TUTORIAL 6
GEOPROCESSING

Generally you will need to extract or otherwise process study areas for GIS applications from available base maps. In this chapter, you will learn how to extract a subset of spatial features from a map using attribute or spatial queries. You will also learn how to aggregate polygons to larger polygons and how to append two or more layers into a single layer. This sort of work using GIS processes is called "geoprocessing".

Main learning objectives are following :

- Clip features
- Dissolve features
- Merge features
- Intersect Layers
- Union Layers

TUTORIAL 6.1

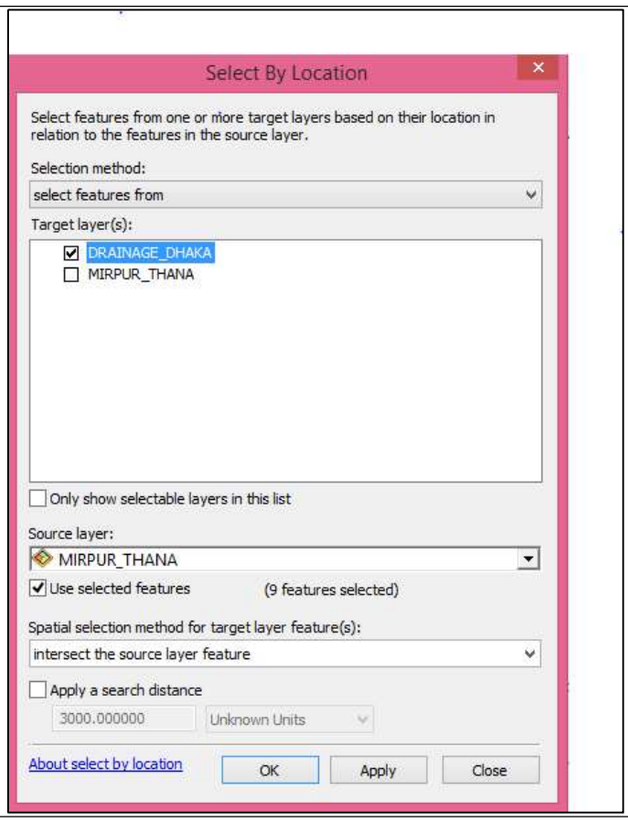
CLIP FEATURES

6.1.1	Use the Select By Location dialog box
6.1.2	Clip drainage network

6.1.1 Use the Select By Location dialog box

In the following steps, you will use the Select By Location dialog box to select the drainage line in Mirpur Thana only. After selecting the roads, you will create a new line feature class from them.

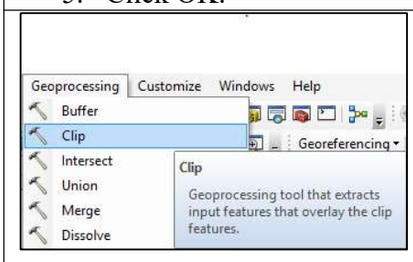
1. Navigate to the D:\CE210\Tutorial 6\CLIP and add the files-DRAINAGE_DHAKA.shp and MIRPUR_THANA.shp
2. On the main menu, click Selection, Select By Location
3. Make selections as shown in the image
4. Click Apply, Close

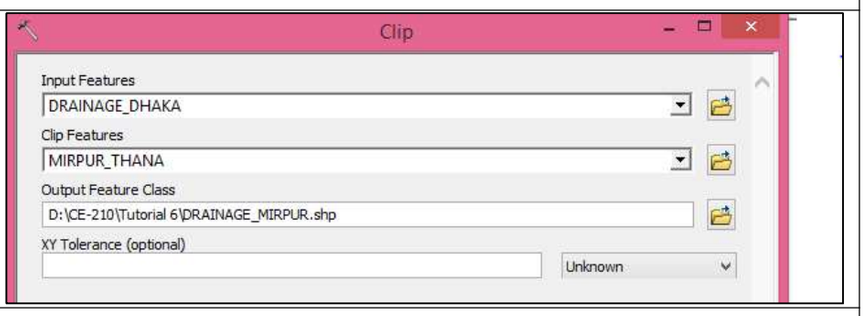


6.1.2 Clip drainage network

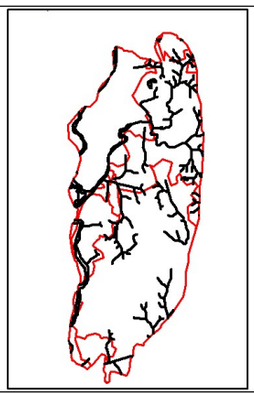
Next, you will use the Clip geoprocessing tool to cut off the Drainage line for Mirpur Thana using MIRPUR_THANA shape file. Once this is done, the drainage line in Mirpur Thana will have no dangling lines.

1. Click Geoprocessing, Clip
2. In the Clip dialog box, click the Input Features drop-down list and choose DRAINAGE_DHAKA.
3. Click the Clip Features drop-down list and choose MIRPUR_THANA.
4. Save the Output Features Class as DRAINAGE_MIRPUR in your desired file geodatabase.
5. Click OK.





6. Turn the DRAINAGE_DHAKA layer off and symbolize the DRAINAGE_MIRPUR layer as a thick black line. The output added to your map will be drainage network that intersect the Mirpur Thana polygon.

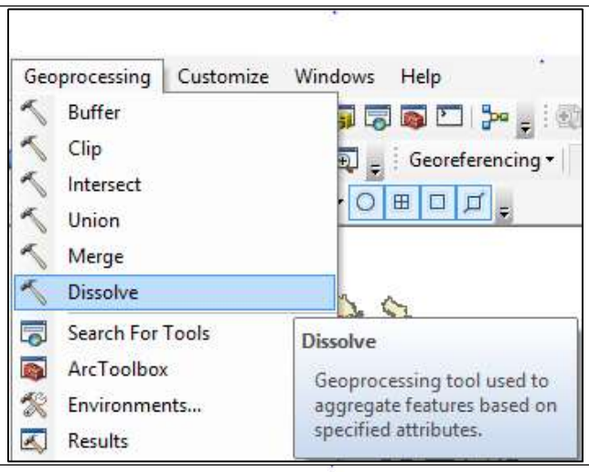


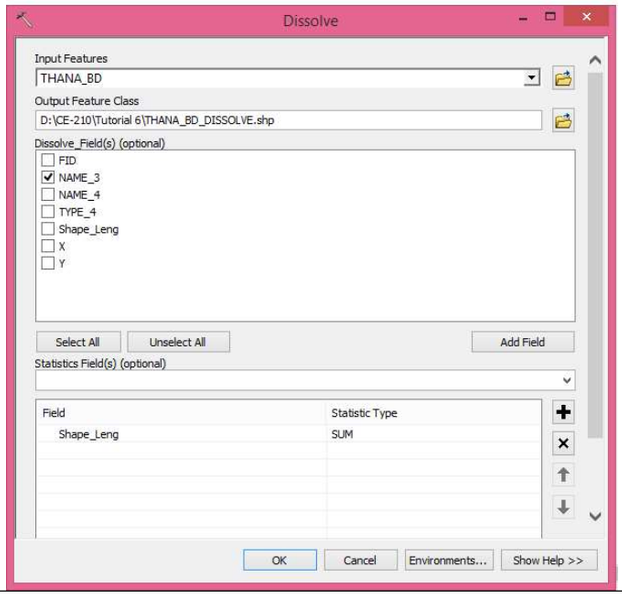
TUTORIAL 6.2

DISSOLVE FEATURES

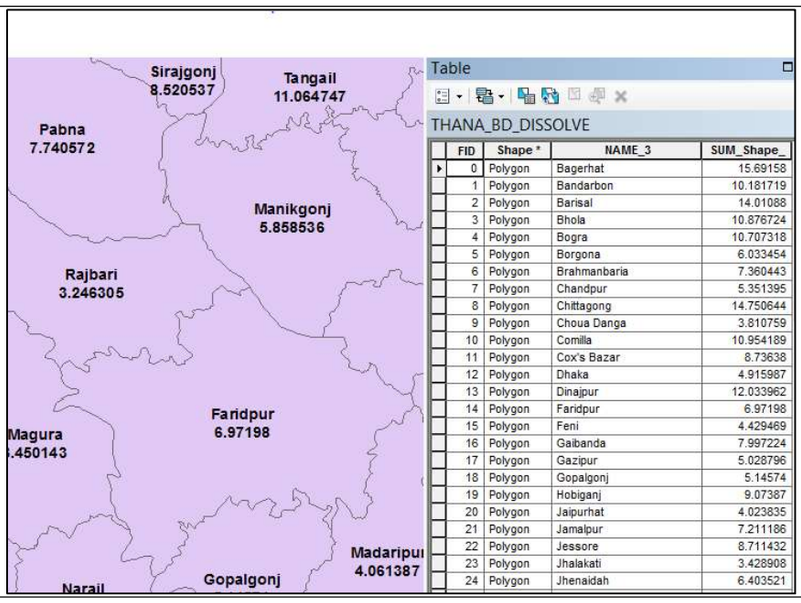
You can create administrative or other types of boundaries by merging polygons in a feature class that share common attribute values. This type of merge is called a dissolve.

1. Navigate to the D:\CE210\Tutorial 6\DISSOLVE and add the file THANA_BD.shp
2. From the main menu, select Geoprocessing, Dissolve. In the Dissolve dialog box, select the followings:
    a. From the Input Feature drop-down list, select THANA_BD layer.
    b. Save the Output Feature Class as THANA_BD_DISSOLVE in your desired file geodatabase.
    c. In the Dissolve Fields, select Name_3.
    d. In the statistics field, select Shape_Leng and in Statistic Type select SUM
    e. Click OK.





3. The Feature Class “THANA_BD_DISSOLVE” contains 63 polygons with the total shape length summed for each polygon.

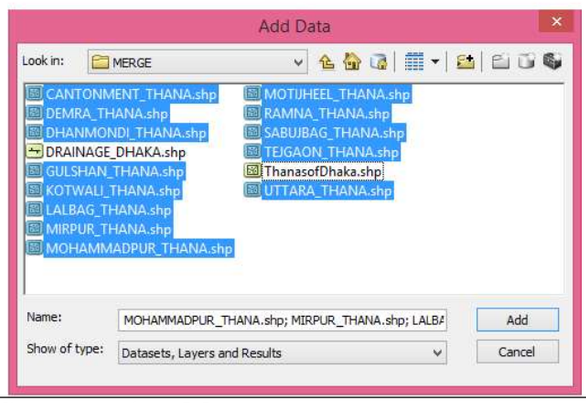


TUTORIAL 6.3

MERGE FEATURES

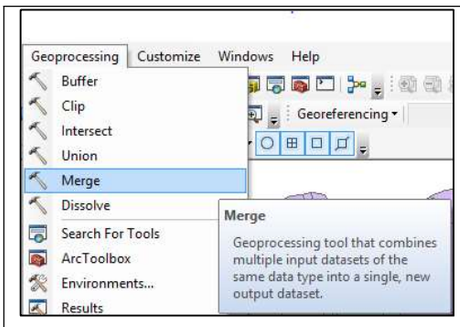
Sometimes it is necessary to merge two or more separate but adjacent layers into a single layer. For example, you may want to build a water layer for an environmental study that includes several adjacent counties. Using the Merge tool, you could merge county water layers into a single layer, then use the layer for further analysis.

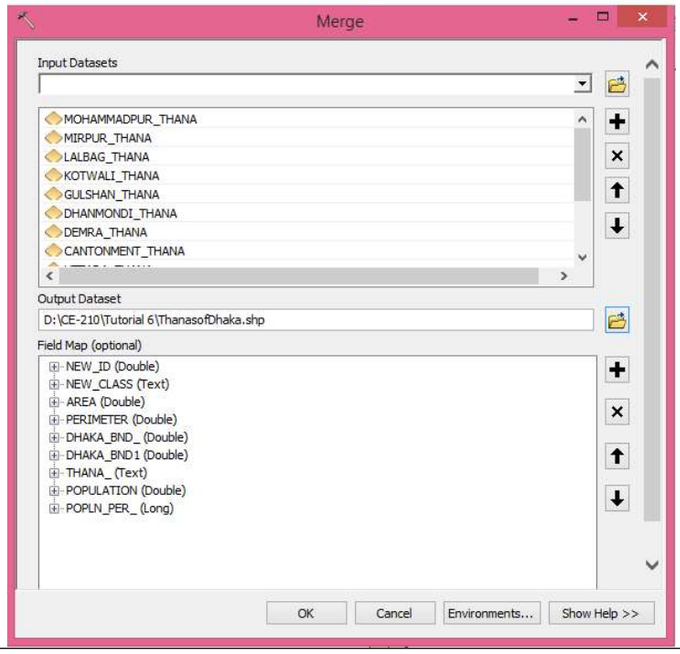
1. Navigate to the D:\CE210\Tutorial 6\MERGE and add the files shown below-

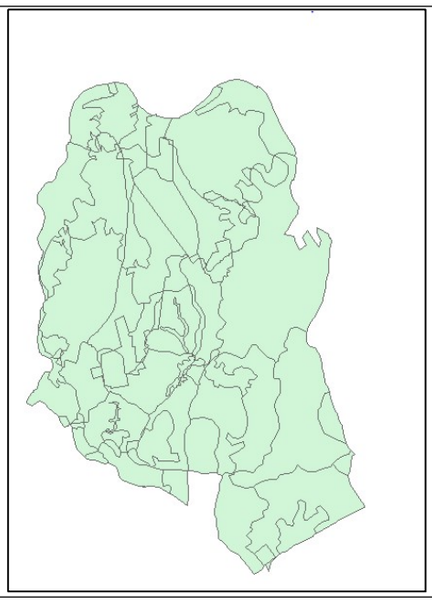


2. On the main menu, click Geoprocessing, Merge
3. In the Merge dialog box, click the Input Datasets drop-down list and choose all thana layers.
4. Save the output feature class as ‘ThanasofDhaka’ in your desired file geodatabase.
5. Click OK

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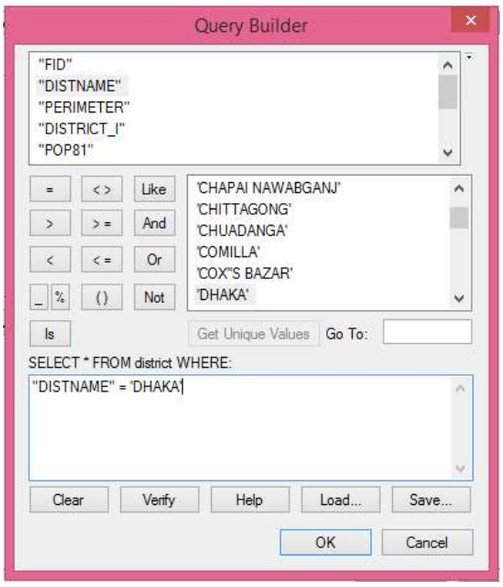


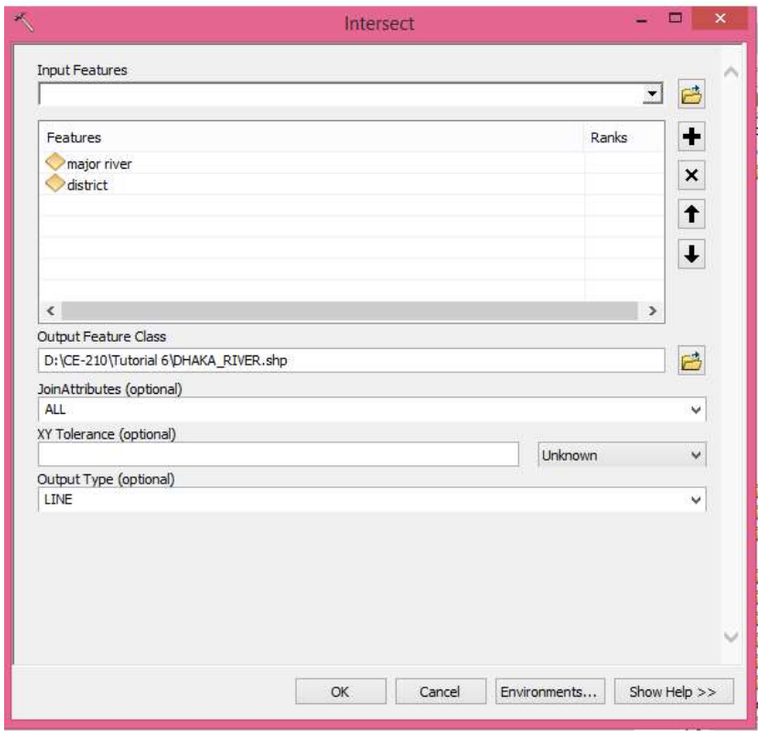
TUTORIAL 6.4

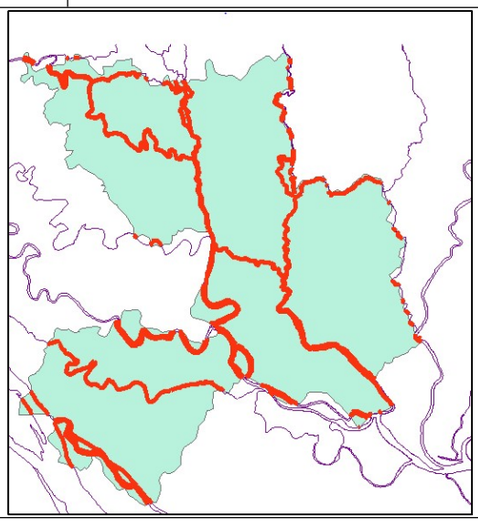
INTERSECT FEATURES

The intersect tool creates a new feature class from all the features of two input, overlying feature classes. For example, an emergency preparedness official might like to know the name of the water boundary that each road crosses over (or intersects). ArcGIS can provide such information using the Intersect tool. Intersect excludes any parts of the two or more input layers that do not overlay each other.

1. Navigate to the D:\CE210\Tutorial 6\INTERSECT and add the files-district.shp and majorriver.shp.
2. First select Dhaka district using query builder or select by attributes as “DISTNAME=DHAKA”.
3. On the main menu, click Geoprocessing, Intersect
4. From the Input Features drop-down list, choose district.shp and majorriver.shp one at a time
5. Save the Output Features Class as DHAKA_RIVER in your desired file geodatabase
6. Verify that the Intersect settings match the graphic at the right
7. Click OK
8. Turn the majorriver layer off and symbolize this layer as a thick black line. The output added to your map will be rivers that intersect the thanas of Dhaka





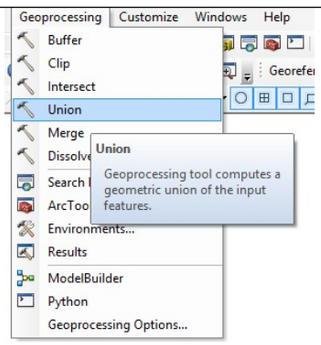


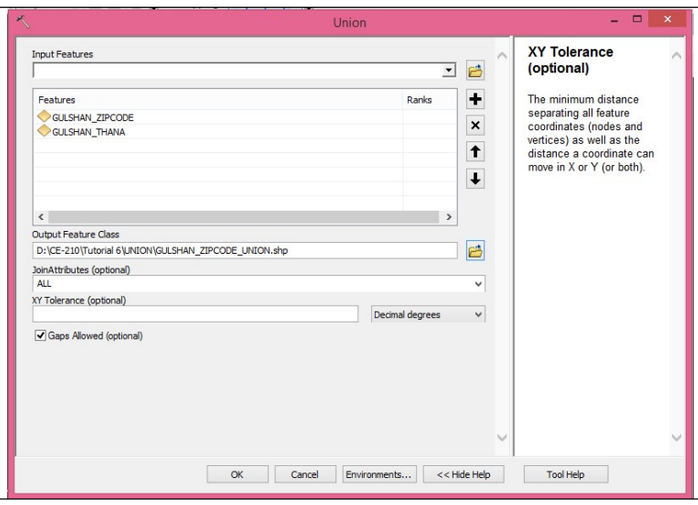
TUTORIAL 6.5

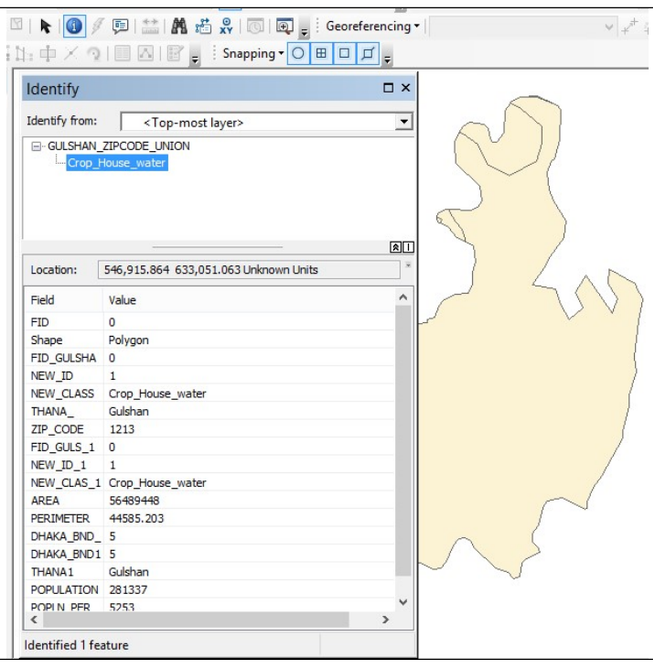
UNION FEATURES

The Union tool combines the geometry and attribute of two input polygon layers to generate a new output polygon layers. Union keeps all features of the input layers, even if they do not overlap.

1. Navigate to the D:\CE210\Tutorial 6\UNION and add the files-GULSHAN_THANA.shp and GULSHAN_ZIPCODE.shp
2. On the main menu, click Geoprocessing, Union.
3. From the **Input Features** drop-down list, choose GULSHAN_THANA and GULSHAN_ZIPCODE one at a time.
4. Save the **Output Features Class** as **GULSHAN_ZIPCODE_UNION** in your desired file geodatabase.
5. Click OK. The output added to your map contains Gulshan area with population data, landuse type and ZIP code data attached to each polygon.
6. Now click on identify icon and click on any polygon to observe the attribute informations.


Geoprocessing
Customize
Windows
Help
Buffer
Clip
Intersect
Union
Merge
Dissolve
Search
ArcToo
Environments...
Results
ModelBuilder
Python
Geoprocessing Options...
Union
Geoprocessing tool computes a geometric union of the input features.


Union
Input Features
Features
Ranks
GULSHAN_ZIPCODE
GULSHAN_THANA
Output Feature Class
D:\CE-210\Tutorial 6\UNION\GULSHAN_ZIPCODE_UNION.shp
JoinAttributes (optional)
ALL
XY Tolerance (optional)
Decimal degrees
Gaps Allowed (optional)
XY Tolerance (optional)
The minimum distance separating all feature coordinates (nodes and vertices) as well as the distance a coordinate can move in X or Y (or both).
OK
Cancel
Environments...
<< Hide Help
Tool Help


Georeferencing
Snapping
Identify
Identify from:
<Top-most layer>
GULSHAN_ZIPCODE_UNION
Crop_House_water
Location:
546,915.864 633,051.063 Unknown Units
Field
Value
FID 0
Shape Polygon
FID_GULSHA 0
NEW_ID 1
NEW_CLASS Crop_House_water
THANA_ Gulshan
ZIP_CODE 1213
FID_GULS_1 0
NEW_ID_1 1
NEW_CLAS_1 Crop_House_water
AREA 56489448
PERIMETER 44585.203
DHAKA_BND_ 5
DHAKA_BND1 5
THANA1 Gulshan
POPULATION 281337
Identified 1 feature