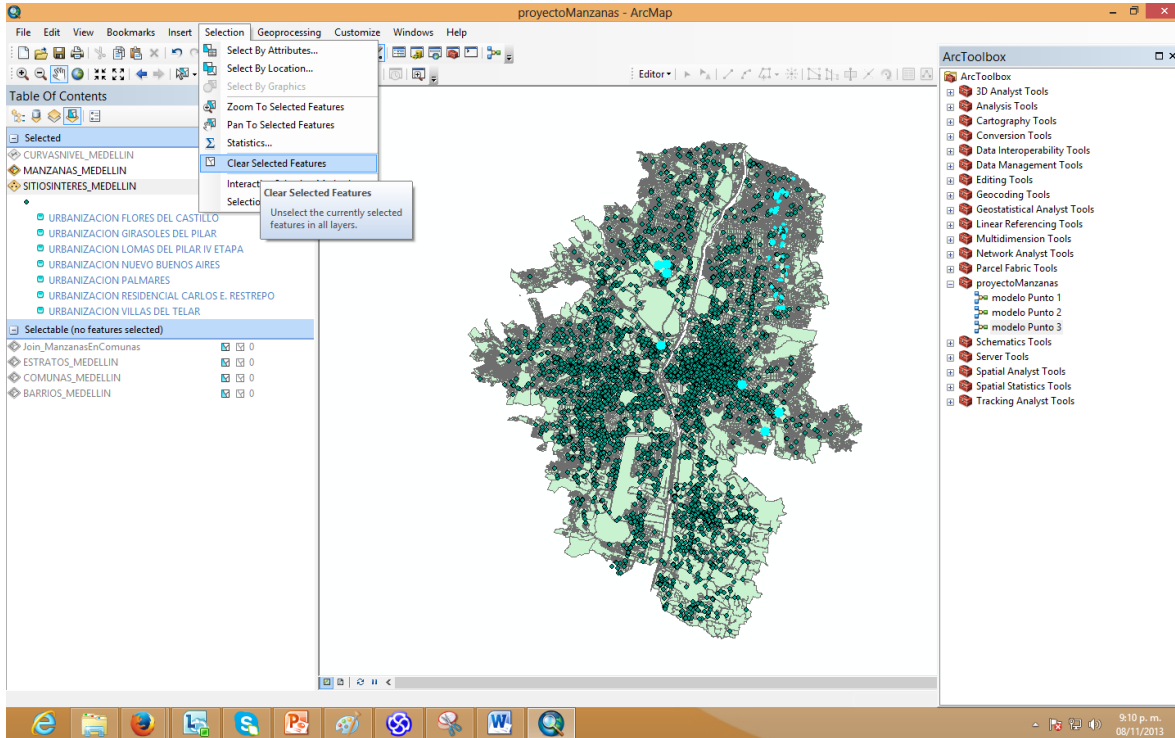
The bottom screenshot shows the ArcGIS interface with a map view displaying cyan highlights on a terrain map. Below the map is an updated flowchart diagram. It follows the same structure as the first diagram but includes an additional step: a final yellow rectangle ('Select Layer By Location (3)') that receives input from the intermediate layers and points to a final green oval ('SITIOSINTERES\_MEDELLIN (4)').



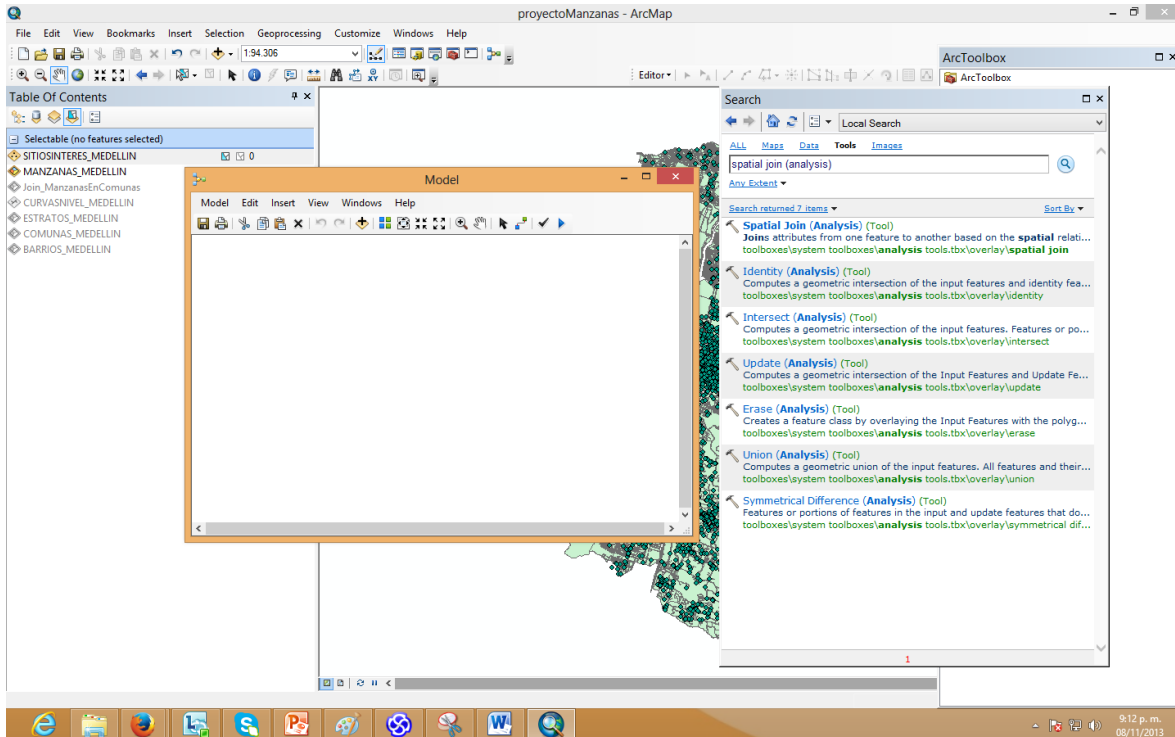
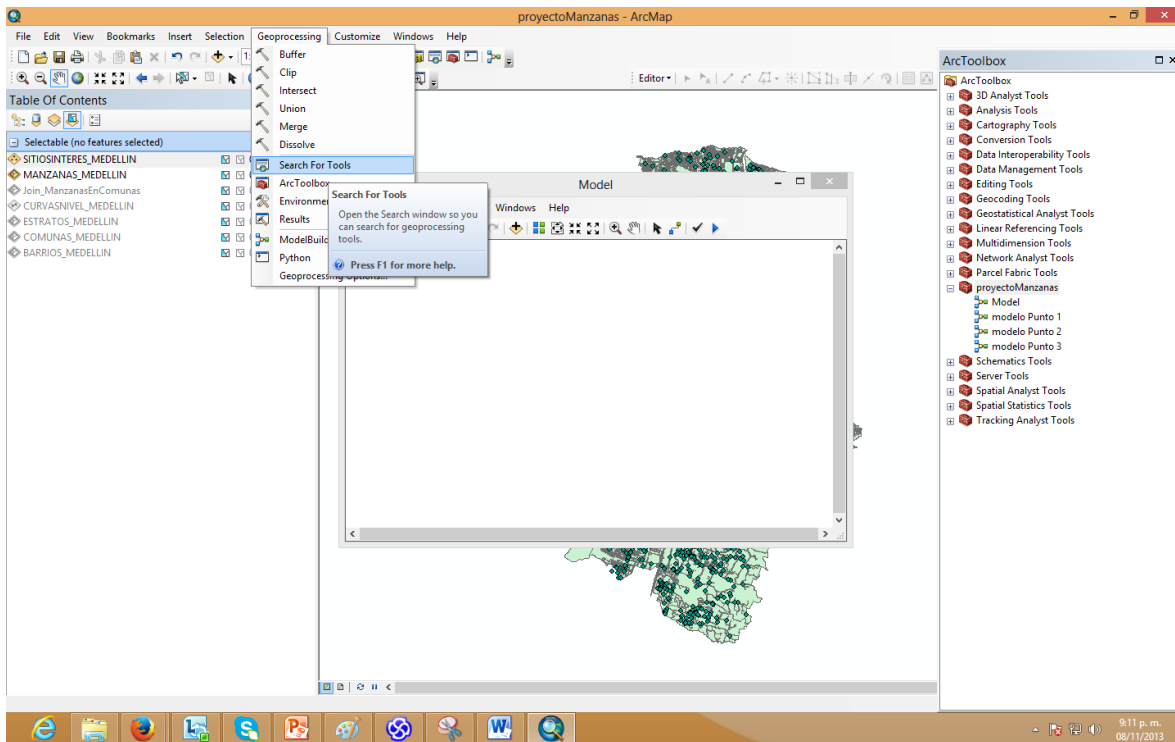




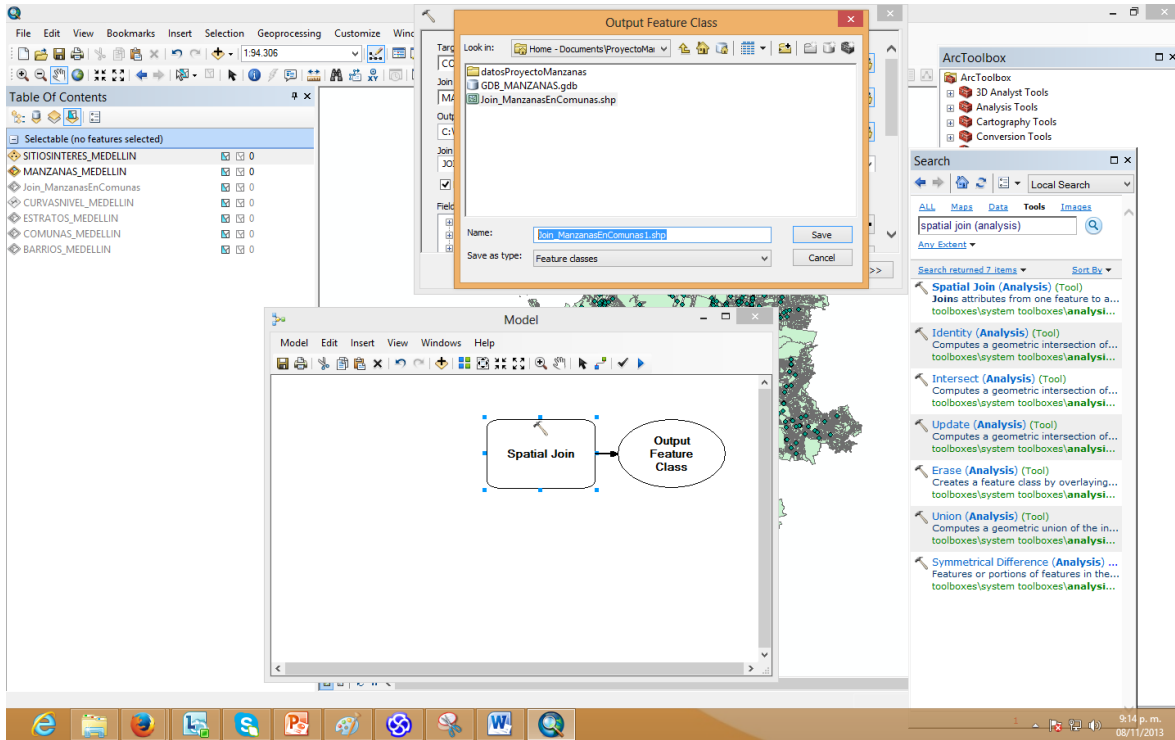
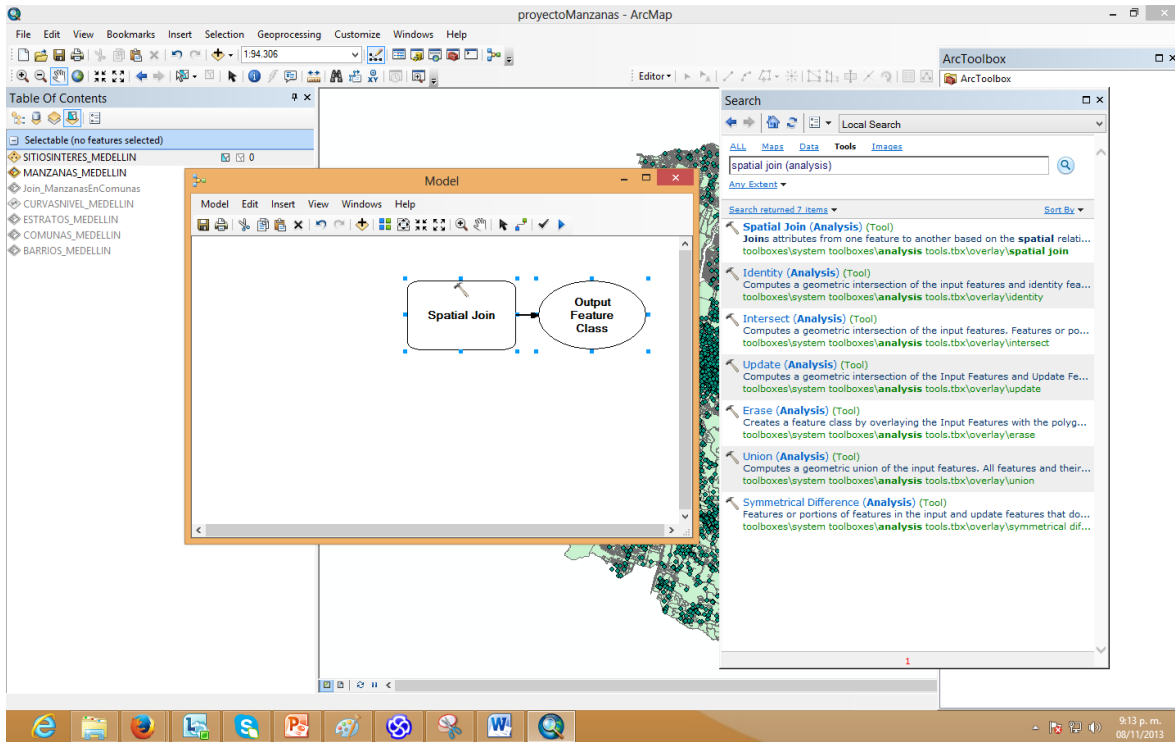
Mostrar las comunas, con el número de Manzanas de cada comuna, que tienen barrios con áreas mayores que 1'000.000 metros cuadrados

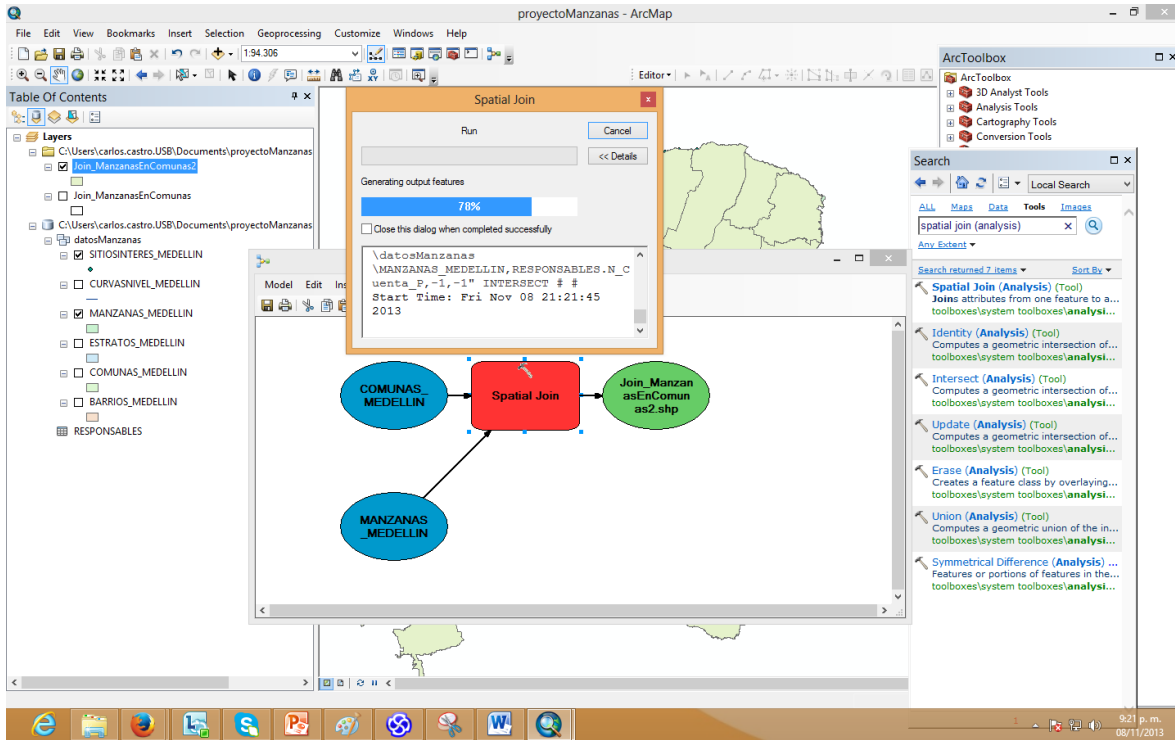
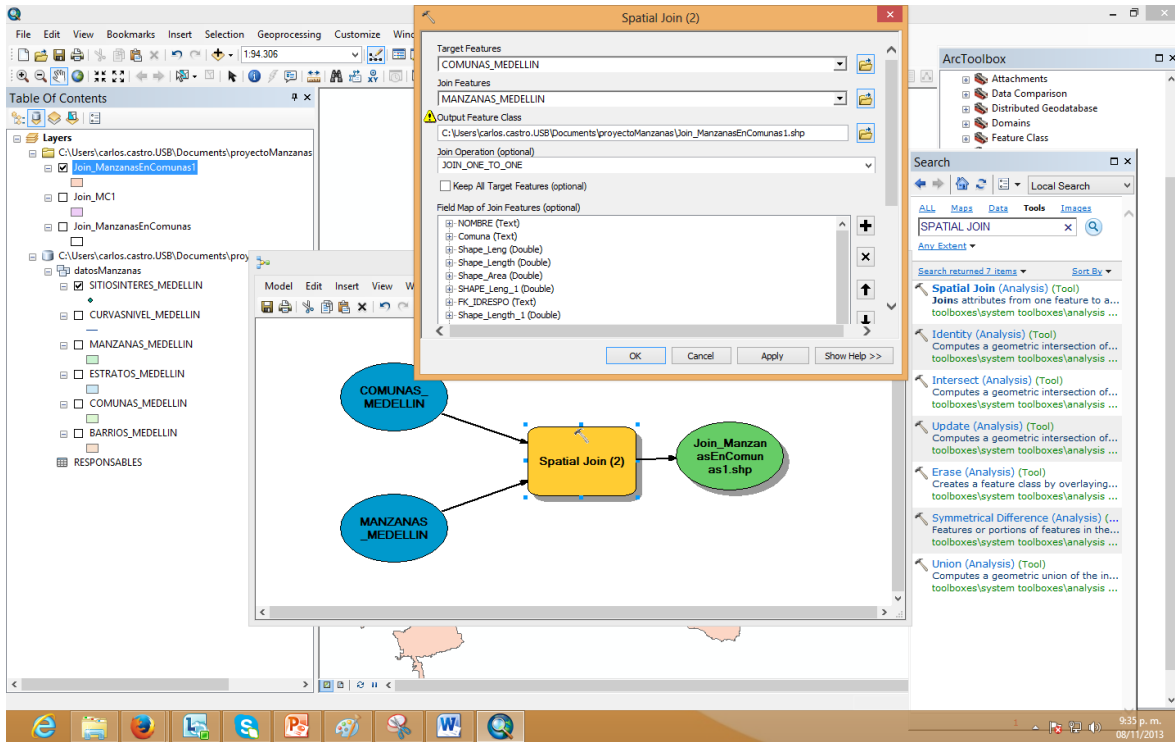


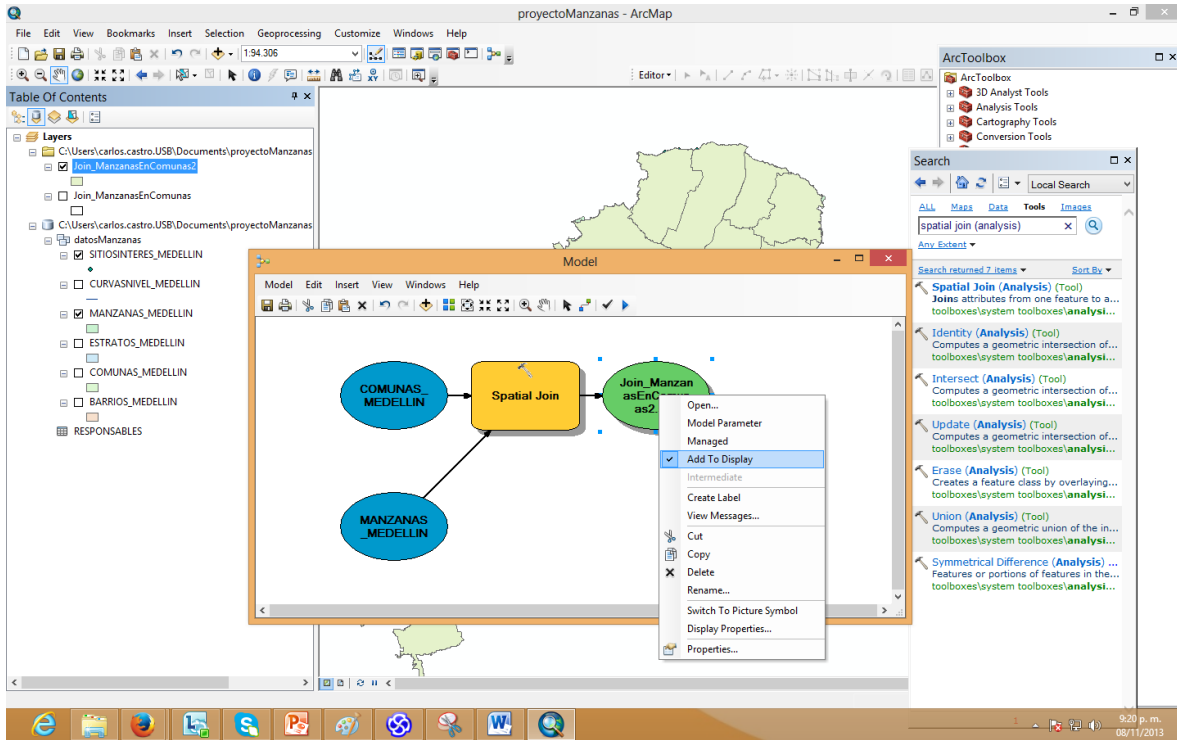
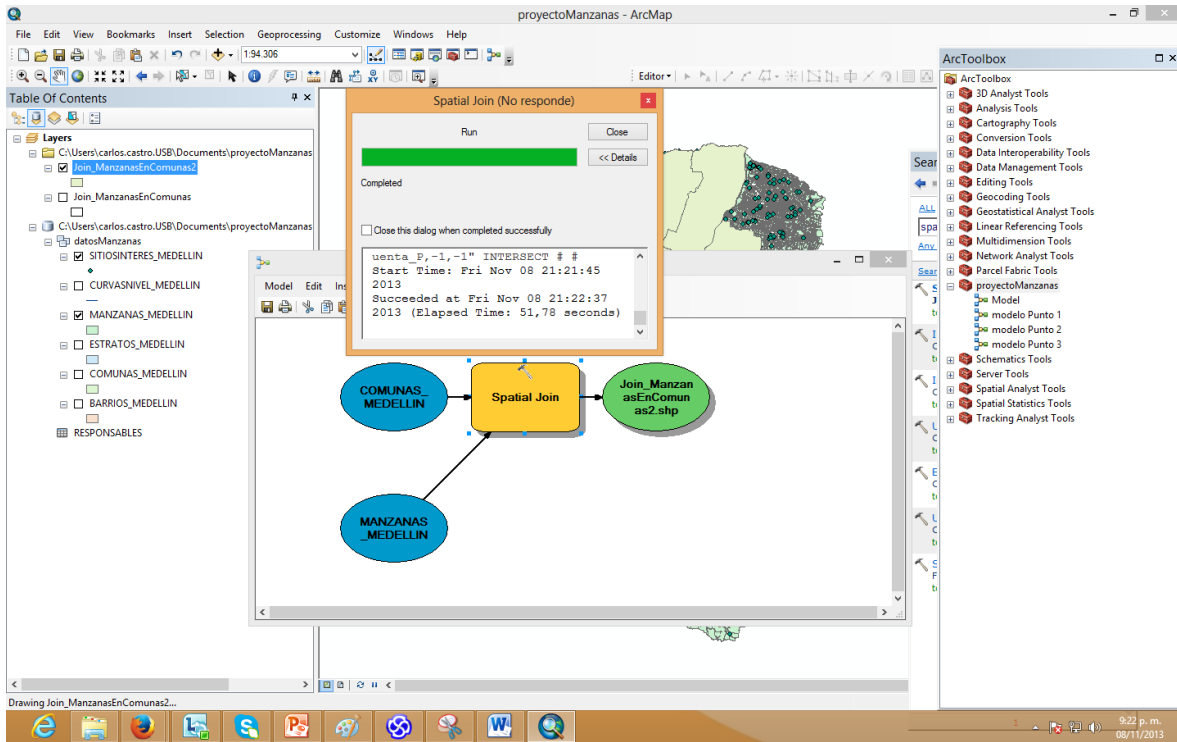




ARRASTRAR SPATIAL JOIN DESDE EL SEARCH







The screenshot shows the ArcGIS Desktop interface with a table of joined polygons. The table has the following columns: FID, Shape, Join\_Count, TARGET\_FID, NOMBRE, Comuna, Shape\_Length, Shape\_Area, and Shape\_Area. The data is as follows:

FID	Shape	Join_Count	TARGET_FID	NOMBRE	Comuna	Shape_Length	Shape_Area	Shape_Area
0	Polygon	2	1	Cañilla	05	16120.052739	16120.052733	6061750.22719
1	Polygon	912	2	Doce de Octubre	06	10756.74049	10756.740394	3964515.97367
2	Polygon	881	3	Robledo	07	23398.752661	23398.752124	9354673.1674
3	Polygon	552	4	Aranjuez	04	9796.008326	9796.008284	4883513.11201
4	Polygon	729	5	La Candelaria	10	13946.369554	13946.369552	7384025.16937
5	Polygon	641	6	Laureles - Estadio	11	15829.174608	15829.174599	7299544.11564
6	Polygon	729	7	Buenos Aires	09	18512.202241	18512.202156	6951251.92759
7	Polygon	797	8	Beñen	16	25355.699352	25355.699361	8854432.55741
8	Polygon	335	9	El Poblado	14	20145.54619	20145.546077	14522427.9976
9	Polygon	0	10	Cabecera Carr. San Antonio de Prado	00	16555.449303	16555.449223	3781484.41484
10	Polygon	2	11	Cabecera Carr. San Cristóbal	80	6866.317714	6866.317602	769588.462075
11	Polygon	580	12	Popular	01	10990.762021	10990.761892	3135455.91366
12	Polygon	331	13	Santa Cruz	02	8579.144896	8579.144798	2187254.30191
13	Polygon	482	14	Guayabal	15	13263.710829	13263.711198	7631584.56977
14	Polygon	638	15	Hanrique	03	12974.963746	12974.963837	5030138.33473
15	Polygon	721	16	Villa Hermosa	08	16683.364332	16683.364572	5760987.5791
16	Polygon	429	17	La America	12	15602.289723	15602.289923	4085555.44036
17	Polygon	629	18	San Javier	13	20650.752652	20650.753251	4485842.70707
18	Polygon	0	19					

The screenshot shows the ArcGIS Desktop interface with the 'Delete Field' dialog box open for the 'TARGET\_FID' column. The dialog box contains the following text:

Permanently deletes this field from the table. This command is disabled if you are currently editing this table or editing data that resides in the same geodatabase or folder. It is also disabled if write access can't be established to the geodatabase or folder the data resides in.

The screenshot shows the ArcGIS interface with a table titled "Join\_ManzanasEnComunas1". The table lists 19 manzanas with their respective commune names and geometric properties. The map view below the table shows the spatial distribution of these manzanas across a region.

ID	Shape	Join_Count	NOMBRE	Comuna	Shape_Length	Shape_Area
0	Polygon	816	Castilla	05	16120.852739	6051150.227119
1	Polygon	912	Doce de Octubre	06	10756.74049	3964515.97367
2	Polygon	881	Robledo	07	23398.752661	9354673.1674
3	Polygon	552	Aranjuez	04	9796.008326	4863513.11201
4	Polygon	729	La Candelaria	10	13846.360554	7354592.16087
5	Polygon	641	Laureles - Estadio	11	15829.174608	7299544.11564
6	Polygon	729	Buenos Aires	09	18512.202241	6051251.92759
7	Polygon	797	Beñan	16	25355.693652	8854432.65741
8	Polygon	335	El Poblado	14	20145.54619	14522427.9976
9	Polygon	0	Cabecera Carr. San Antonio de Prado	00	16555.449303	3781484.41484
10	Polygon	2	Cabecera Carr. San Cristobal	60	6866.317714	760568.462075
11	Polygon	580	Popular	01	10090.792021	3135455.91366
12	Polygon	331	Santa Cruz	02	8579.144896	2187254.30191
13	Polygon	482	Guayabal	15	13263.710829	7631584.56977
14	Polygon	638	Manrique	03	12974.963746	5030138.32473
15	Polygon	721	Villa Hermosa	08	16683.364332	5760887.5791
16	Polygon	429	La America	12	15602.289723	4085555.44038
17	Polygon	629	San Javier	13	20850.752652	4488842.70707
18	Polygon	43	San Javier	13	5334.592281	306224.763095

The screenshot shows the same ArcGIS interface as above, but with a "Statistics of Join\_ManzanasEnComunas1" dialog box open. The dialog displays a frequency distribution histogram for the "Join\_Count" field. The histogram shows the distribution of join counts across the 19 manzanas, with a peak around 500-600.

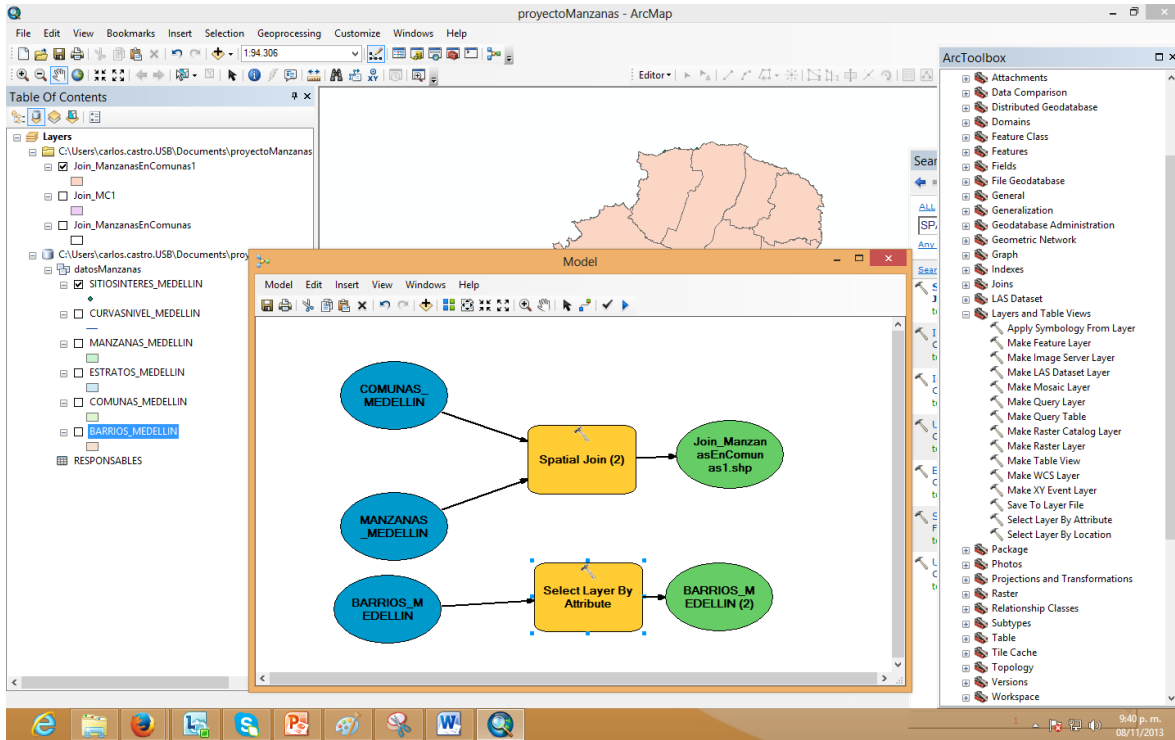
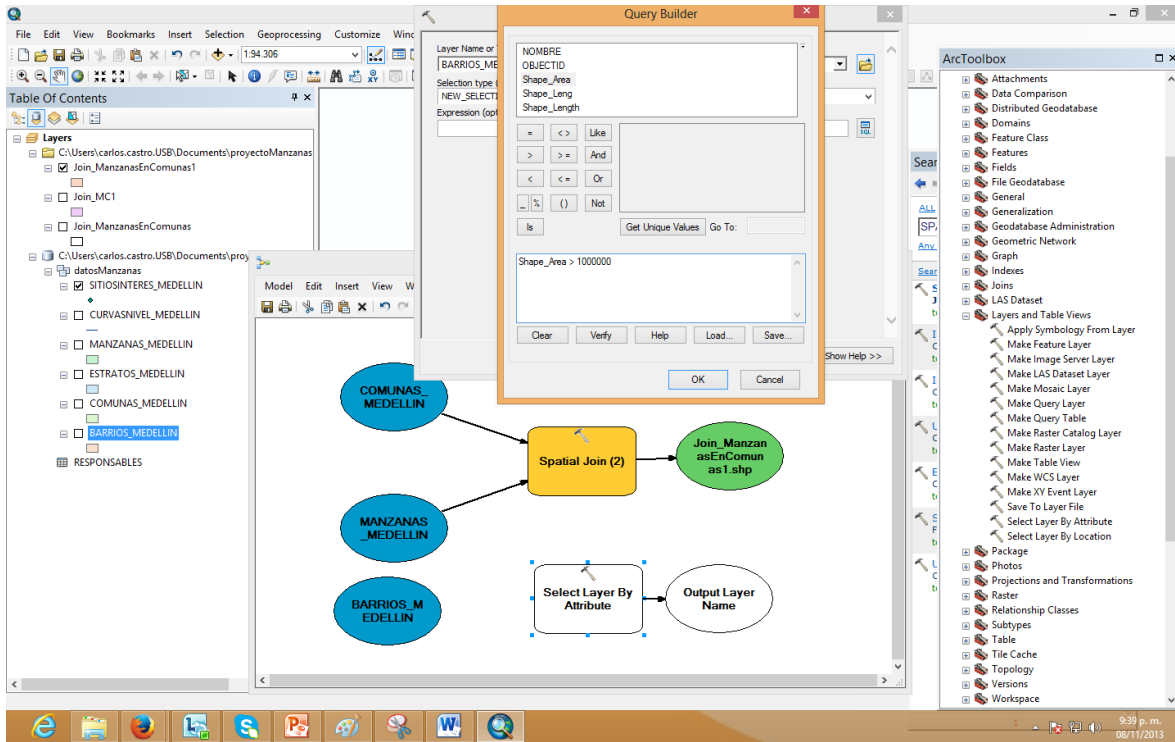
Field: Join\_Count

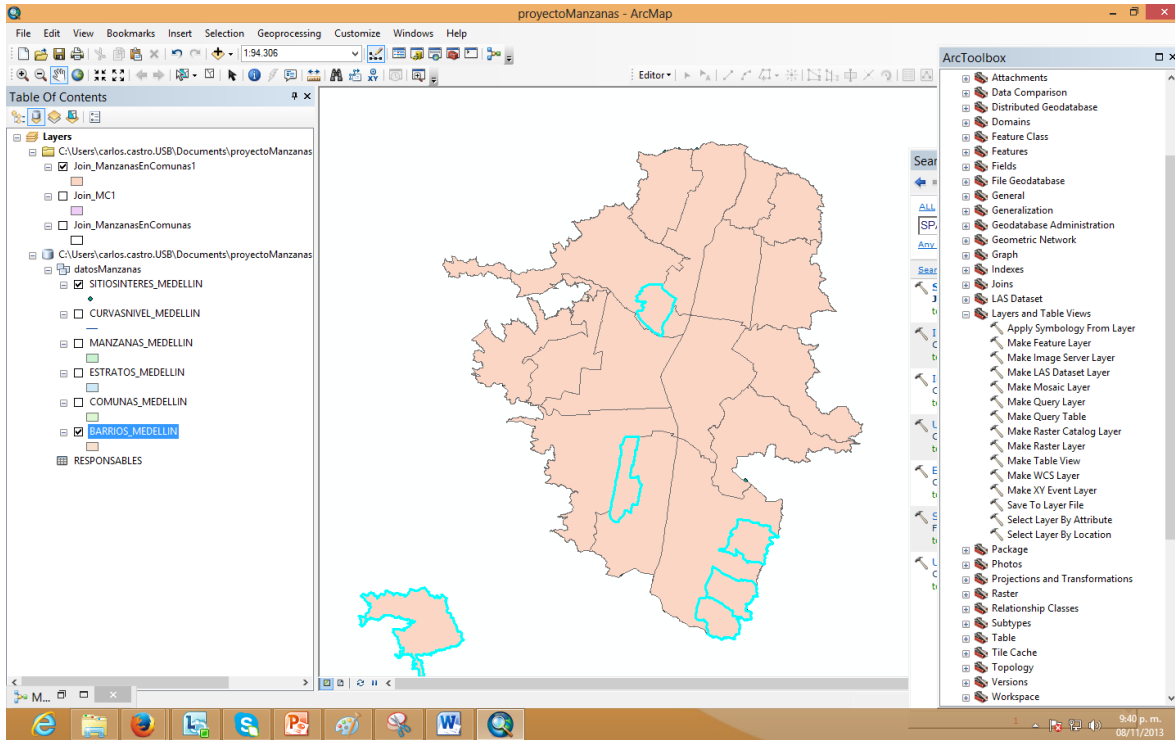
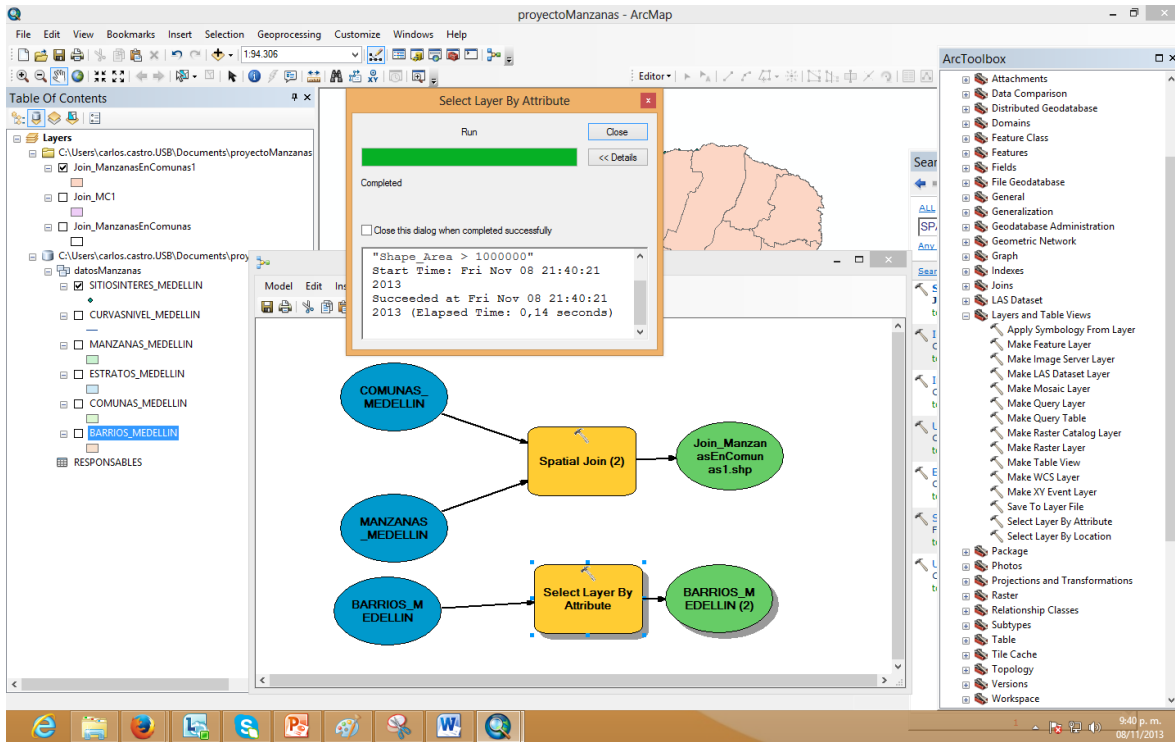
Statistics:

- Count: 19
- Minimum: 0
- Maximum: 912
- Sum: 10044
- Mean: 528.631579
- Standard Deviation: 270.090279
- Nulls: 0

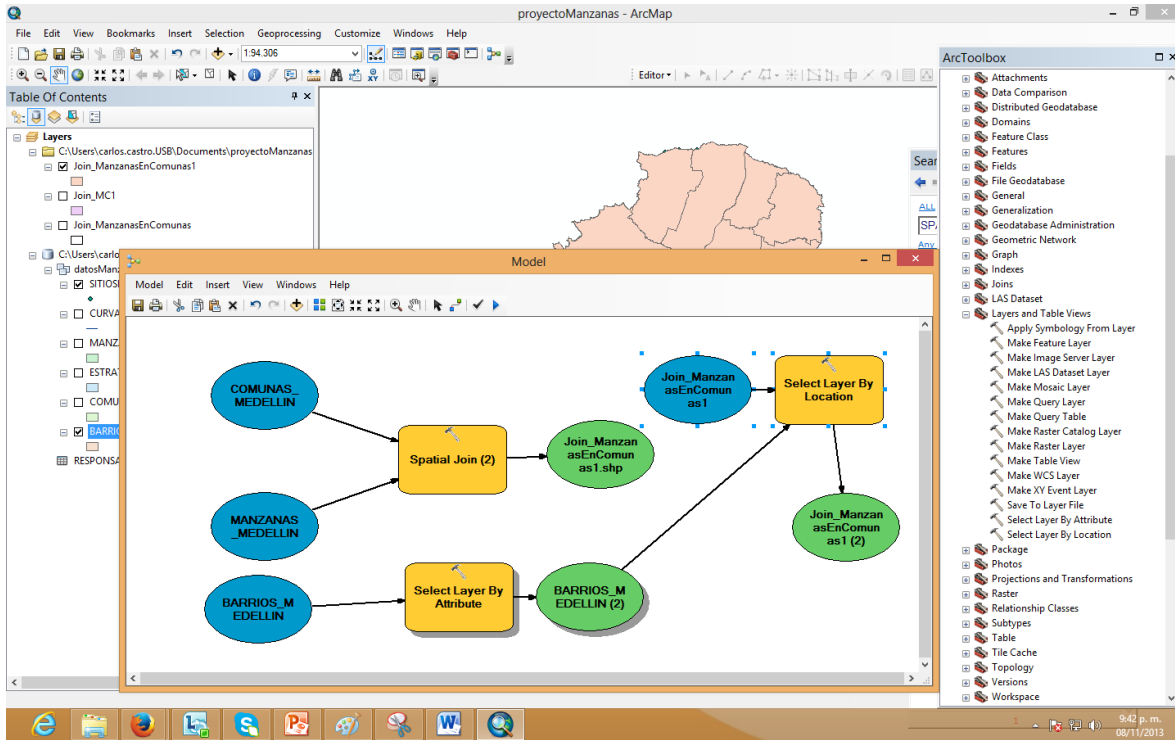
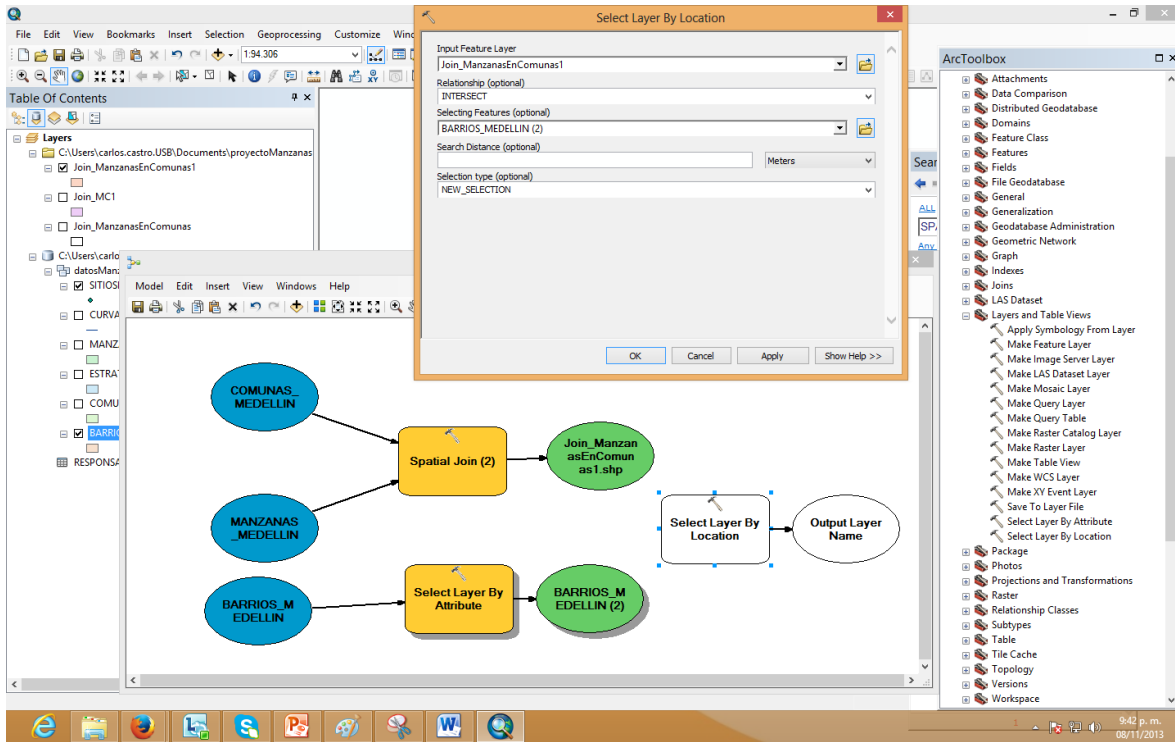
Frequency Distribution

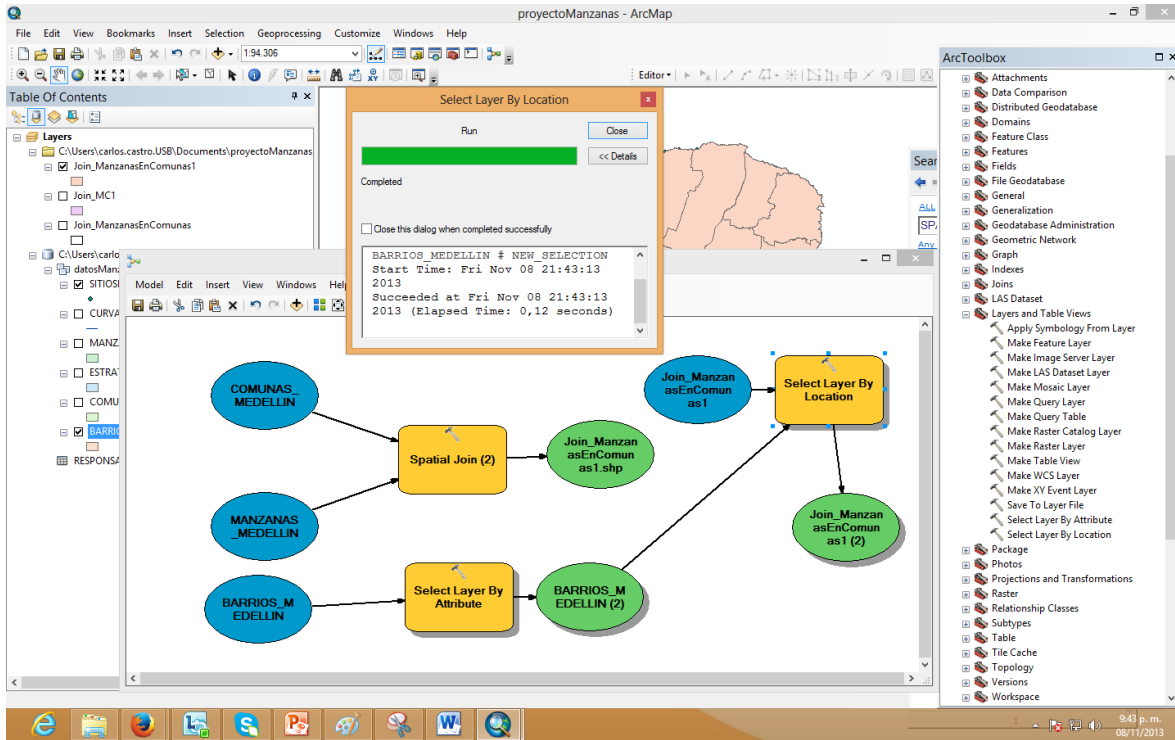
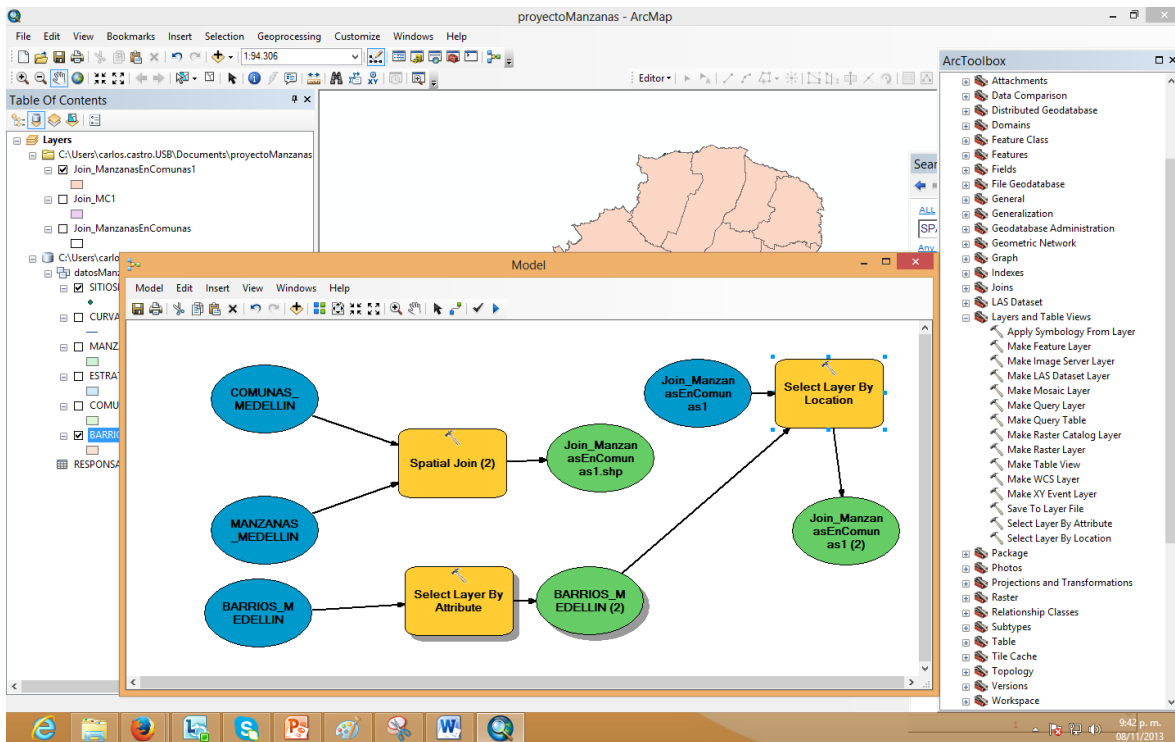
Join_Count	Frequency
0	1
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1

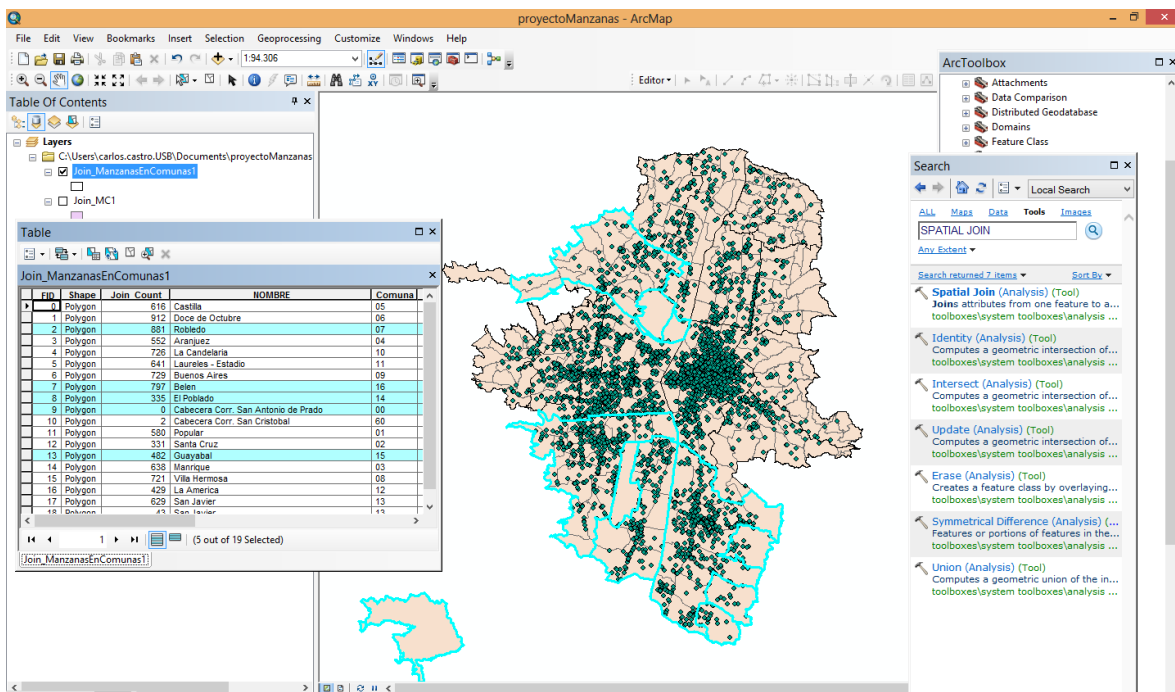
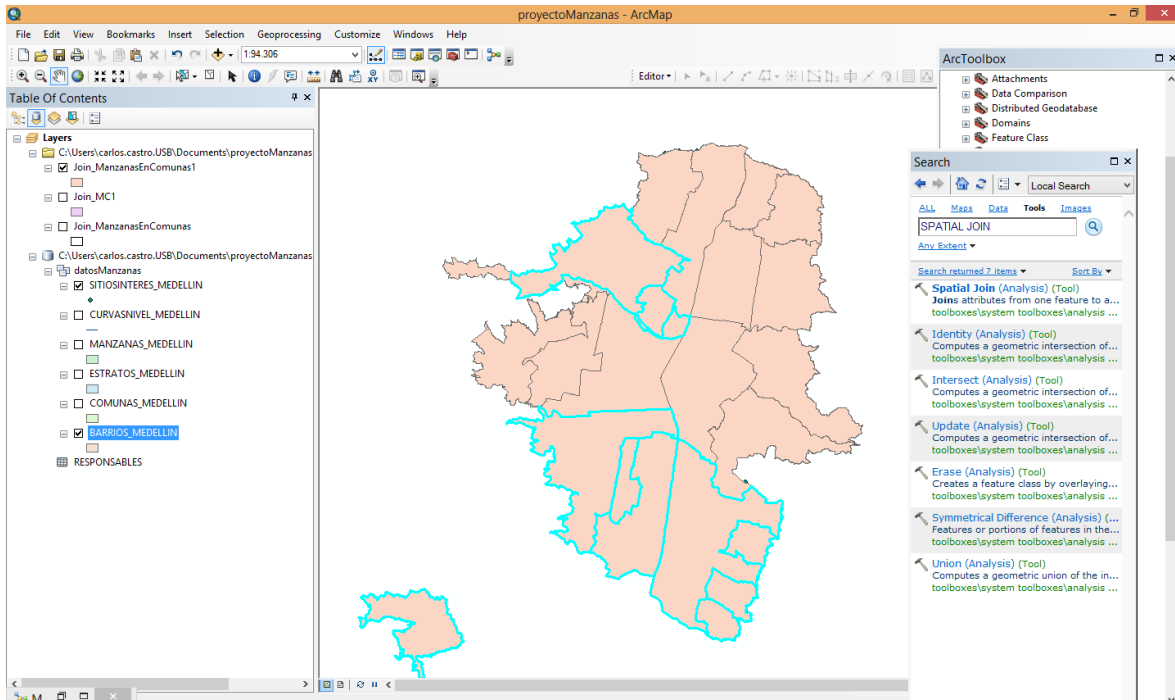


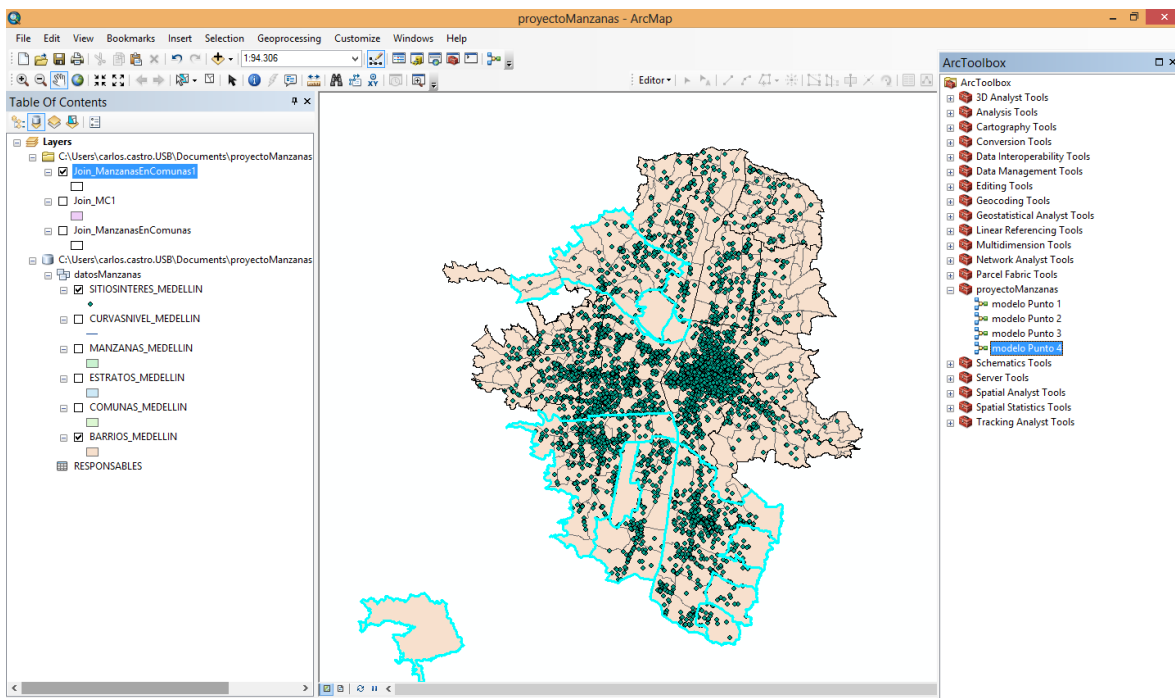
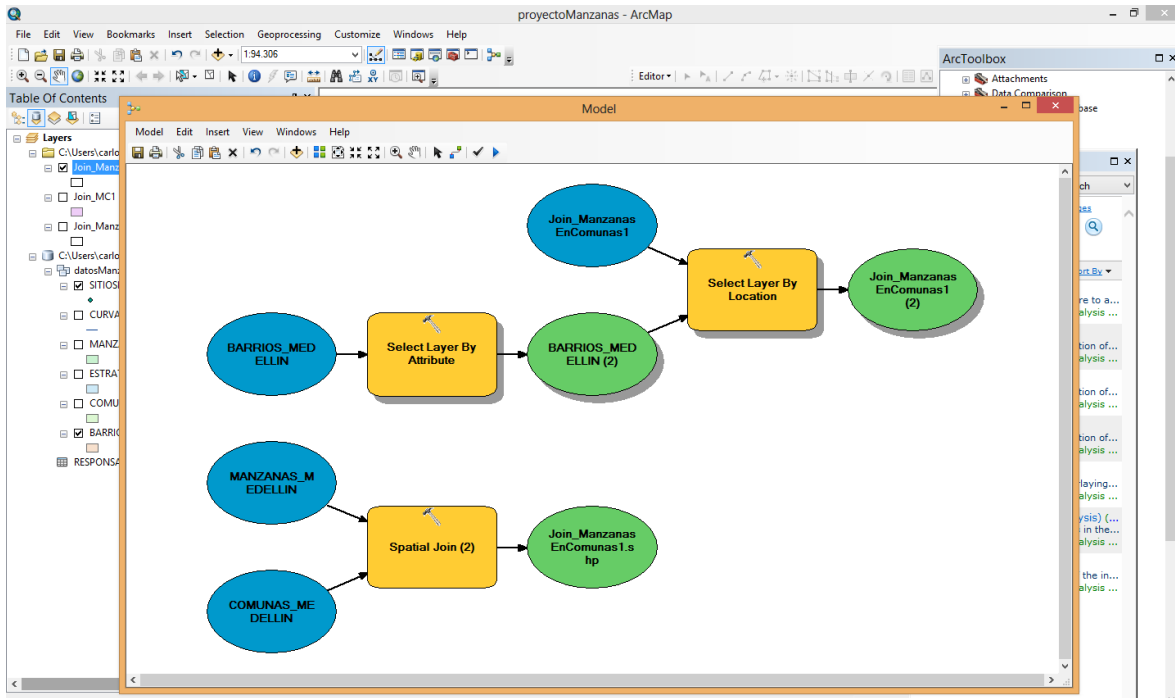


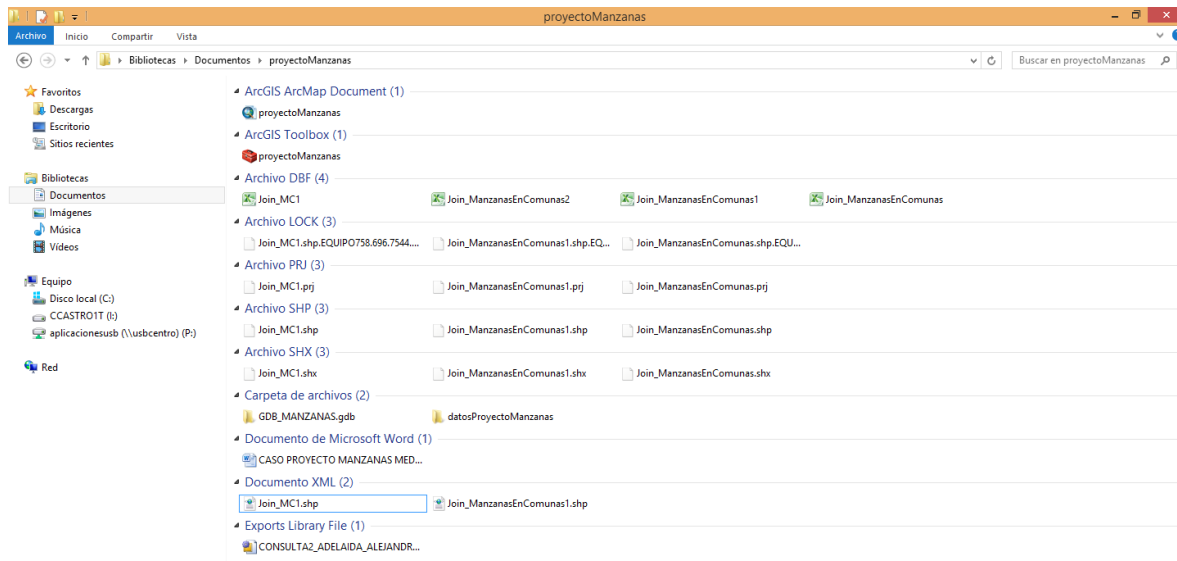












## Información de contacto

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Trabajo de grado - Proyecto de investigación denominado “Prácticas ágiles de Ingeniería en el desarrollo de contenidos de aprendizaje interactivos para Geoinformática con Aprendizaje Basado en Problemas”

Presentado por:

Breider Manuel Gomez Mosquera

Jonathan Mejía Tejada

Asesor: Ricardo Botero TdeA

Profesor: Carlos Castro USB

### Instituciones participantes

