ARC-GIS

EXCERCISE: 1

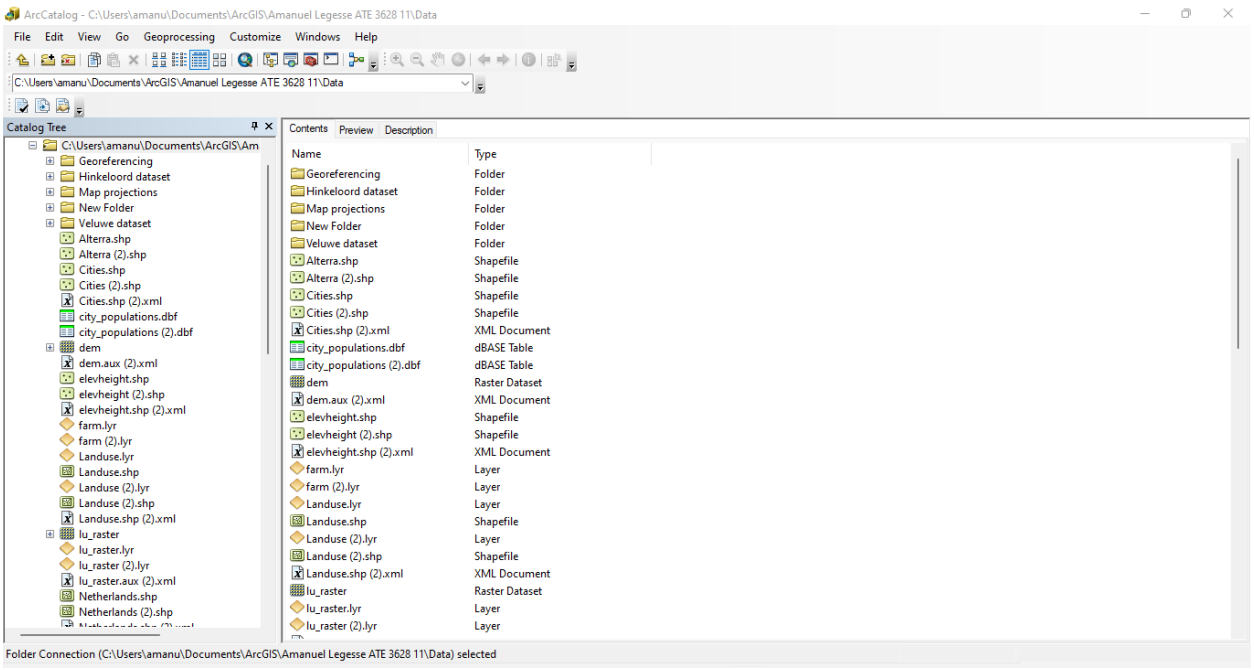
AMANUEL LEGESSE

SOFTWARE ENG. EXT

ID – ATE/3628/11

GETTING TO KNOW ARCGIS

1.A : Start the program ArcCatalog and access spatial data



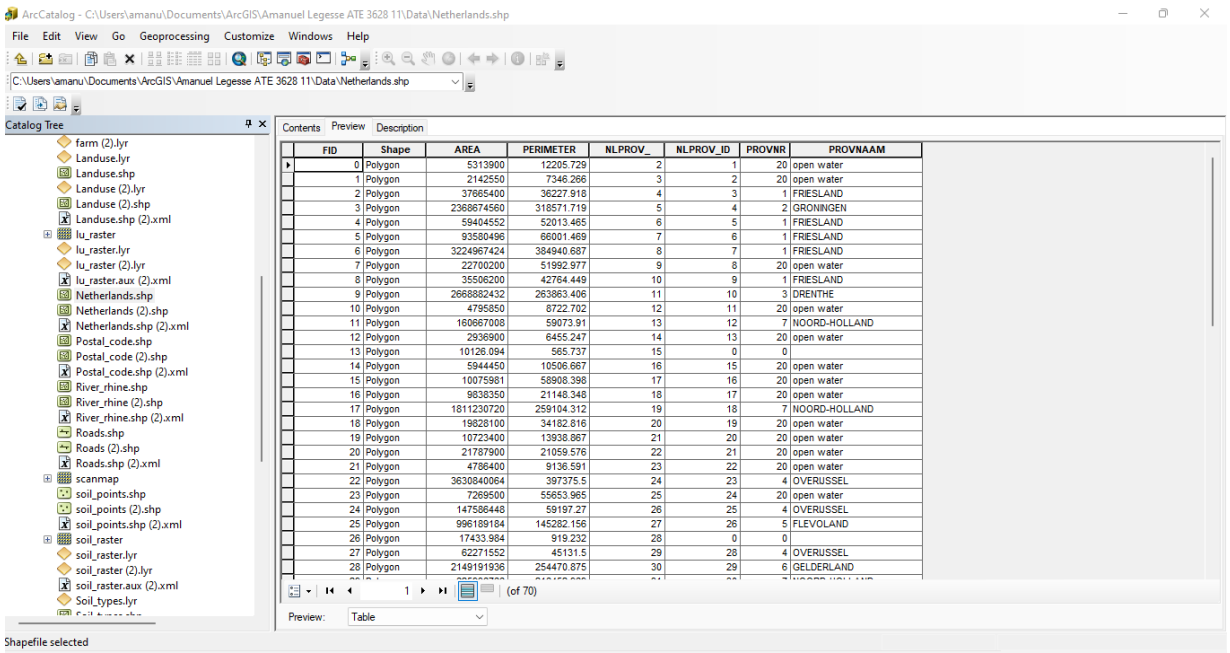
- The different file types of this folder are .shp, .xml, .dbf and .lyr

1.B :

- layer, database table and xml document

Examining spatial data

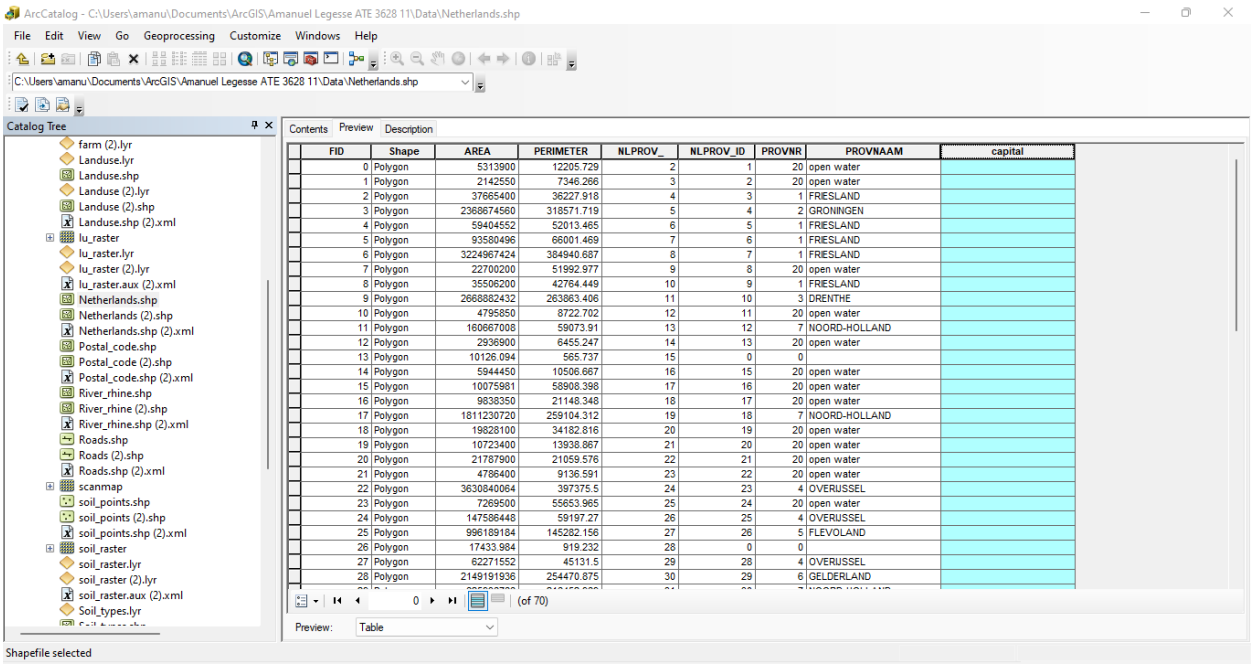
2.A:



FID	Shape	AREA	PERIMETER	NLPROV_	NLPROV_ID	PROVNR	PROVNAAM
0	Polygon	5313900	12205.729	2	1	20	open water
1	Polygon	2142550	7346.266	3	2	20	open water
2	Polygon	37665400	36227.918	4	3	1	FRIESLAND
3	Polygon	2368674560	318571.719	5	4	2	GRONINGEN
4	Polygon	59404552	52013.465	6	5	1	FRIESLAND
5	Polygon	93580496	66001.469	7	6	1	FRIESLAND
6	Polygon	3224967424	384940.687	8	7	1	FRIESLAND
7	Polygon	22700200	51992.977	9	8	20	open water
8	Polygon	35506200	42764.449	10	9	1	FRIESLAND
9	Polygon	2668882432	263863.406	11	10	3	DRENTHE
10	Polygon	4795850	8722.702	12	11	20	open water
11	Polygon	160667008	59073.91	13	12	7	NOORD-HOLLAND
12	Polygon	2936900	6455.247	14	13	20	open water
13	Polygon	10126.094	565.737	15	0	0	
14	Polygon	5944450	10506.667	16	15	20	open water
15	Polygon	10075981	58908.398	17	16	20	open water
16	Polygon	9838350	21148.348	18	17	20	open water
17	Polygon	1811230720	259104.312	19	18	7	NOORD-HOLLAND
18	Polygon	19828100	34182.816	20	19	20	open water
19	Polygon	10723400	13938.867	21	20	20	open water
20	Polygon	21787900	21059.576	22	21	20	open water
21	Polygon	4786400	9136.591	23	22	20	open water
22	Polygon	3630840064	397375.5	24	23	4	OVERIJSSEL
23	Polygon	7269500	55653.965	25	24	20	open water
24	Polygon	147586448	59197.27	26	25	4	OVERIJSSEL
25	Polygon	996189184	145282.156	27	26	5	FLEVOLAND
26	Polygon	17433.984	919.232	28	0	0	
27	Polygon	62271552	45131.5	29	28	4	OVERIJSSEL
28	Polygon	2149191936	254470.875	30	29	6	GELDERLAND

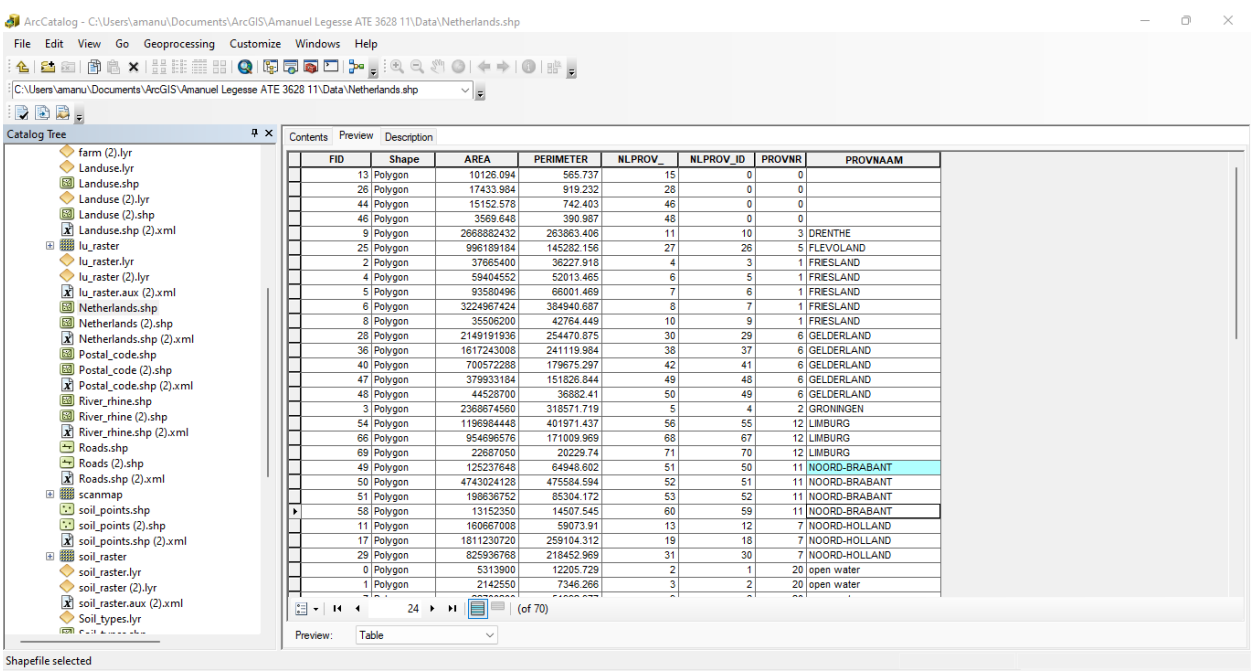
- The table contains 70 records and 8 fields.

2.B:



FID	Shape	AREA	PERIMETER	NLPROV_	NLPROV_ID	PROVNR	PROVNAAM	capital
0	Polygon	5313900	12205.729	2	1	20	open water	
1	Polygon	2142550	7346.266	3	2	20	open water	
2	Polygon	37665400	36227.918	4	3	1	FRIESLAND	
3	Polygon	2368674560	318571.719	5	4	2	GRONINGEN	
4	Polygon	59404552	52013.465	6	5	1	FRIESLAND	
5	Polygon	93580496	66001.469	7	6	1	FRIESLAND	
6	Polygon	3224967424	384940.687	8	7	1	FRIESLAND	
7	Polygon	22700200	51992.977	9	8	20	open water	
8	Polygon	35506200	42764.449	10	9	1	FRIESLAND	
9	Polygon	2668882432	263863.406	11	10	3	DRENTHE	
10	Polygon	4795850	8722.702	12	11	20	open water	
11	Polygon	160667008	59073.91	13	12	7	NOORD-HOLLAND	
12	Polygon	2936900	6455.247	14	13	20	open water	
13	Polygon	10126.094	565.737	15	0	0		
14	Polygon	5944450	10506.667	16	15	20	open water	
15	Polygon	10075981	58908.398	17	16	20	open water	
16	Polygon	9838350	21148.348	18	17	20	open water	
17	Polygon	1811230720	259104.312	19	18	7	NOORD-HOLLAND	
18	Polygon	19828100	34182.816	20	19	20	open water	
19	Polygon	10723400	13938.867	21	20	20	open water	
20	Polygon	21787900	21059.576	22	21	20	open water	
21	Polygon	4786400	9136.591	23	22	20	open water	
22	Polygon	3630840064	397375.5	24	23	4	OVERIJSSEL	
23	Polygon	7269500	55653.965	25	24	20	open water	
24	Polygon	147586448	59197.27	26	25	4	OVERIJSSEL	
25	Polygon	996189184	145282.156	27	26	5	FLEVOLAND	
26	Polygon	17433.984	919.232	28	0	0		
27	Polygon	62271552	45131.5	29	28	4	OVERIJSSEL	
28	Polygon	2149191936	254470.875	30	29	6	GELDERLAND	

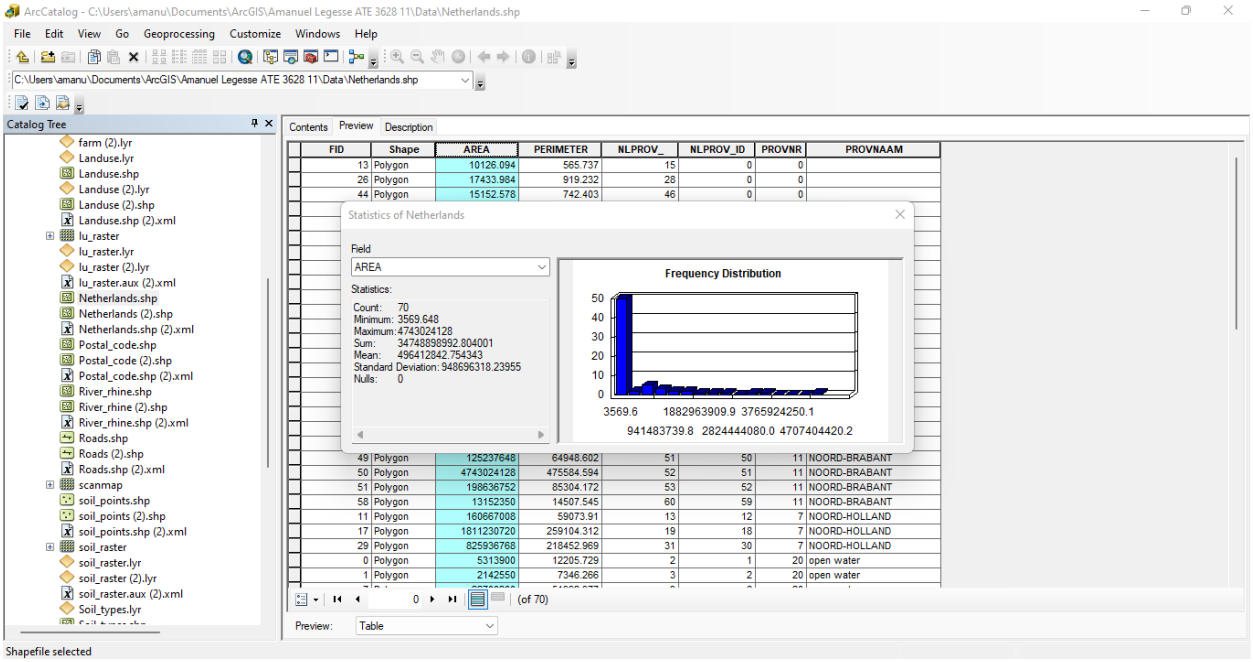
2.D:



FID	Shape	AREA	PERIMETER	NLPROV_	NLPROV_ID	PROVNR	PROVNAAM
13	Polygon	10126.094	565.737	15	0	0	
26	Polygon	17433.984	919.232	28	0	0	
44	Polygon	15152.578	742.403	46	0	0	
46	Polygon	3569.648	390.987	48	0	0	
9	Polygon	2668882432	263863.406	11	10	3	DRENTHE
25	Polygon	996189184	145282.156	27	26	5	FLEVOLAND
2	Polygon	37665400	36227.918	4	3	1	FRIESLAND
4	Polygon	59404552	52013.465	6	5	1	FRIESLAND
5	Polygon	93580496	66001.469	7	6	1	FRIESLAND
6	Polygon	3224967424	384940.687	8	7	1	FRIESLAND
8	Polygon	35506200	42764.449	10	9	1	FRIESLAND
28	Polygon	2149191936	254470.875	30	29	6	GELDERLAND
36	Polygon	1617243008	241119.984	38	37	6	GELDERLAND
40	Polygon	700572288	179675.297	42	41	6	GELDERLAND
47	Polygon	379933184	151826.844	49	48	6	GELDERLAND
48	Polygon	44528700	36882.41	50	49	6	GELDERLAND
3	Polygon	2368674560	318571.719	5	4	2	GRONINGEN
54	Polygon	1196984448	401971.437	56	55	12	LIMBURG
66	Polygon	954696576	171009.969	68	67	12	LIMBURG
69	Polygon	22687050	20229.74	71	70	12	LIMBURG
49	Polygon	125237648	64948.602	51	50	11	NOORD-BRABANT
50	Polygon	4743024128	475584.594	52	51	11	NOORD-BRABANT
51	Polygon	198636752	85304.172	53	52	11	NOORD-BRABANT
58	Polygon	13152350	14507.545	60	59	11	NOORD-BRABANT
11	Polygon	160667008	59073.91	13	12	7	NOORD-HOLLAND
17	Polygon	1811230720	259104.312	19	18	7	NOORD-HOLLAND
29	Polygon	825936768	218452.969	31	30	7	NOORD-HOLLAND
0	Polygon	5313900	12205.729	2	1	20	open water
1	Polygon	2142550	7346.266	3	2	20	open water

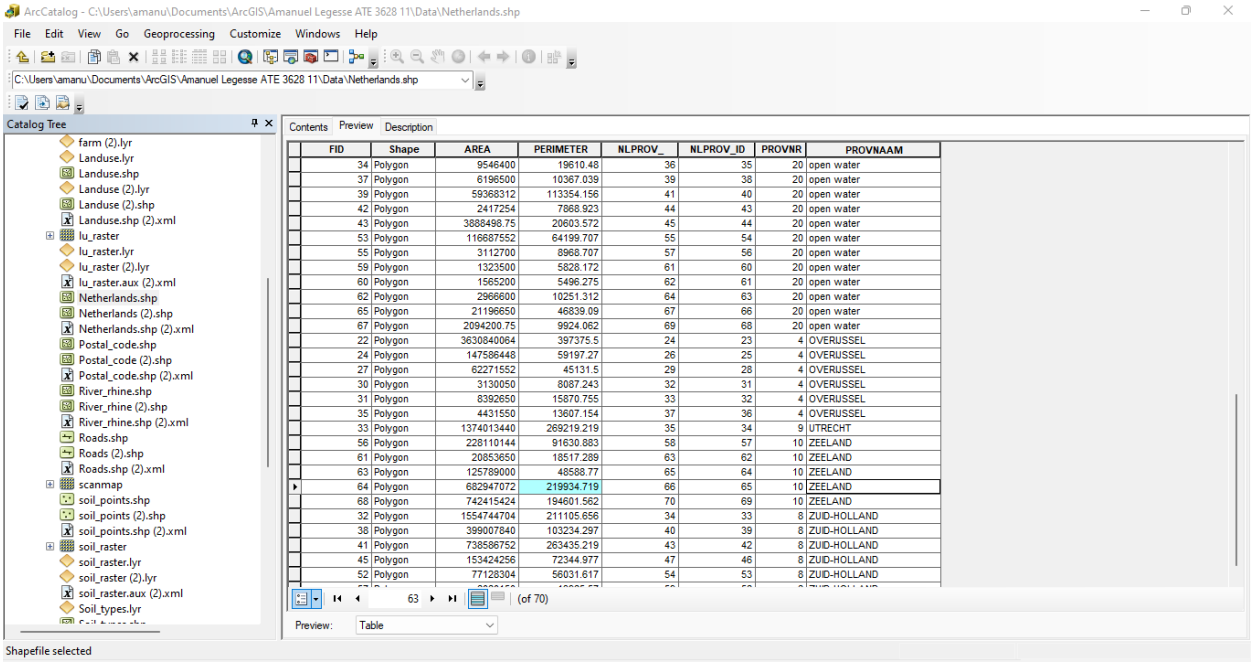
- 4 records belong to the province of Noord Brabant

2.E :



- The total area of Netherlands is 34748898992.804001

2.F:



FID	Shape	AREA	PERIMETER	NLPROV_	NLPROV_ID	PROVNR	PROVNAAM
34	Polygon	9546400	19610.48	36	35	20	open water
37	Polygon	6196500	10367.039	39	38	20	open water
39	Polygon	59368312	113354.156	41	40	20	open water
42	Polygon	2417254	7868.923	44	43	20	open water
43	Polygon	3888498.75	20603.572	45	44	20	open water
53	Polygon	116687552	64199.707	55	54	20	open water
55	Polygon	3112700	8968.707	57	56	20	open water
59	Polygon	1323500	5828.172	61	60	20	open water
60	Polygon	1565200	5496.275	62	61	20	open water
62	Polygon	2966600	10251.312	64	63	20	open water
65	Polygon	21196650	46839.09	67	66	20	open water
67	Polygon	2094200.75	9924.062	69	68	20	open water
22	Polygon	3630840064	397375.5	24	23	4	OVERIJSSEL
24	Polygon	147586448	59197.27	26	25	4	OVERIJSSEL
27	Polygon	62271552	45131.5	29	28	4	OVERIJSSEL
30	Polygon	3130050	8087.243	32	31	4	OVERIJSSEL
31	Polygon	8392650	15870.755	33	32	4	OVERIJSSEL
35	Polygon	4431550	13607.154	37	36	4	OVERIJSSEL
33	Polygon	1374013440	269219.219	35	34	9	UTRECHT
56	Polygon	228110144	91630.883	58	57	10	ZEELAND
61	Polygon	20853650	18517.289	63	62	10	ZEELAND
63	Polygon	125789000	48588.77	65	64	10	ZEELAND
64	Polygon	682947072	219934.719	66	65	10	ZEELAND
68	Polygon	742415424	194601.562	70	69	10	ZEELAND
32	Polygon	1554744704	211105.656	34	33	8	ZUID-HOLLAND
38	Polygon	399007840	103234.297	40	39	8	ZUID-HOLLAND
41	Polygon	738586752	263435.219	43	42	8	ZUID-HOLLAND
45	Polygon	153424256	72344.977	47	46	8	ZUID-HOLLAND
52	Polygon	77128304	56031.617	54	53	8	ZUID-HOLLAND

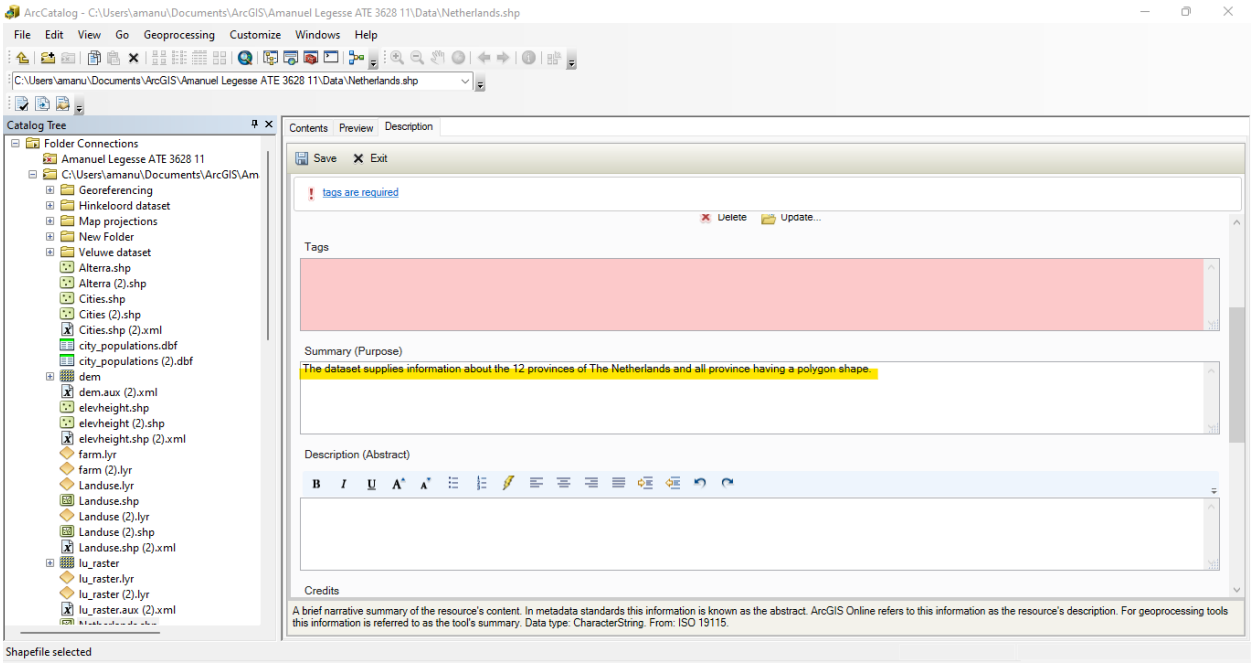
- ZEELAND province contains a feature that has a perimeter of 219934.719 meters.
- The value of the attribute ‘FID’ is 64.

2.G :

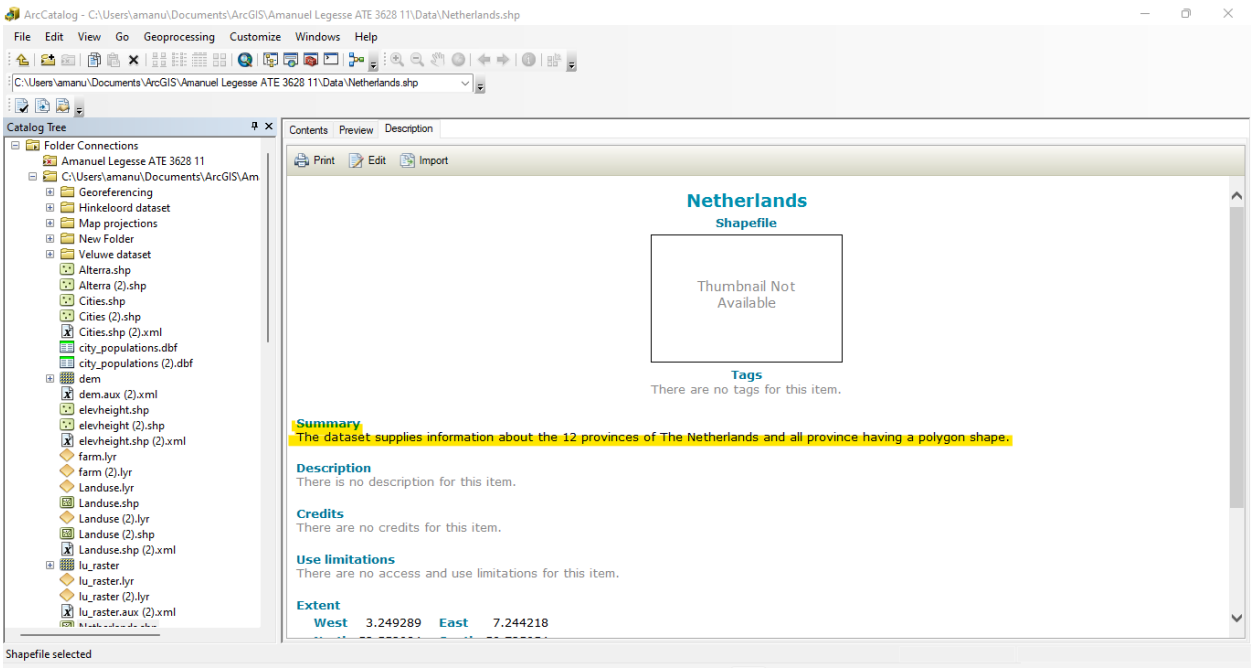
- ‘FID’ represents a value that uniquely identifies a record or feature.

Exploring the metadata of a spatial dataset

3.A:



3.B: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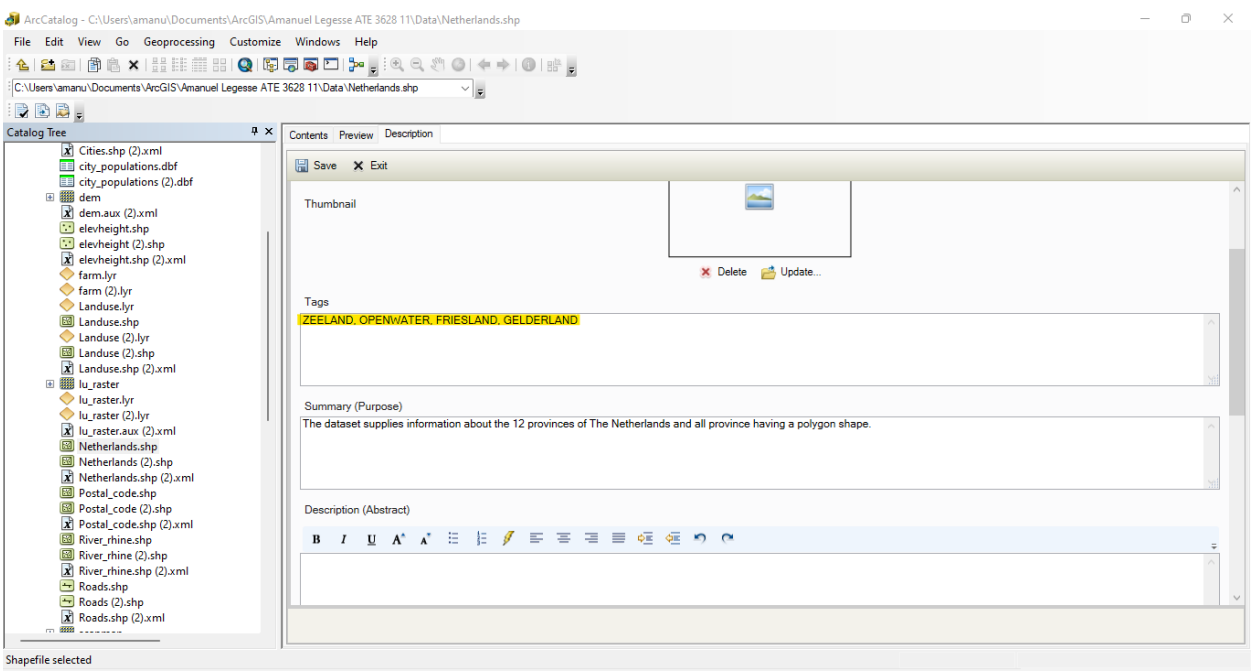
Contents Preview Description
Print Edit Import
Netherlands
Shapefile
Thumbnail Not Available
Tags
There are no tags for this item.
Summary
The dataset supplies information about the 12 provinces of The Netherlands and all province having a polygon shape.
Description
There is no description for this item.
Credits
There are no credits for this item.
Use limitations
There are no access and use limitations for this item.
Extent
West 3.249289 East 7.244218
Shapefile selected

3.C: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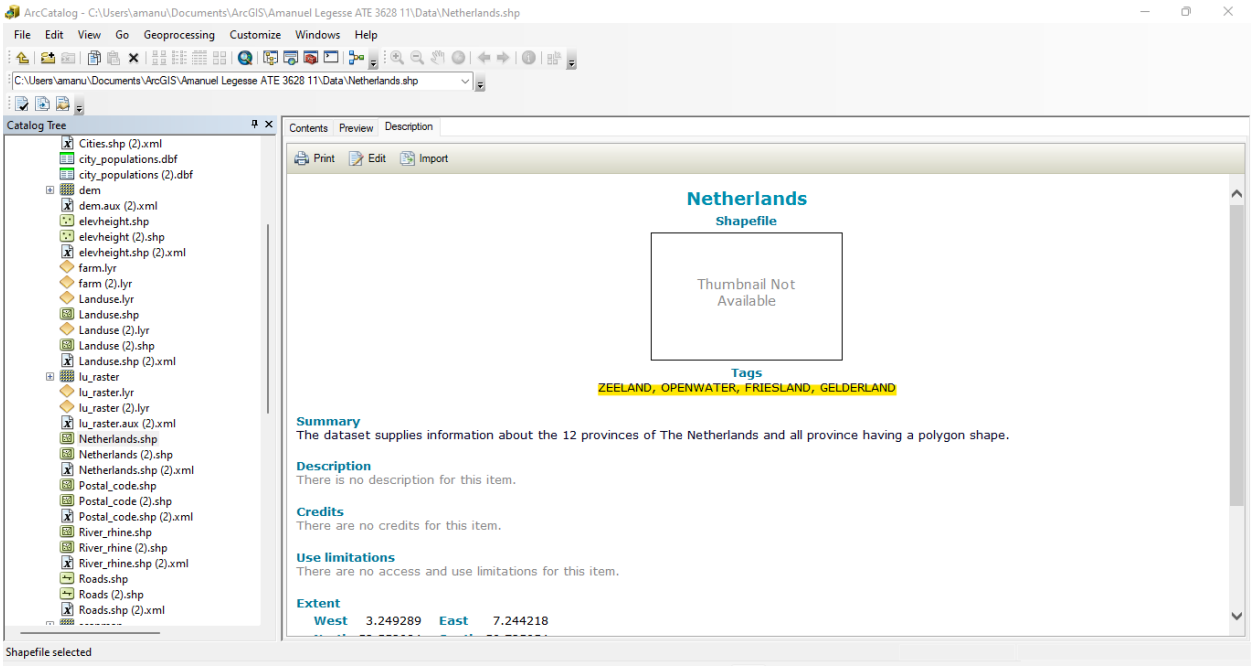
River_rhine (2).shp
River_rhine.shp (2).xml
Roads.shp
Roads (2).shp
Roads.shp (2).xml
Contents Preview Description
Save Exit
Thumbnail
Delete Update...
Tags
ZEELAND, OPENWATER, FRIESLAND, GELDERLAND
Summary (Purpose)
The dataset supplies information about the 12 provinces of The Netherlands and all province having a polygon shape.
Description (Abstract)
Shapefile selected

3.D:


ArcCatalog - C:\Users\amanu\Documents\ArcGIS\Amanuel Legesse ATE 3628 11\Data\Netherlands.shp
File Edit View Go Geoprocessing Customize Windows Help
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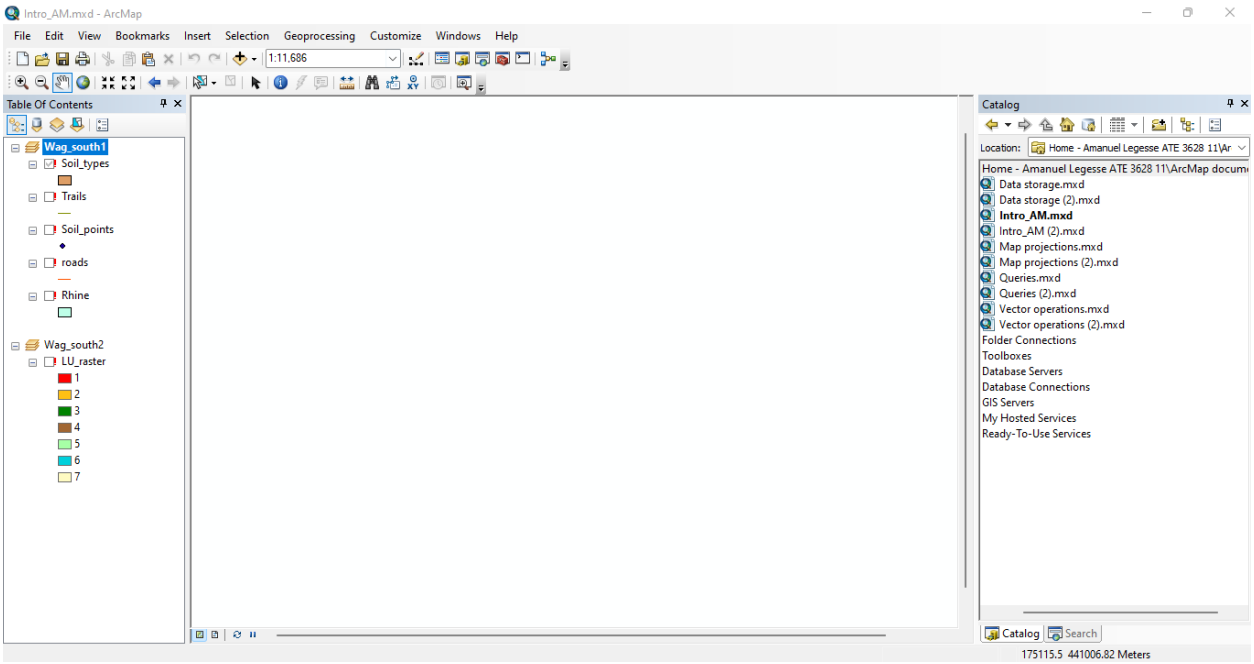
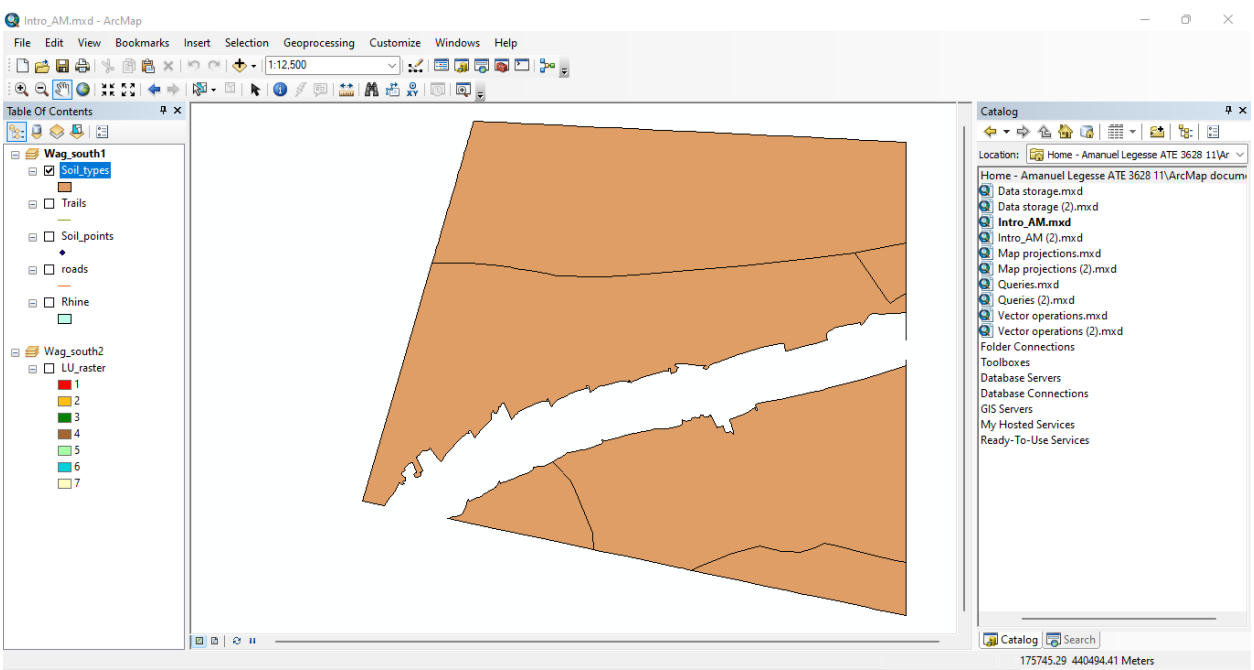
Contents Preview Description
Print Edit Import
Netherlands
Shapefile
Thumbnail Not Available
Tags
ZEELAND, OPENWATER, FRIESLAND, GELDERLAND
Summary
The dataset supplies information about the 12 provinces of The Netherlands and all province having a polygon shape.
Description
There is no description for this item.
Credits
There are no credits for this item.
Use limitations
There are no access and use limitations for this item.
Extent
West 3.249289 East 7.244218
Shapefile selected

Working with ArcMap

4.A :



5.A:



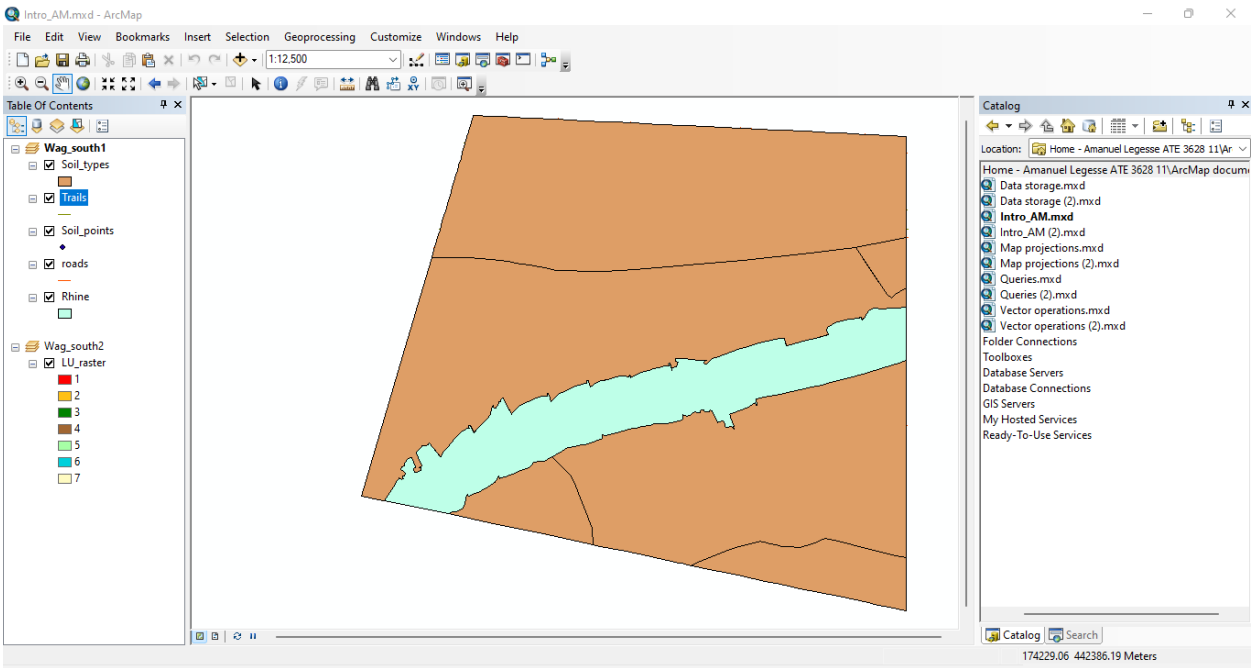
6.A : Activate a Data Frame and turn the visibility of a dataset on and off

- Intro_AM.mxd document contains 2 (Wag_south1 and Wag_south2) DataFrames.

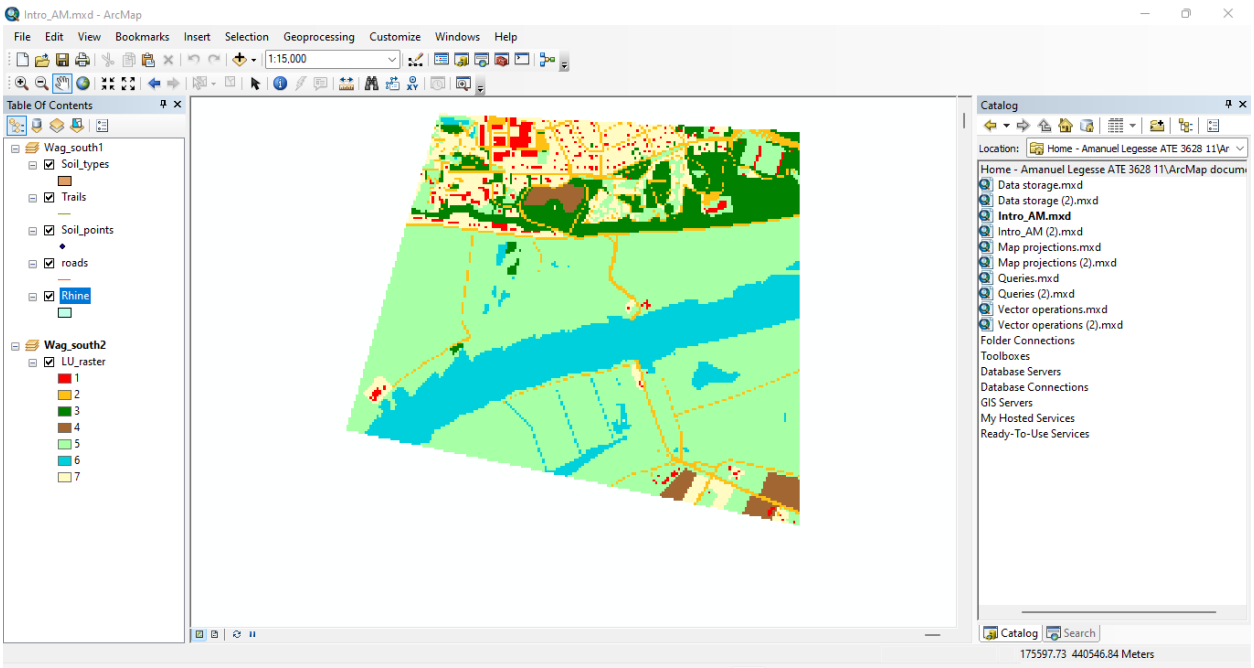
6.B :

- Wag_south1 contains 5 datasets.

6.C:



6.D :


Intro_AM.mxd - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:15,000
Table Of Contents
Wag_south1
Soil_types
Trails
Soil_points
roads
Rhine
Wag_south2
LU_raster
1
2
3
4
5
6
7
Catalog
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Intro_AM.mxd
Intro_AM (2).mxd
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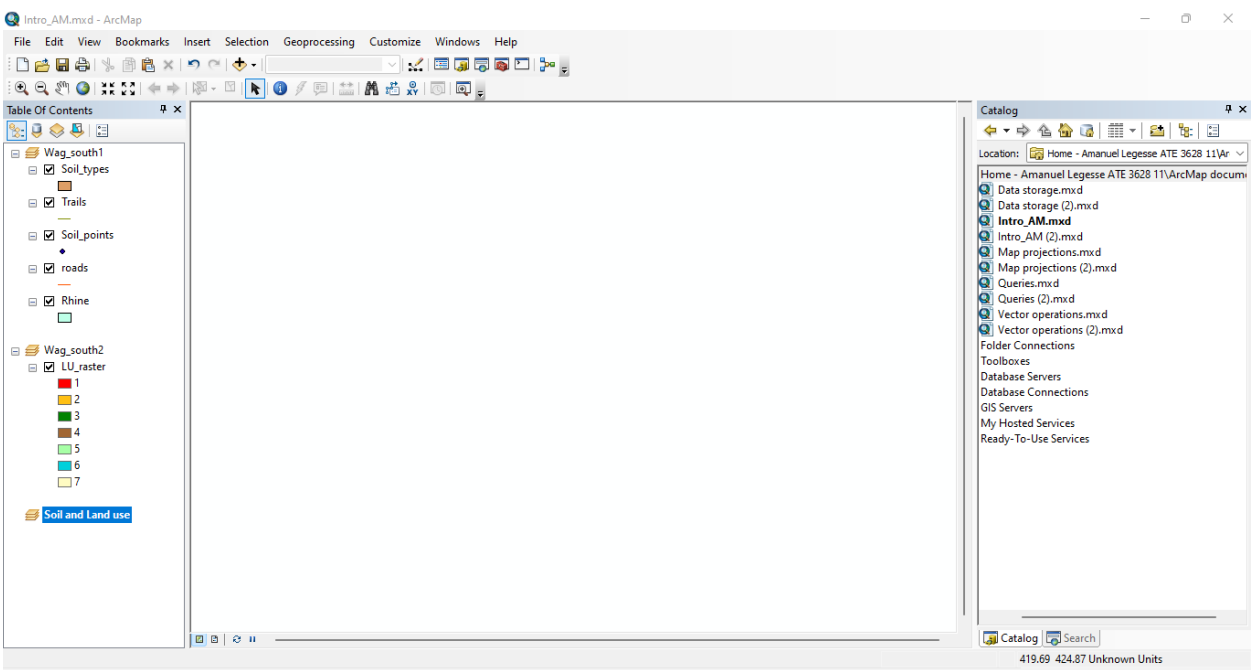
Map projections (2).mxd
Queries.mxd
Queries (2).mxd
Vector operations.mxd
Vector operations (2).mxd
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
My Hosted Services
Ready-To-Use Services
Catalog
Search
175597.73 440546.84 Meters

6.E :


Intro_AM.mxd - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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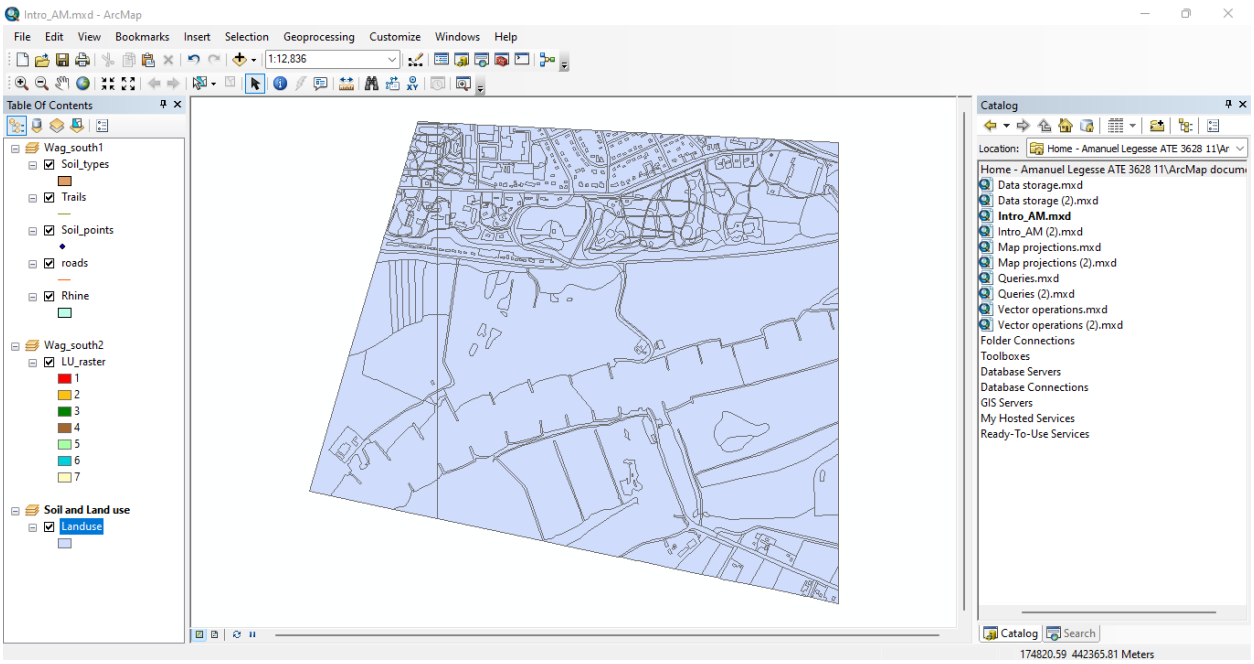
Wag_south1
Soil_types
Trails
Soil_points
roads
Rhine
Wag_south2
LU_raster
1
2
3
4
5
6
7
Soil and Land use
Catalog
Location: Home - Amanuel Legesse ATE 3628 11\Ar
Home - Amanuel Legesse ATE 3628 11\ArcMap docum
Data storage.mxd
Data storage (2).mxd
Intro_AM.mxd
Intro_AM (2).mxd
Map projections.mxd
Map projections (2).mxd
Queries.mxd
Queries (2).mxd
Vector operations.mxd
Vector operations (2).mxd
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
My Hosted Services
Ready-To-Use Services
Catalog
Search
419.69 424.87 Unknown Units

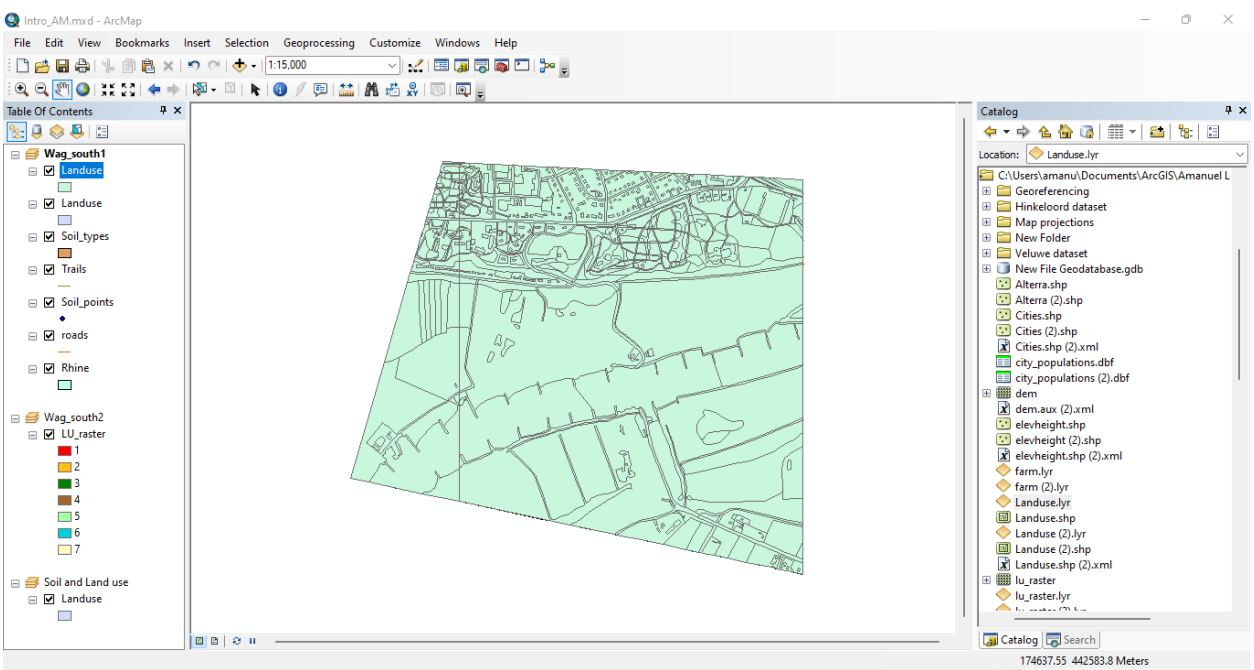
➢ Adding datasets

7.A :

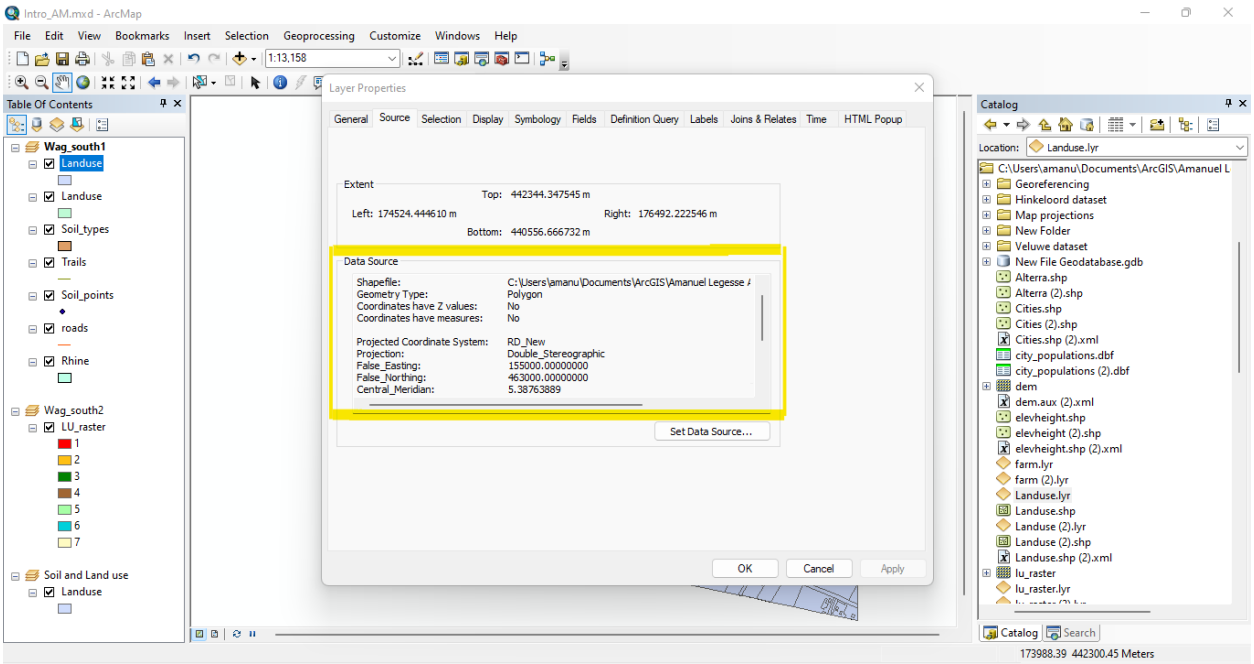


Working with layer files

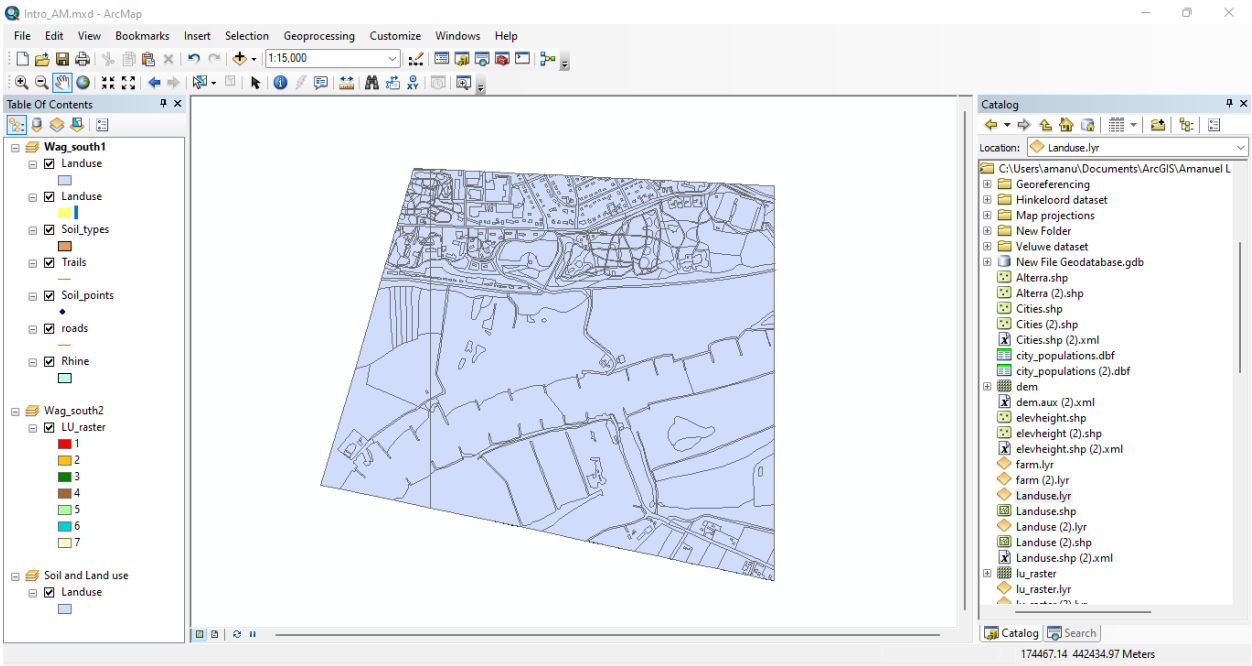
8.A :



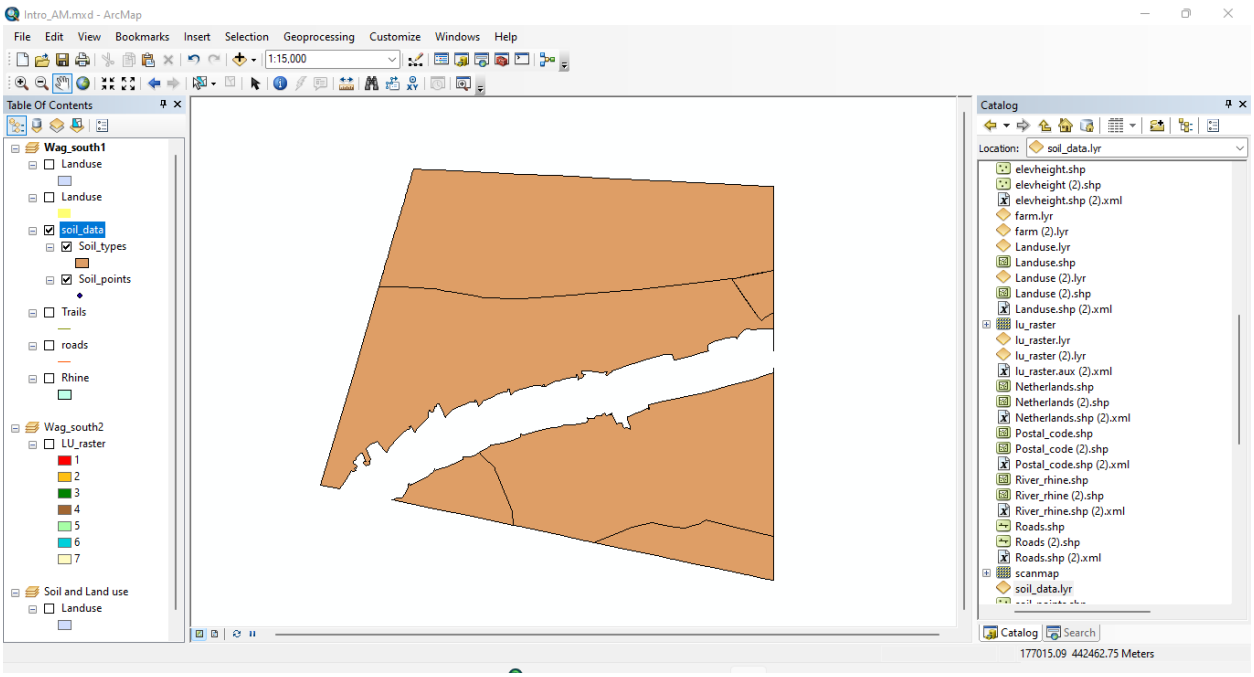
8.B :



8.C : I tried changing the color in the dataset 'Landuse.shp' nothing happens to the layer 'Landuse.lyr'



9.A :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File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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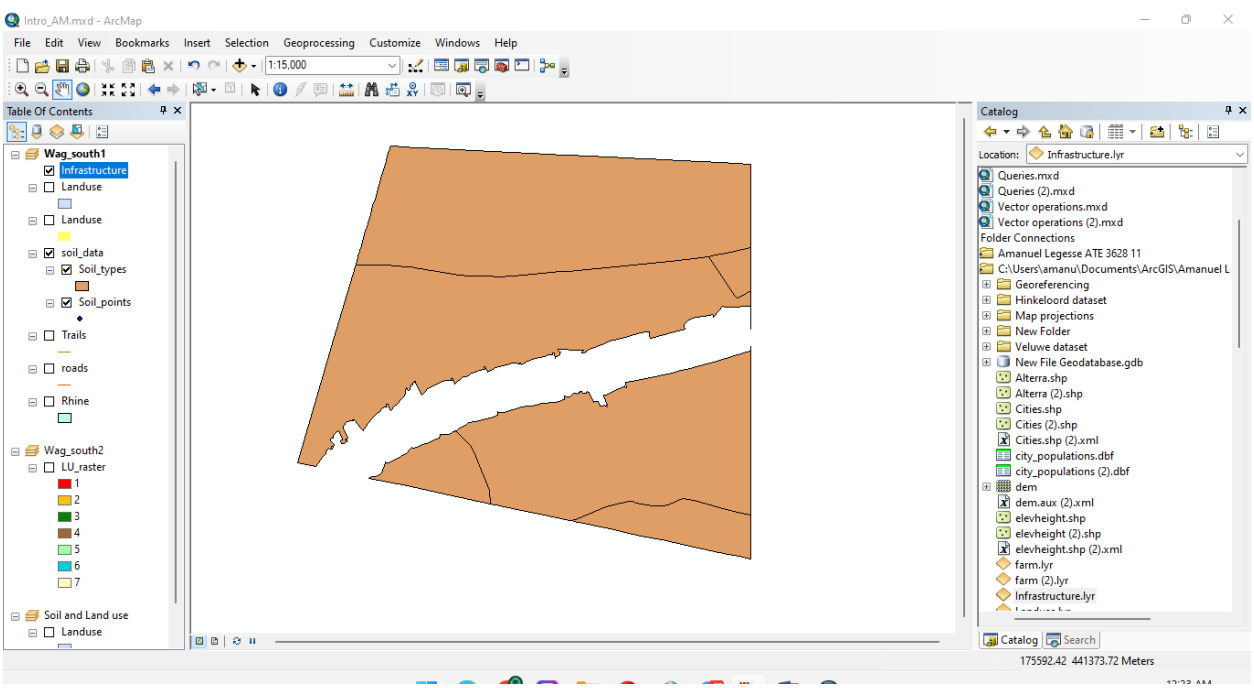
Roads.shp
Roads (2).shp
Roads.shp (2).xml
scanmap
soil_data.lyr
Catalog
Search
177015.09 442462.75 Meters

9.B: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Location: Infrastructure.lyr
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Vector operations (2).mxd
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Alterra.shp
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elevheight.shp
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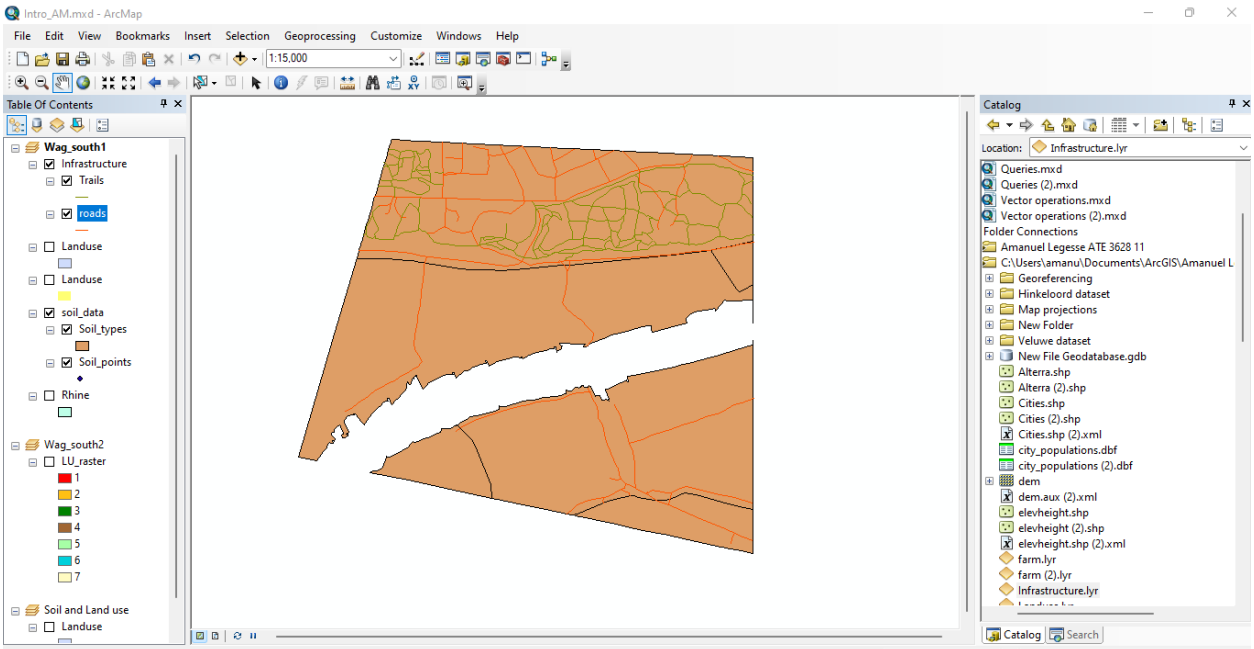
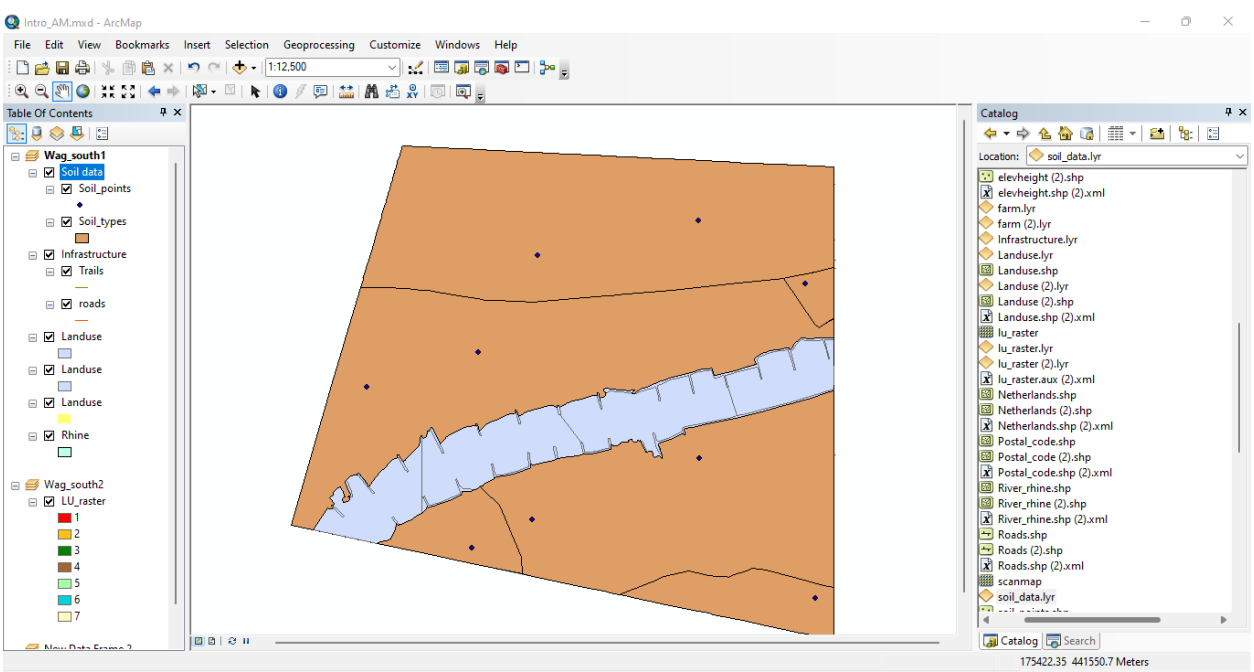
elevheight.shp (2).xml
farm.lyr
farm (2).lyr
Infrastructure.lyr
Catalog
Search
175592.42 441373.72 Meters

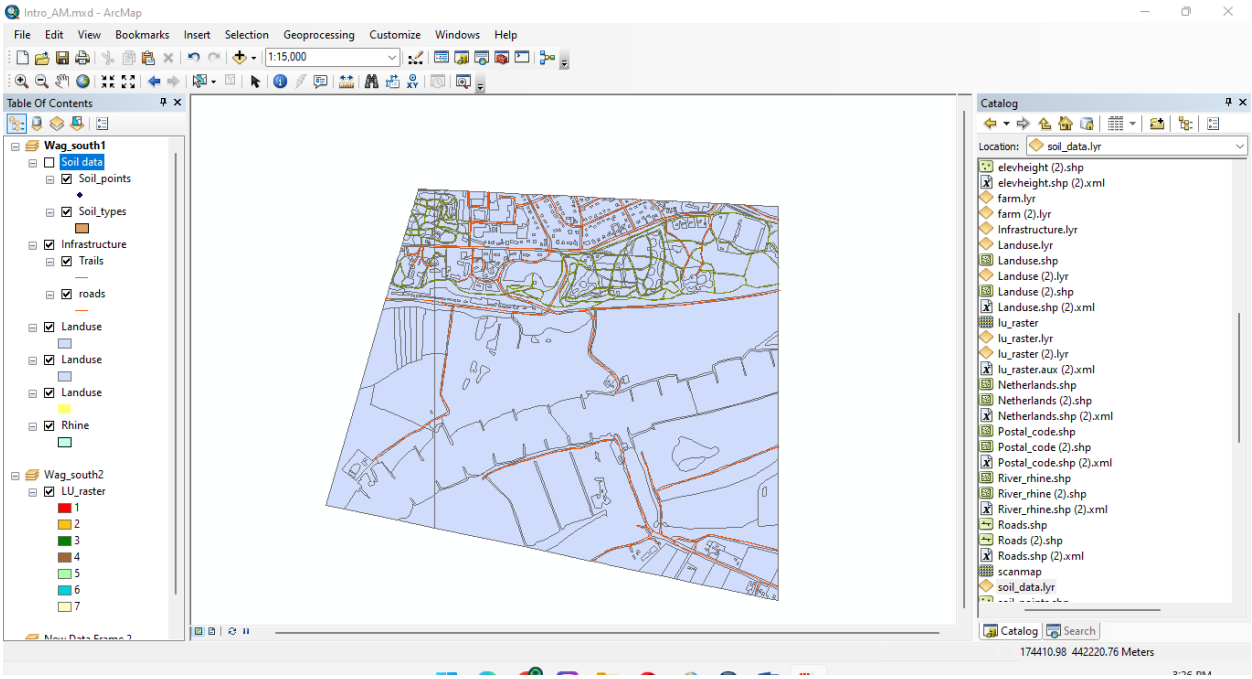
9.C :



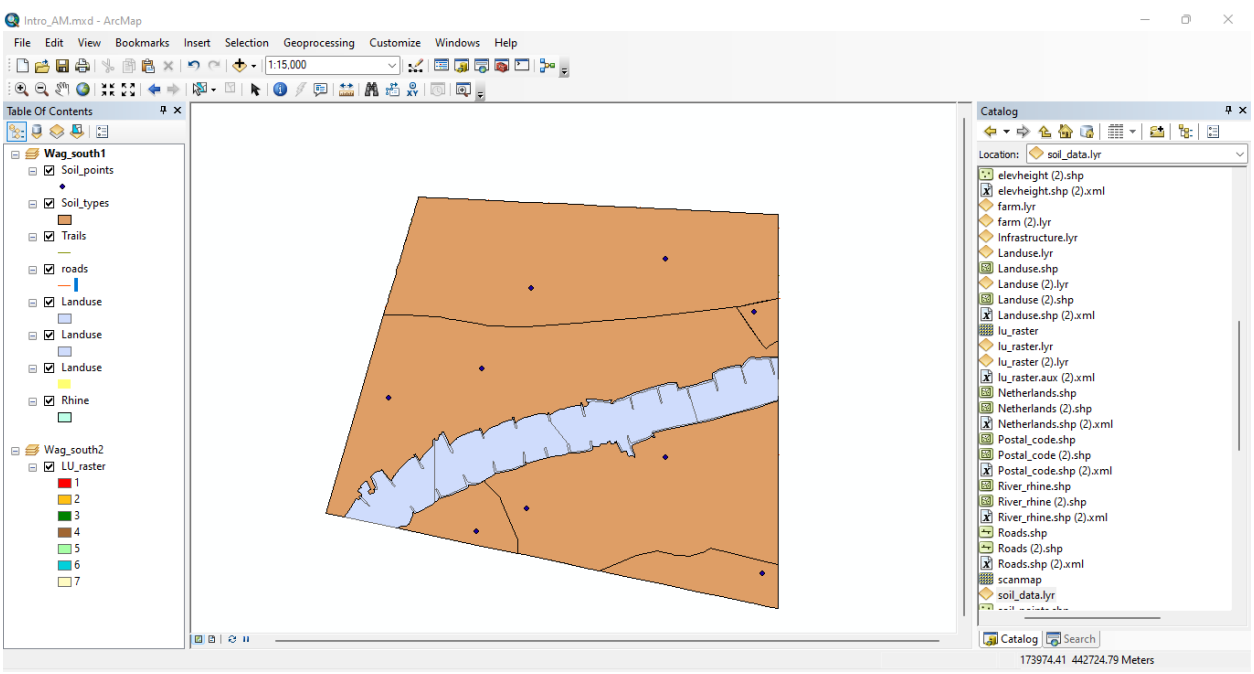
9.D : The other layers in the data set will disappear as if they have been deactivated but they are not, solid data will take over the infrastructure making the visibility on top hiding the other data sets



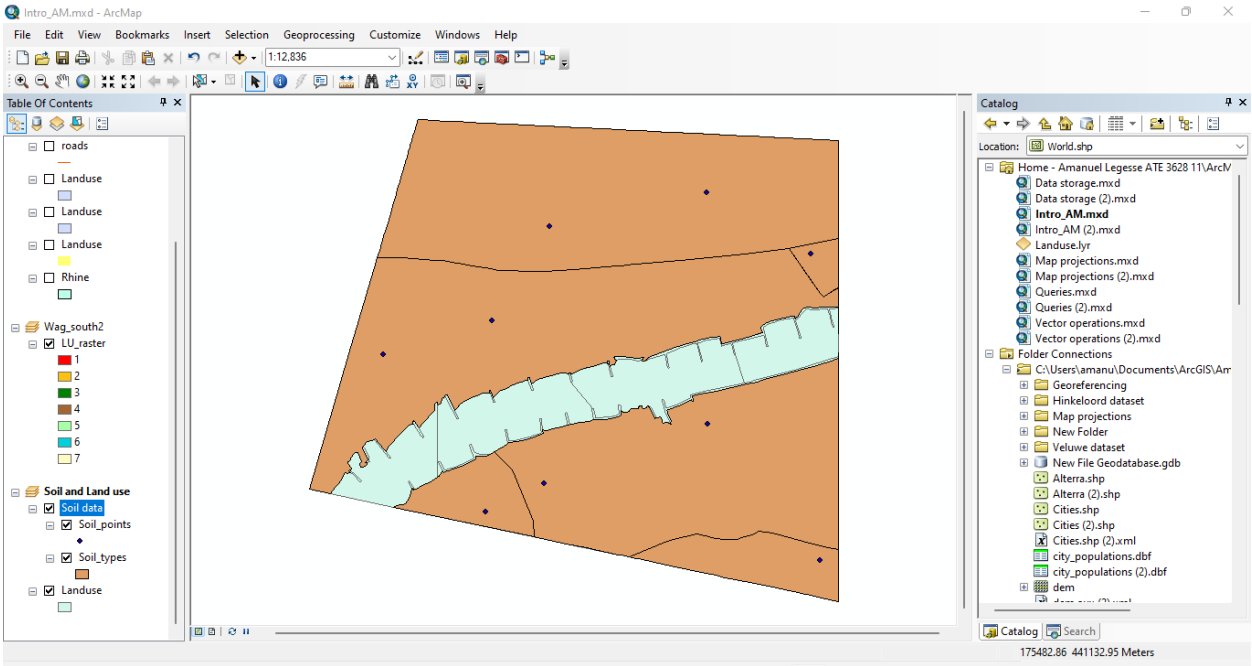
9.E : Roads and trails become visible because Solid data is deactivated since it was the primary data.



9.F :



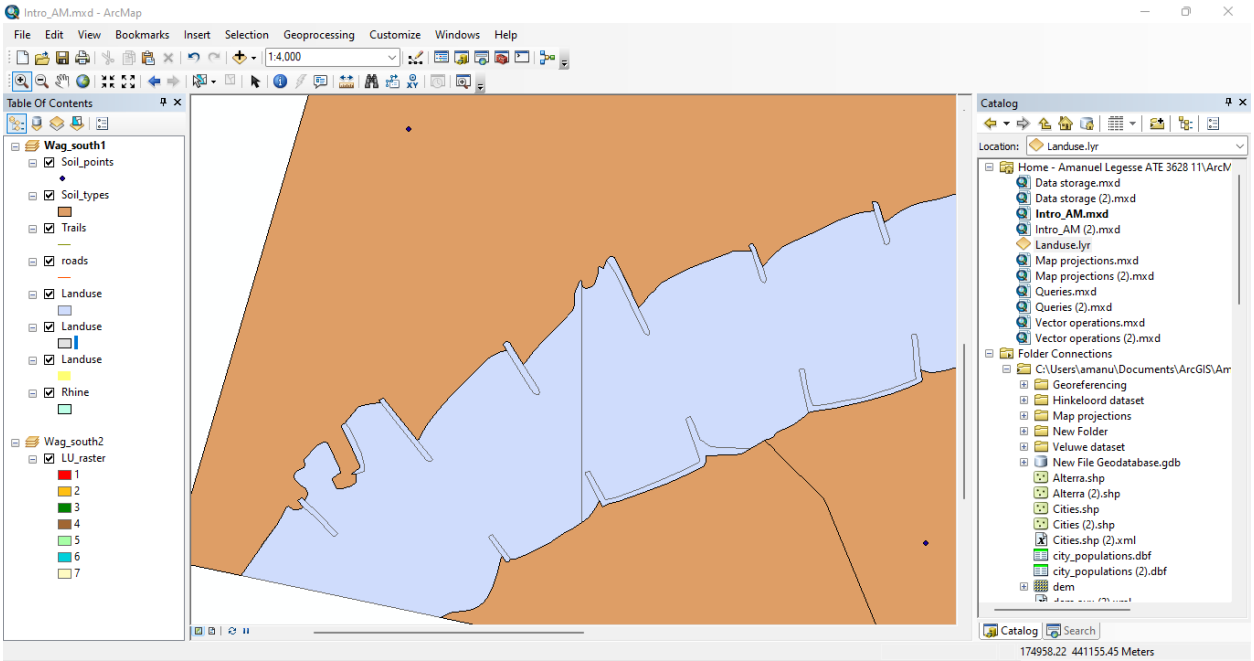
9.G :

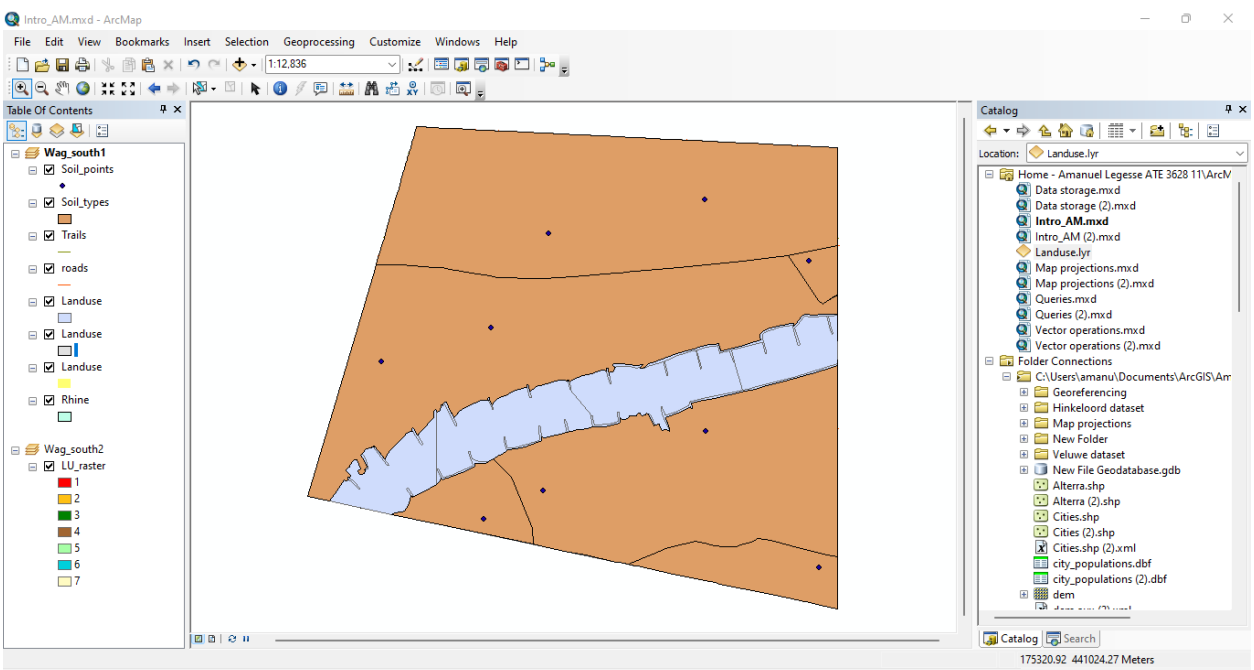


9.G : Removed the Data Frame ‘Soils and Land use’ from the ArcMap document.

Zooming in and out

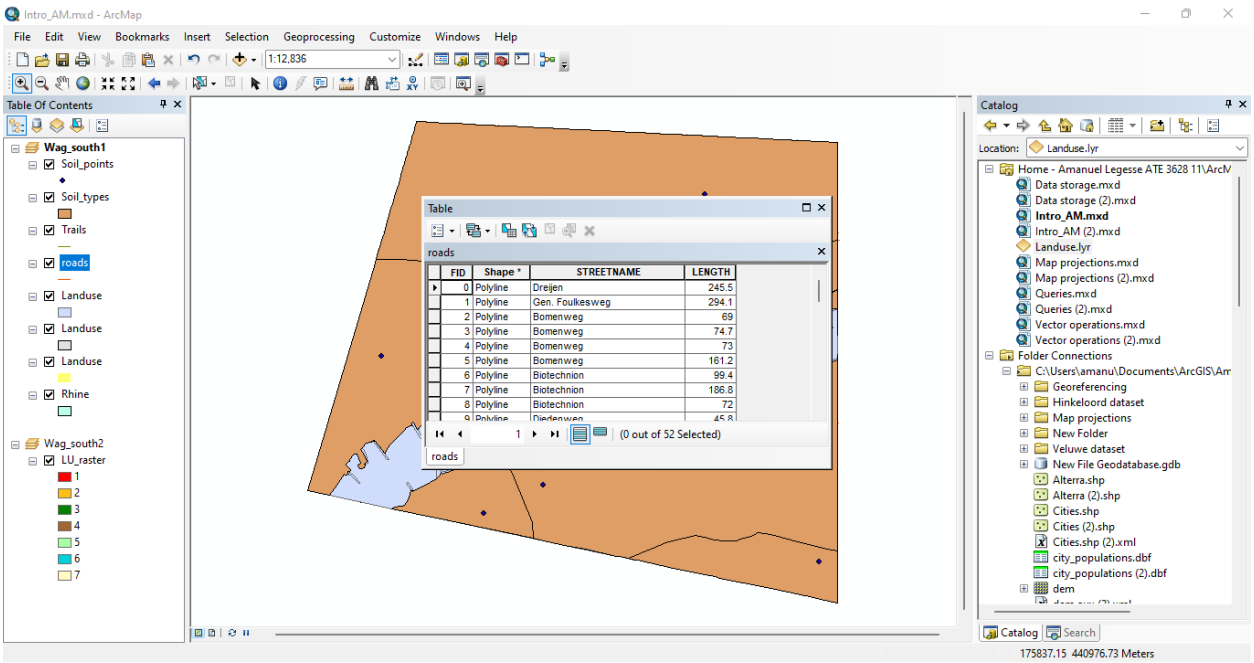
10.A :





Viewing a dataset's attribute table

11.A :



A.1

- The table contains a polyline feature type.

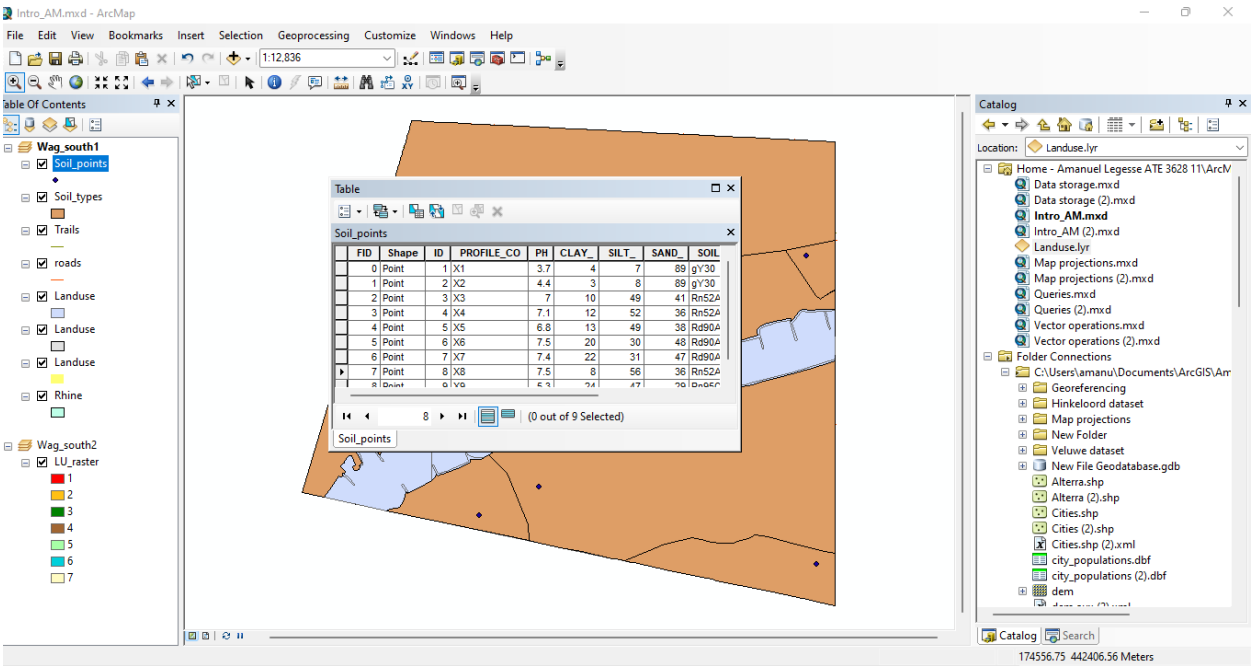
A.2

- There are 4 attributes. FID, shape, street name and length.

A.3

- The table contains 52 records.

11.A.1 :



B.1

- The table contains a points feature type.

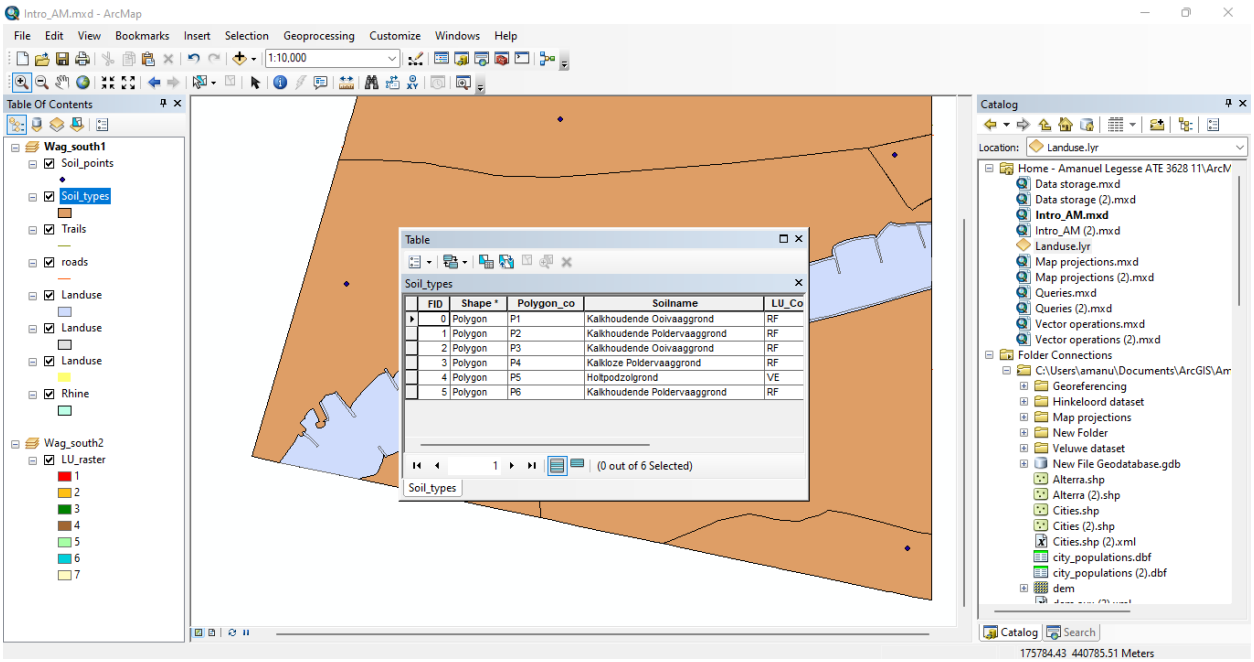
B.2

- There are 10 attributes. FID, ID, shape, profile_co, PPH, clay, silt, sand, soilcode and sc_ratio.

B.3

- The table contains 9 records.

11.B.1 :



B.1.1

- The table contains a polygon feature type.

B.2.1

- There are 8 attributes. FID, ID, shape, polygon_co, soliname, solicode, lu_code, A.

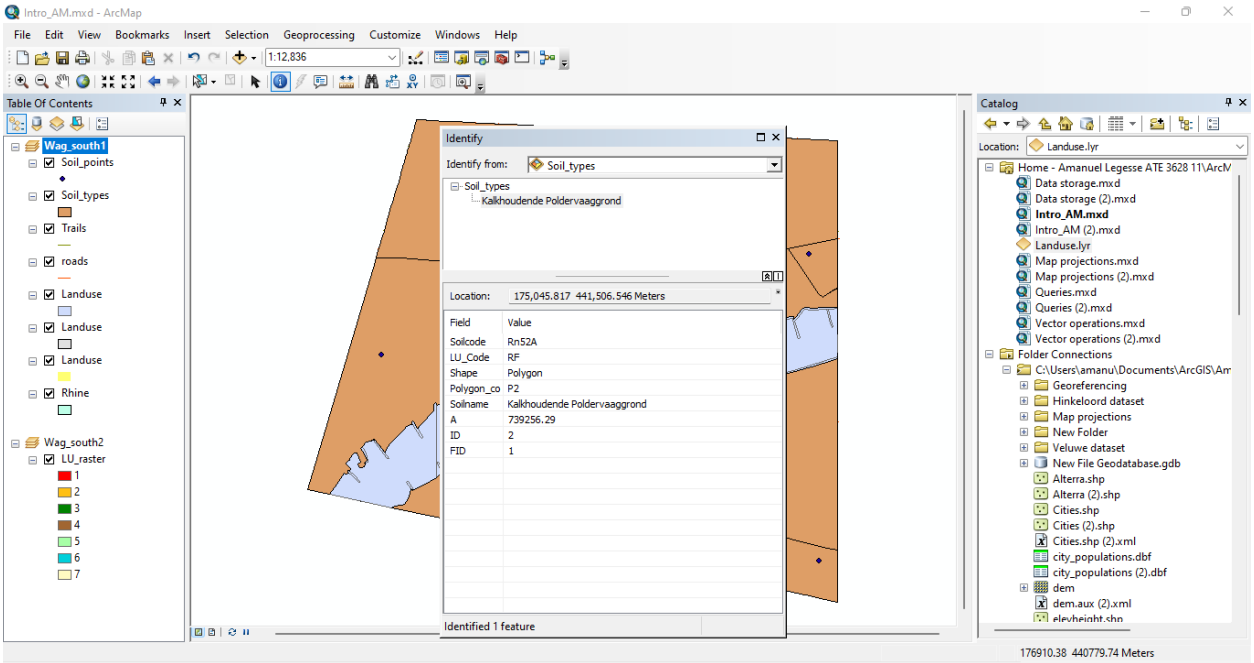
B.3.1

- The table contains 6 records.

11.C

- Each column represents a field of the record. Rows and columns intersect to form cells, which contain a specific value for one field in a record.

11.D :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1:12,836
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7
Identify
Identify from: Soil_types
Soil_types
Kalkhoudende Poldervaaggrond
Location: 175,045.817 441,506.546 Meters
Field Value
Soilcode Rn52A
LU_Code RF
Shape Polygon
Polygon_co P2
Soilname Kalkhoudende Poldervaaggrond
A 739256.29
ID 2
FID 1
Identified 1 feature
Catalog
Location: Landuse.lyr
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Cities.shp (2).xml
city_populations.dbf
city_populations (2).dbf
dem
dem.aux (2).xml
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12.A :

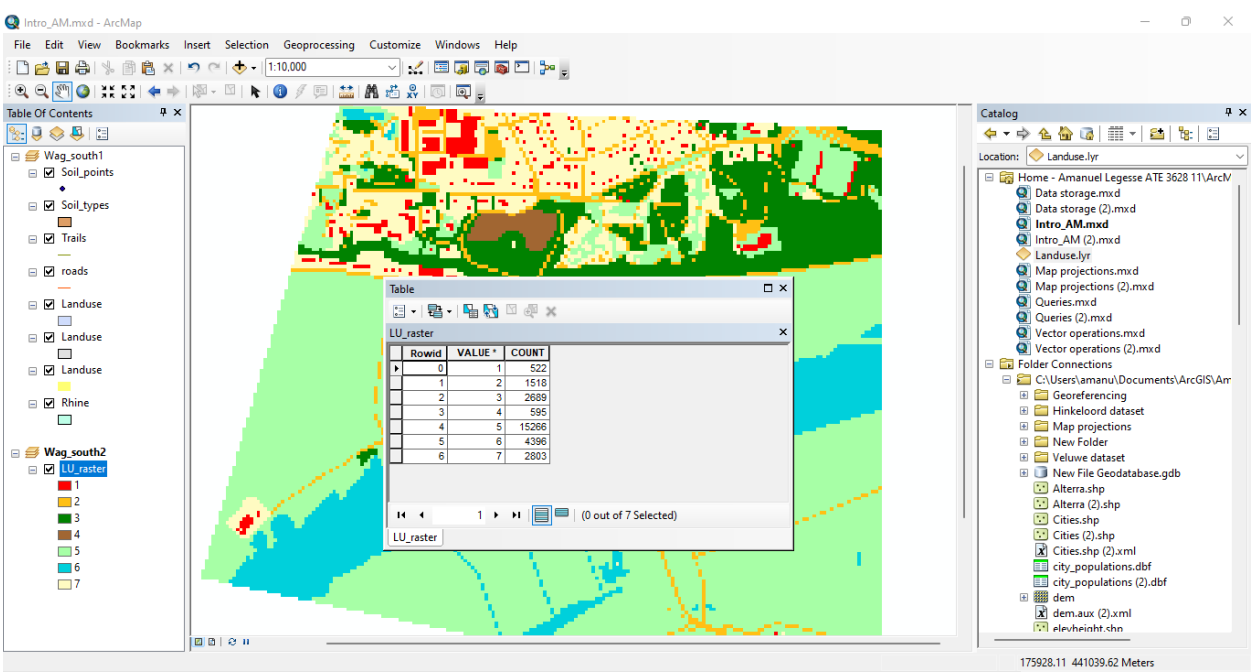
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Table
LU_raster
Rowid VALUE * COUNT
0 1 522
1 2 1518
2 3 2689
3 4 595
4 5 15266
5 6 4396
6 7 2803
1 (0 out of 7 Selected)
LU_raster
Catalog
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Cities (2).shp
Cities.shp (2).xml
city_populations.dbf
city_populations (2).dbf
dem
dem.aux (2).xml
175928.11 441039.62 Meters

- There are 3 attributes. Rowid, Value and count.

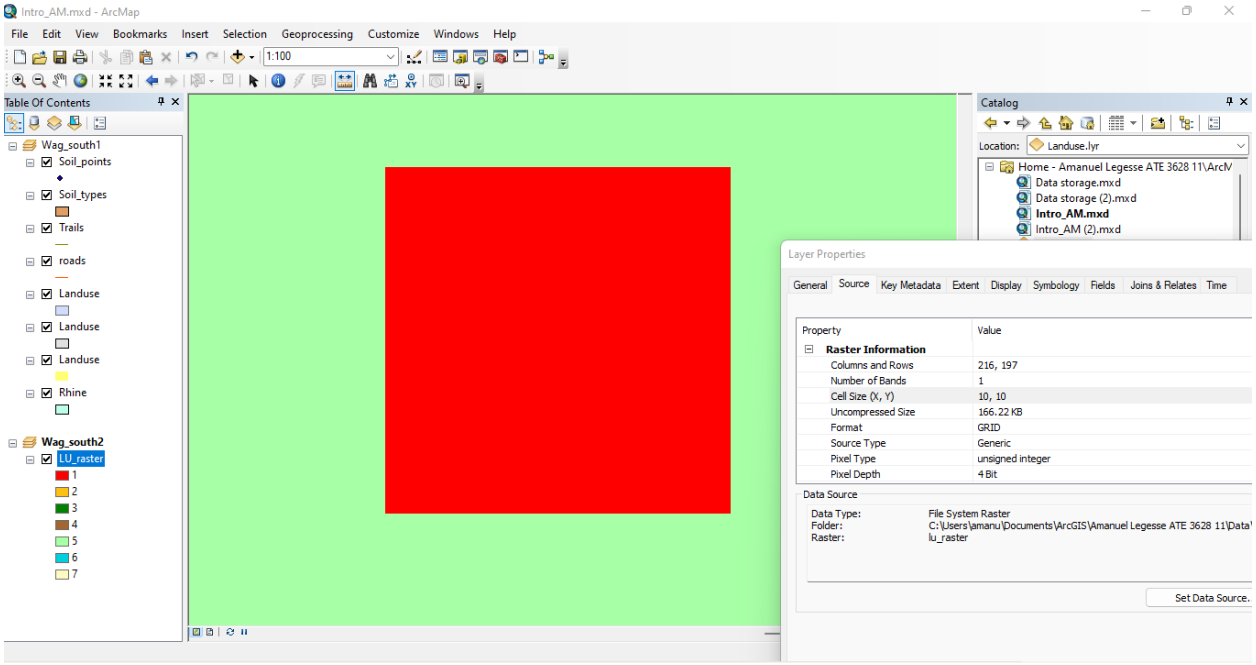
12.B:

- The table contains 7 records.

12.C:

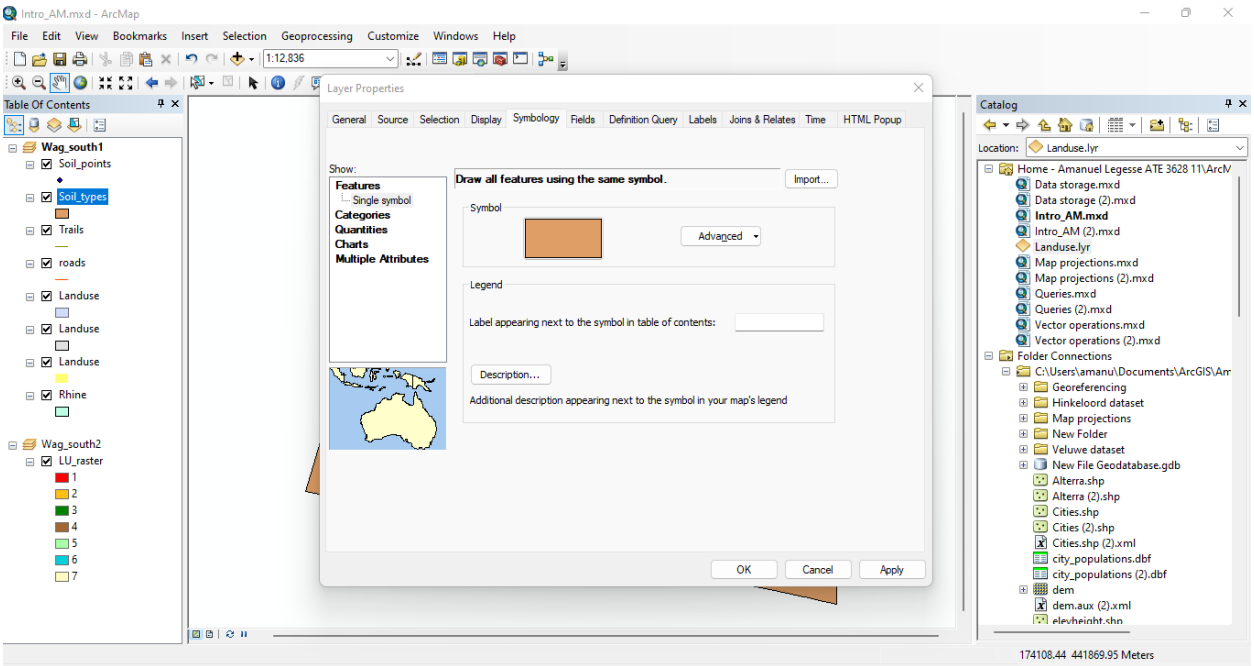
- **Count** command allows you to view the number of features in the map based on feature classes and subtypes.
- **Value** is a measurable quantity that may be passed to a function. Values are either assigned or determined by calculation.

12.D :



Symbolizing spatial vector data

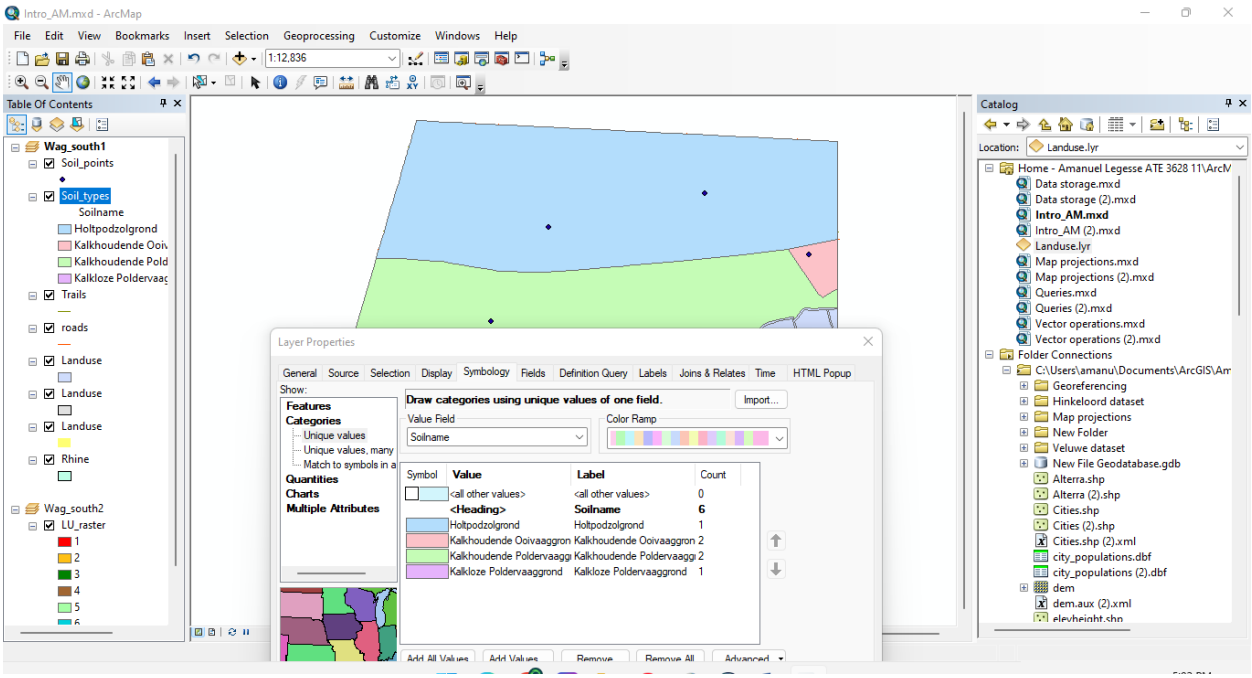
13.A :



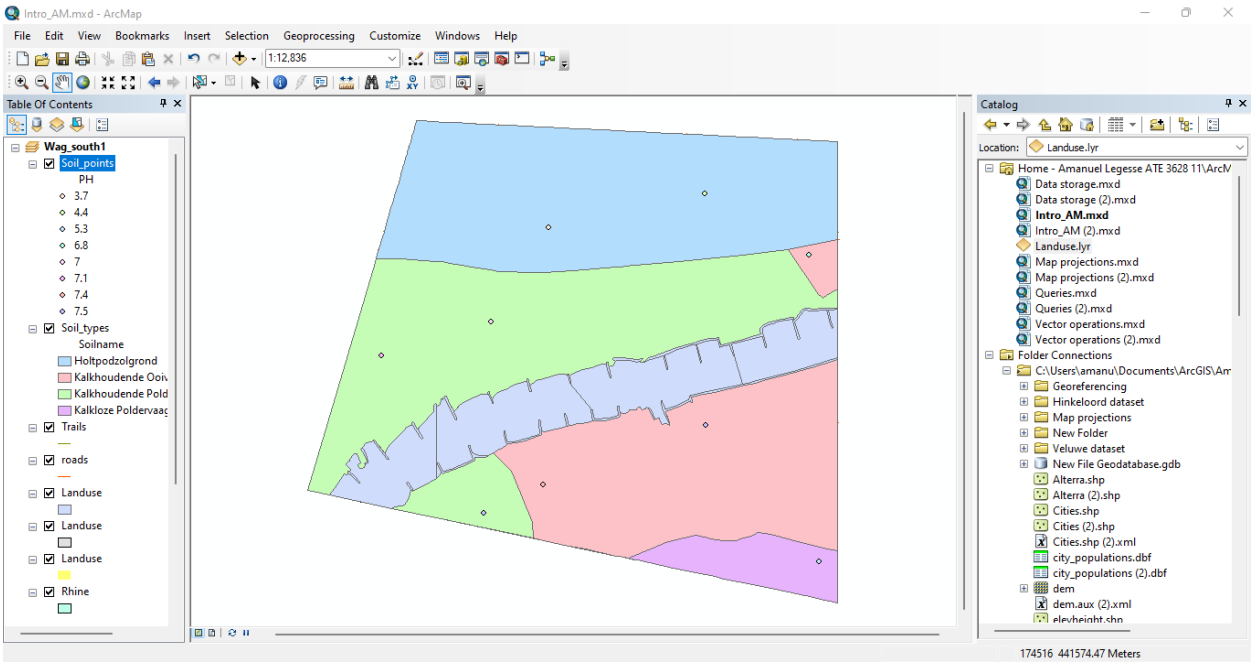
- The map type used is features.

13.B :

- I used the catagories – unique values map in order to choose the attribute to display on my map.



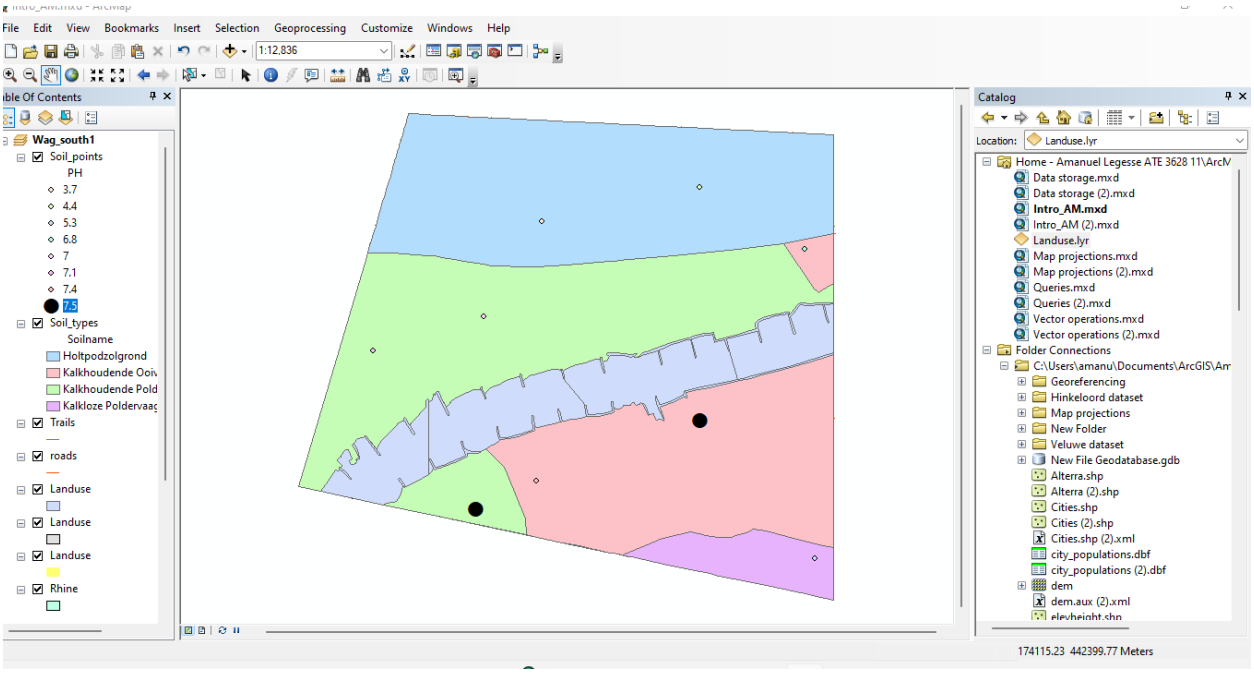
13.C :



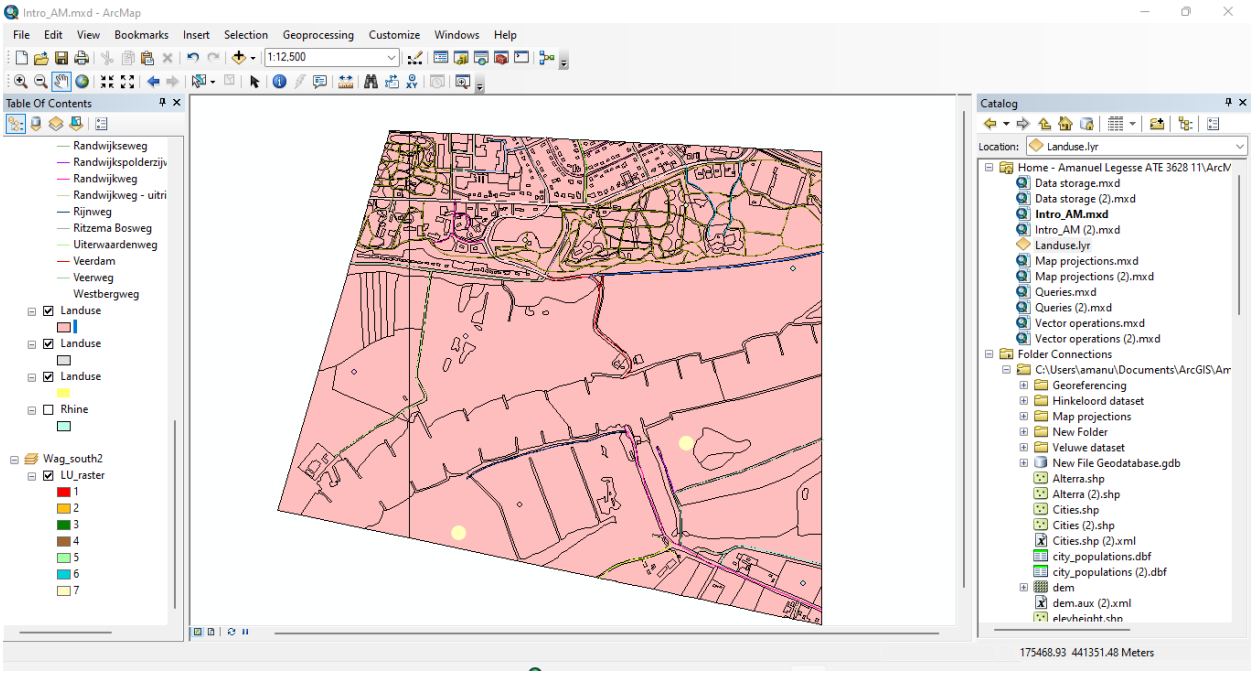
13.D :

- I used the catagories – unique values map in order to choose the attribute to display on my map.

13.E :



14.A :



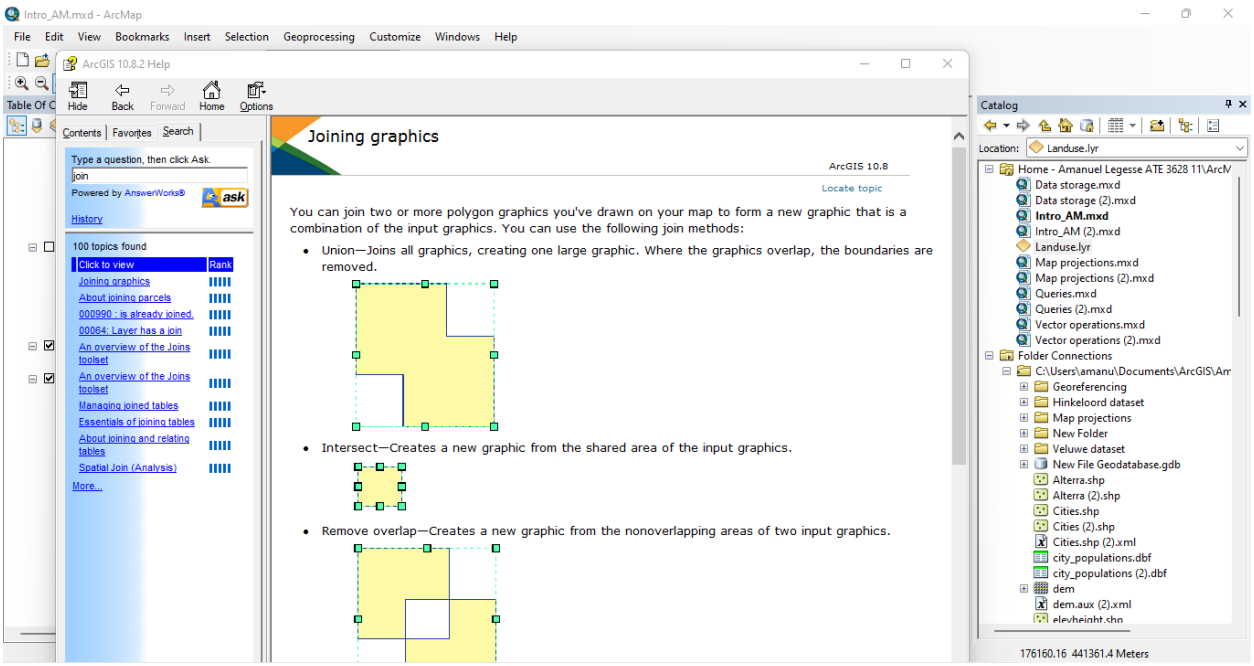
14.B

- The dataset contains 30 street names.

14.C:

- All the road features are polyline because features don’t depend on street names.

15.A :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ArcGIS 10.8.2 Help
Hide Back Forward Home Options
Contents Favorites Search
Type a question, then click Ask.
join
Powered by AnswerWorks®
ask
History
100 topics found
Click to view
Rank
Joining graphics
About joining parcels
000990 : is already joined.
00064: Layer has a join
An overview of the Joins toolset
An overview of the Joins toolset
Managing joined tables
Essentials of joining tables
About joining and relating tables
Spatial Join (Analysis)
More...
Joining graphics
ArcGIS 10.8
Locate topic
You can join two or more polygon graphics you've drawn on your map to form a new graphic that is a combination of the input graphics. You can use the following join methods:
Union—Joins all graphics, creating one large graphic. Where the graphics overlap, the boundaries are removed.
Intersect—Creates a new graphic from the shared area of the input graphics.
Remove overlap—Creates a new graphic from the nonoverlapping areas of two input graphics.
Catalog
Location: Landuse.lyr
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Data storage (2).mxd
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New File Geodatabase.gdb
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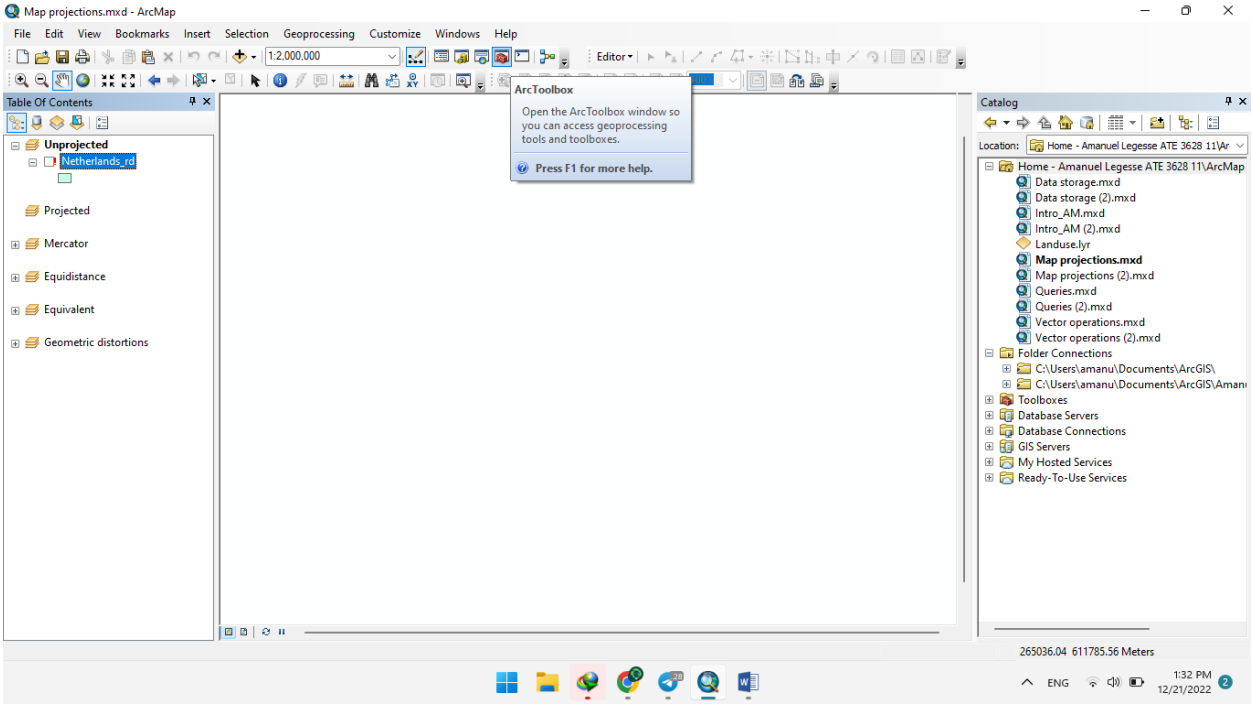
Alterra (2).shp
Cities.shp
Cities (2).shp
Cities.shp (2).xml
city_populations.dbf
city_populations (2).dbf
dem
dem.aux (2).xml
176160.16 441361.4 Meters

15.B: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ArcToolbox
Open the ArcToolbox window so you can access geoprocessing tools and toolboxes.
Press F1 for more help.
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Database Servers
Database Connections
GIS Servers
My Hosted Services
Ready-To-Use Services
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12/21/2022

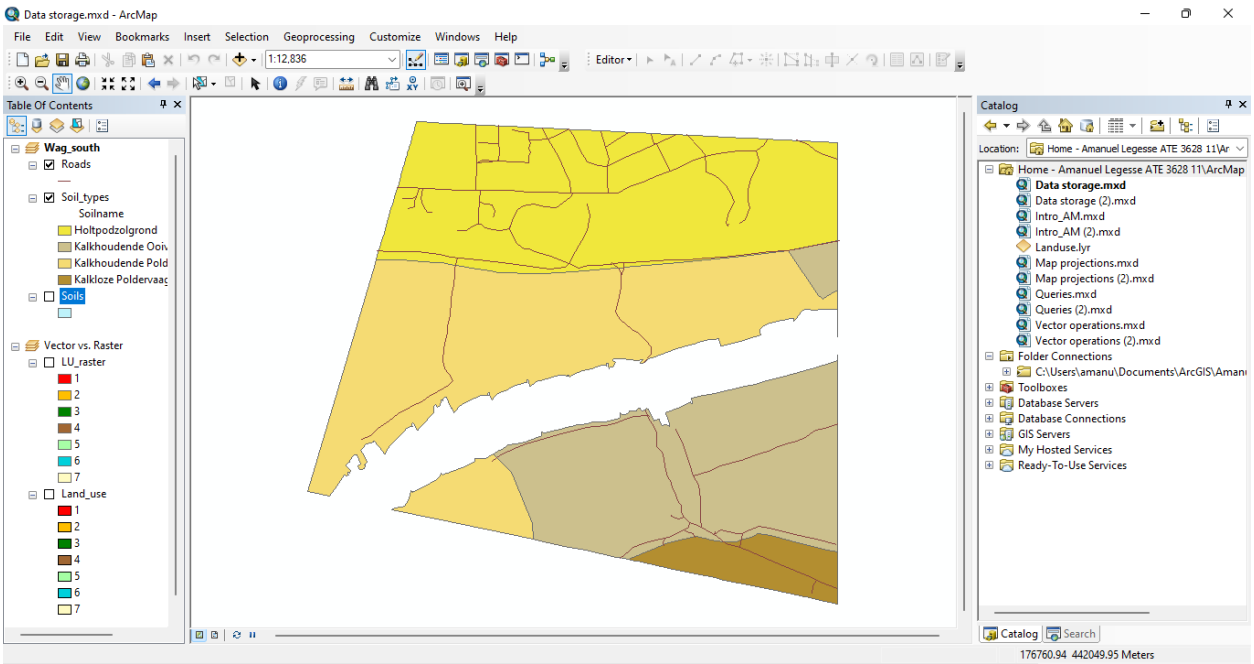
ARC-GIS

EXCERCISE: 2

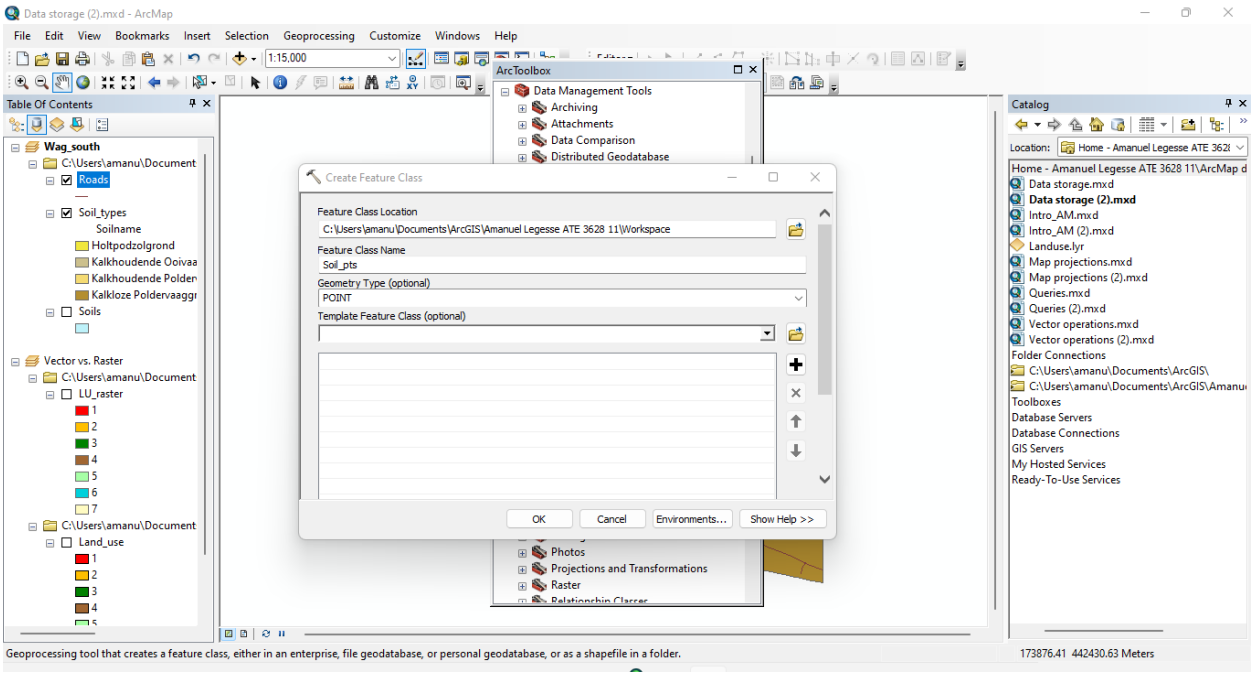
ArcGIS

ACREATING A DATASET

1.1:



1.A: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File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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Kalkhoudende Polder
Kalkloze Poldervaaggr
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C:\Users\amanu\Documents\ArcGIS\Amanuel Legesse ATE 3628 11\Workspace
Feature Class Name
Soil_pts
Geometry Type (optional)
POINT
Template Feature Class (optional)
OK
Cancel
Environments...
Show Help >>
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Toolboxes
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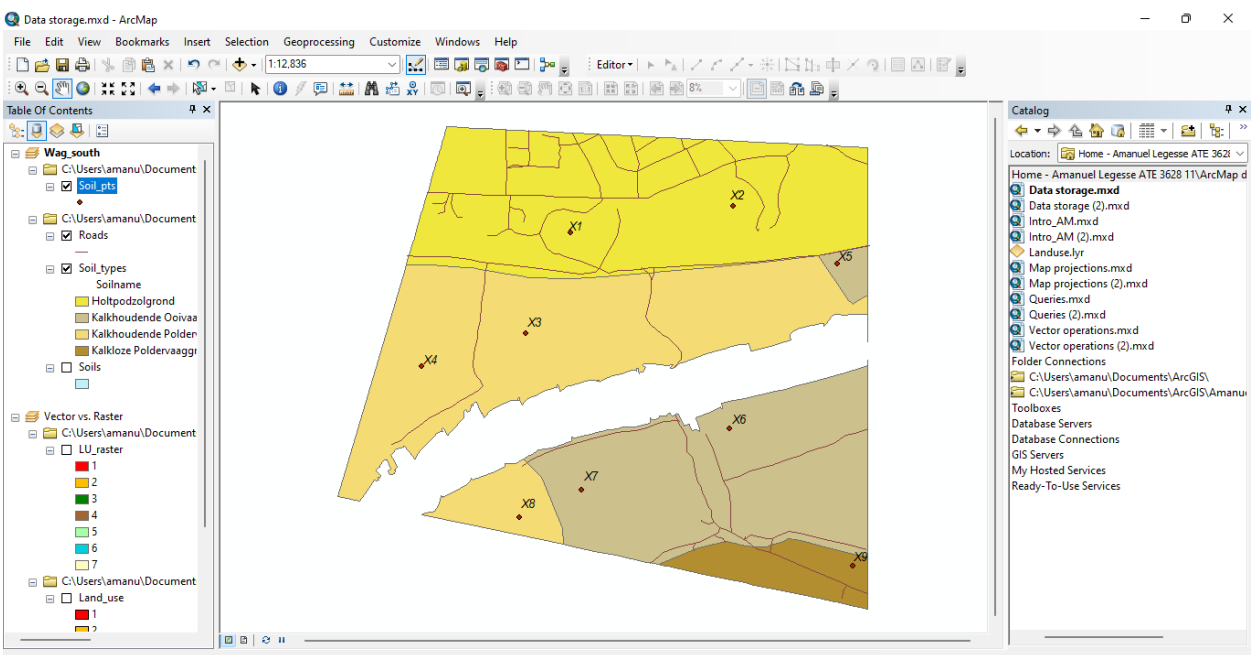
Ready-To-Use Services
Geoprocessing tool that creates a feature class, either in an enterprise, file geodatabase, or personal geodatabase, or as a shapefile in a folder.
173876.41 442430.63 Meters

1.B:


Data storage.mxd - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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Kalkhoudende Polder
Kalkloze Poldervaaggr
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Map projections (2).mxd
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Vector operations (2).mxd
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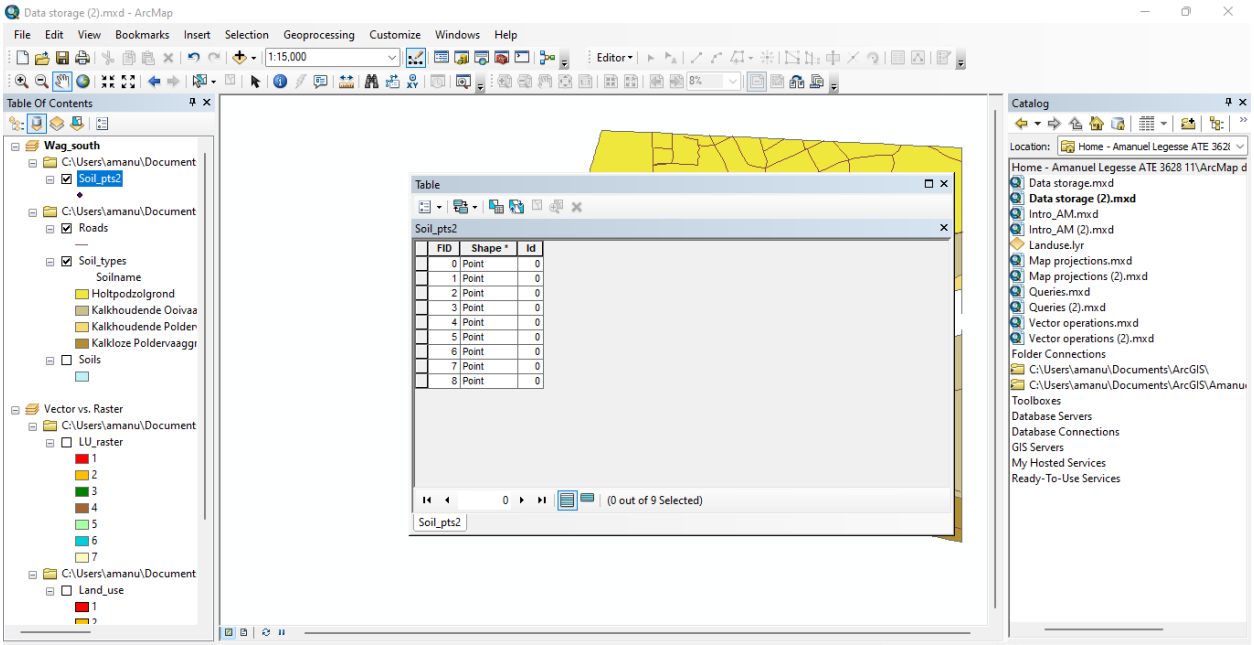
1.C: The attribute table of dataset ‘Soil_pts’ contains 9 records.



Adding attributes to point features

2.A

FLOAT - Numeric values with fractional values within a specific range

Integer - Numeric values without fractional values within specific range

TEXT data - Type stores any kind of text data. It can contain both single-byte and multi byte characters that the locale supports.

The date data type **can store dates, times, or dates and times**. The default format in which the information is presented is mm/dd/yyyy hh:mm:ss and a specification of AM or PM.

Data storage.mxd - ArcMap

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InsertCursor (arcpy.da)	
Add Field ToolValidator	
Working with fields in shapefiles by adding a field in ArcMap	
Working with fields in shapefiles by adding a field in ArcCatalog	
ArcGIS field data types	

More...

Note: Moving data from one database to another can cause data types to remap.

Learn how data converts from one type to another

File geodatabase data types are the same as ArcGIS data types. For DBMS products, though, data types can differ. The following sections contain information on how DBMS data types map to ArcGIS data types.

Access data types

When you create a feature class or table in ArcGIS, there are 11 different data types available for each column. These types are mapped to Access data types in the following table.

ArcGIS data type	Access data type	Notes
OBJECTID	Long Integer	OBJECTID is an AutoNumber field.
SHORT INTEGER	Integer	
LONG INTEGER	Long Integer	
FLOAT	Single	
DOUBLE	Double	
TEXT	Text	
DATE	Date/Time	
BLOB	OLE Object*	
GUID	Number	Replication ID, duplicates allowed
GEOMETRY	OLE Object*	
RASTER	Long Integer	

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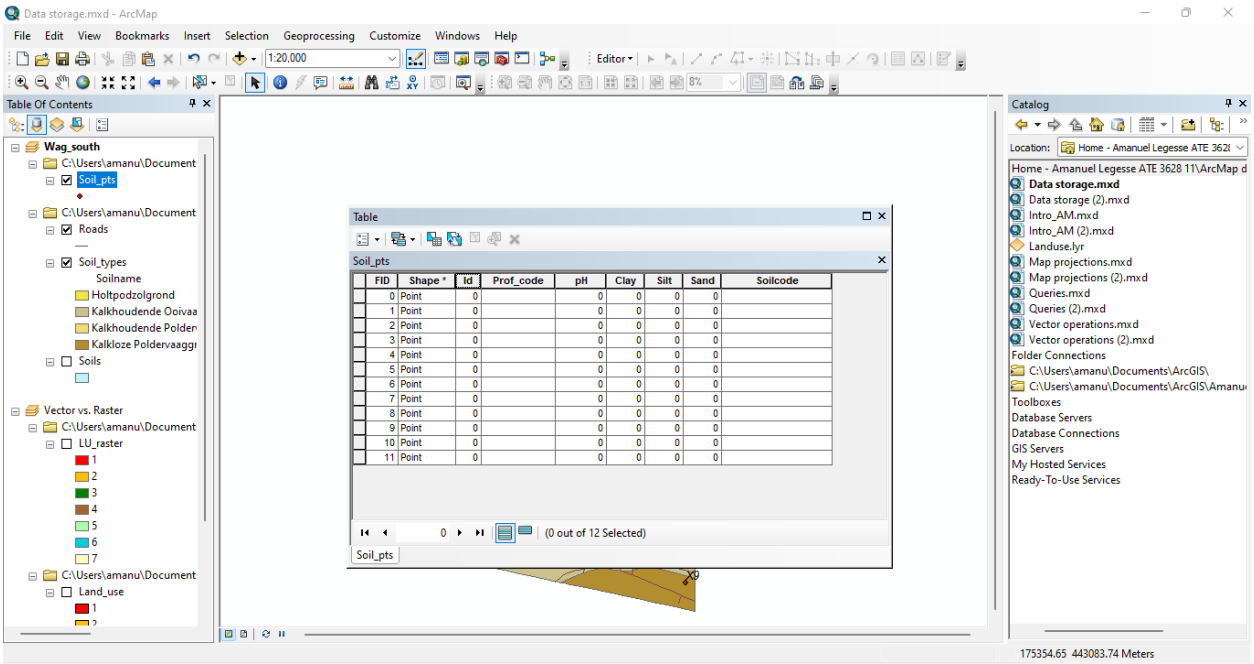
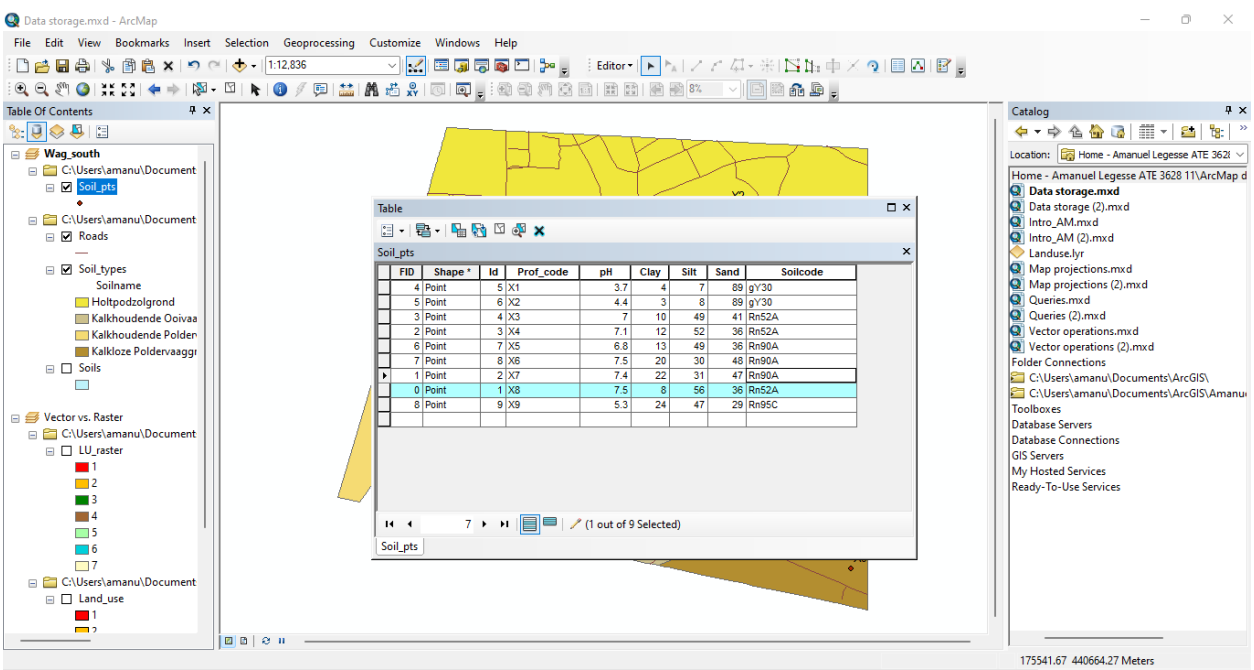
2.B:



FID	Shape *	Id	Prof_code	pH	Clay	Silt	Sand	Soilcode
0	Point	0		0	0	0	0	
1	Point	0		0	0	0	0	
2	Point	0		0	0	0	0	
3	Point	0		0	0	0	0	
4	Point	0		0	0	0	0	
5	Point	0		0	0	0	0	
6	Point	0		0	0	0	0	
7	Point	0		0	0	0	0	
8	Point	0		0	0	0	0	
9	Point	0		0	0	0	0	
10	Point	0		0	0	0	0	
11	Point	0		0	0	0	0	

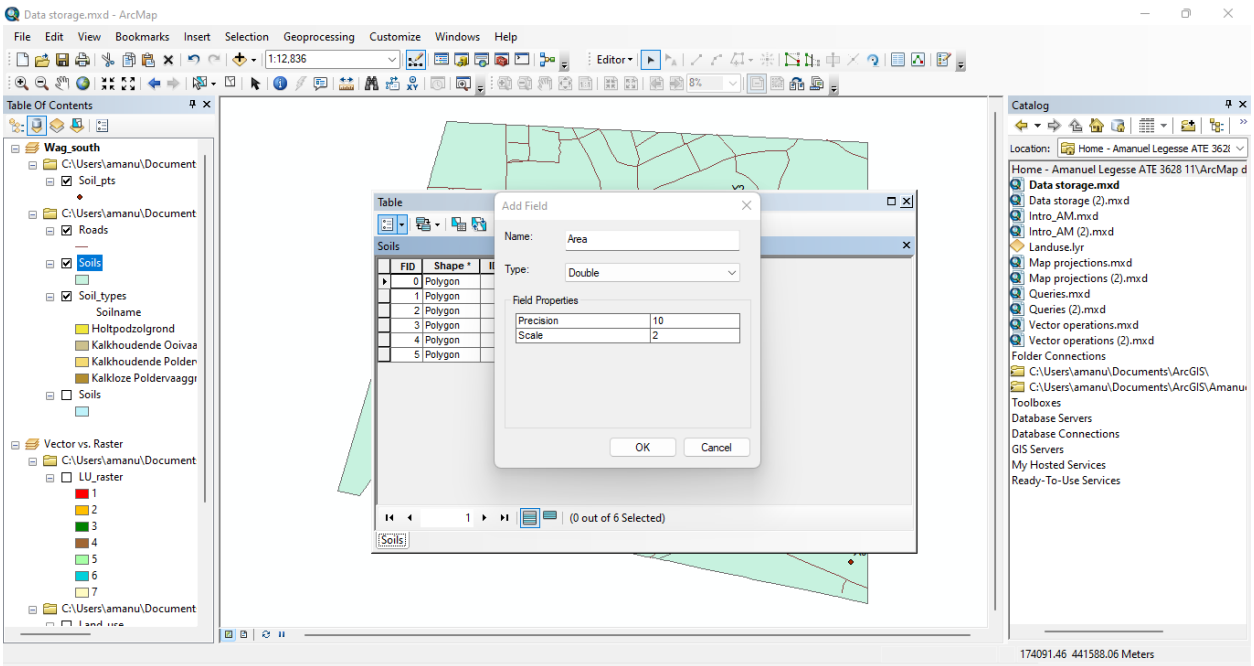
2.C:

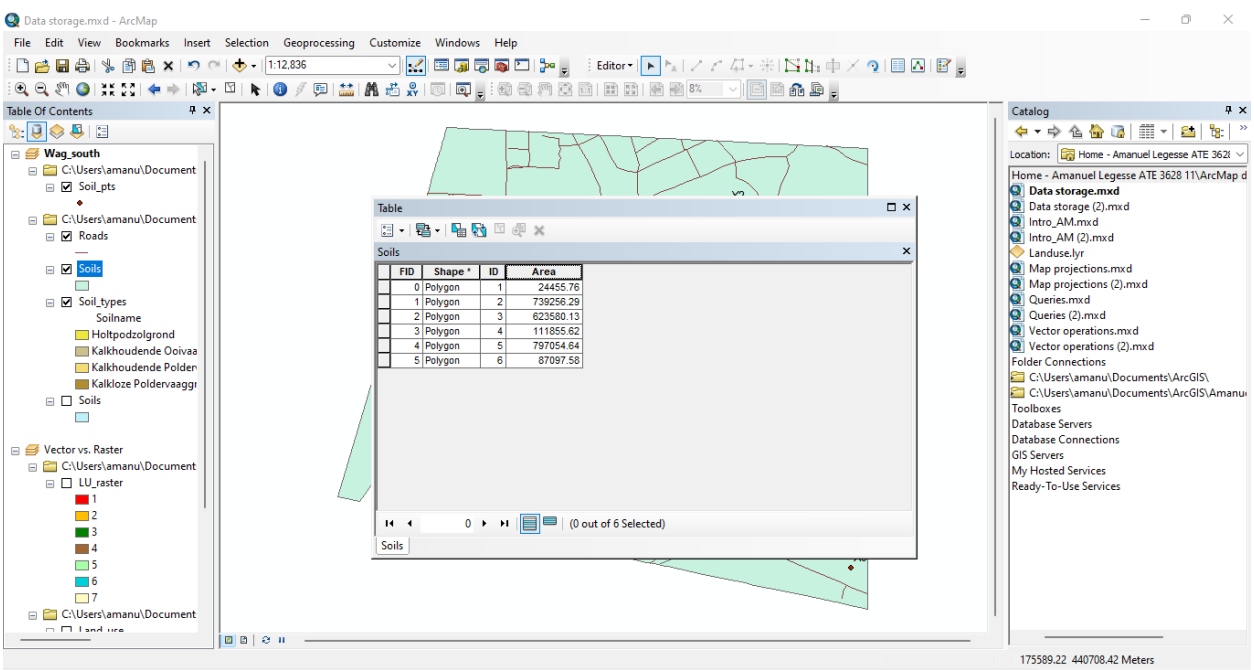


FID	Shape *	Id	Prof_code	pH	Clay	Silt	Sand	Soilcode
4	Point	5	X1	3.7	4	7	89	gY30
5	Point	6	X2	4.4	3	8	89	gY30
3	Point	4	X3	7	10	49	41	Rn52A
2	Point	3	X4	7.1	12	52	36	Rn52A
6	Point	7	X5	6.8	13	49	36	Rn90A
7	Point	8	X6	7.5	20	30	48	Rn90A
1	Point	2	X7	7.4	22	31	47	Rn90A
0	Point	1	X8	7.5	8	56	36	Rn52A
8	Point	9	X9	5.3	24	47	29	Rn95C

Calculating the area of polygon features

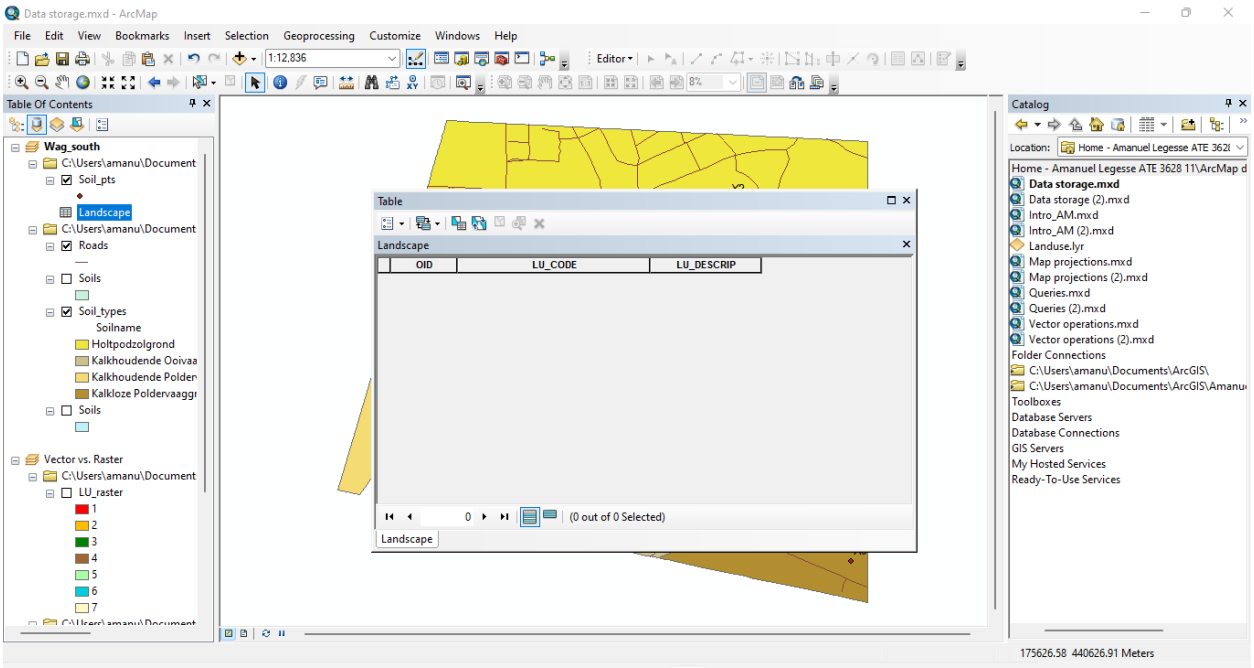
3.A:



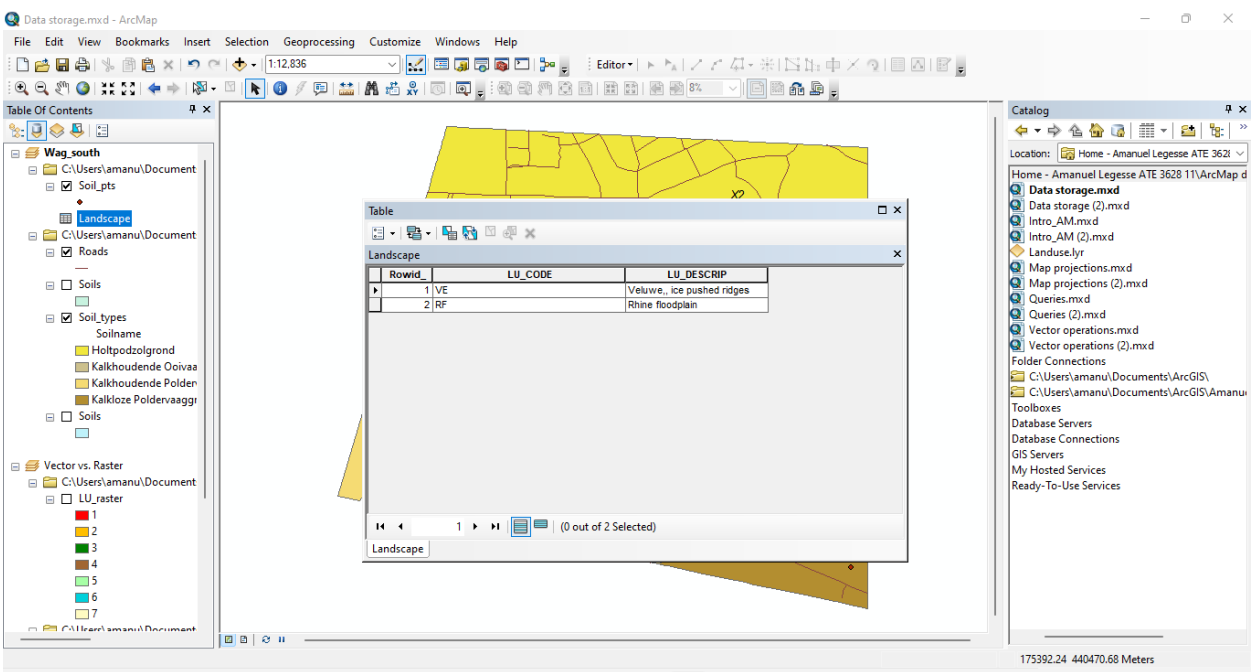


Creating a new table

4.A:

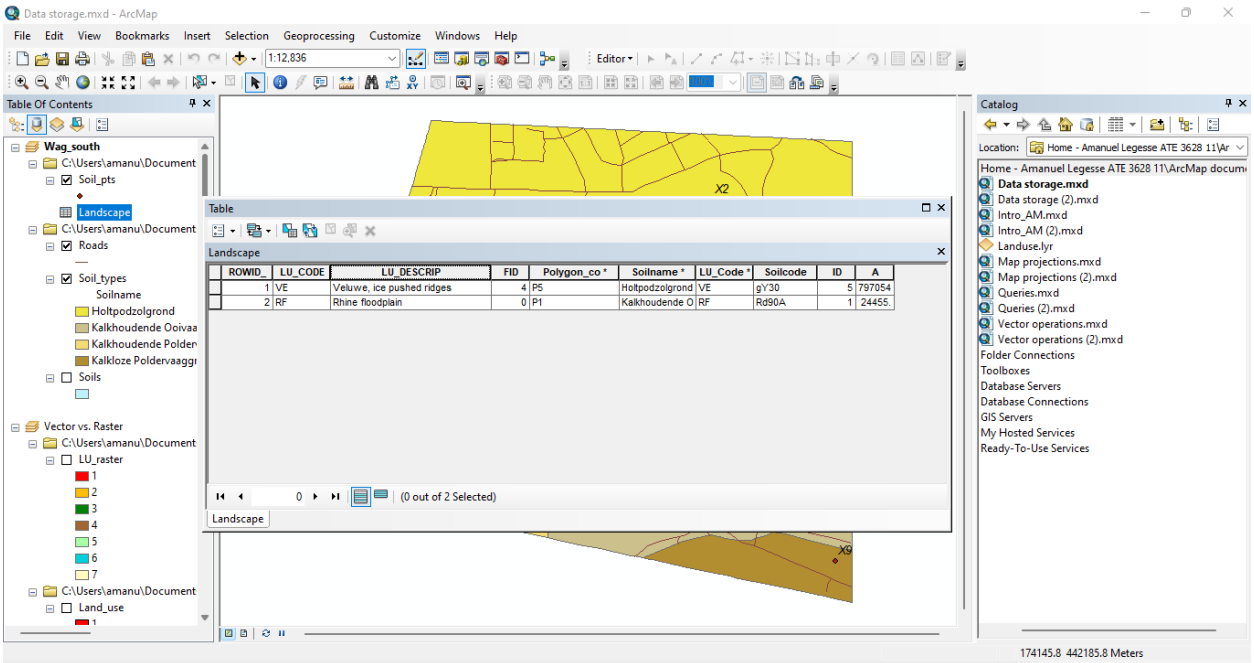


4.B:

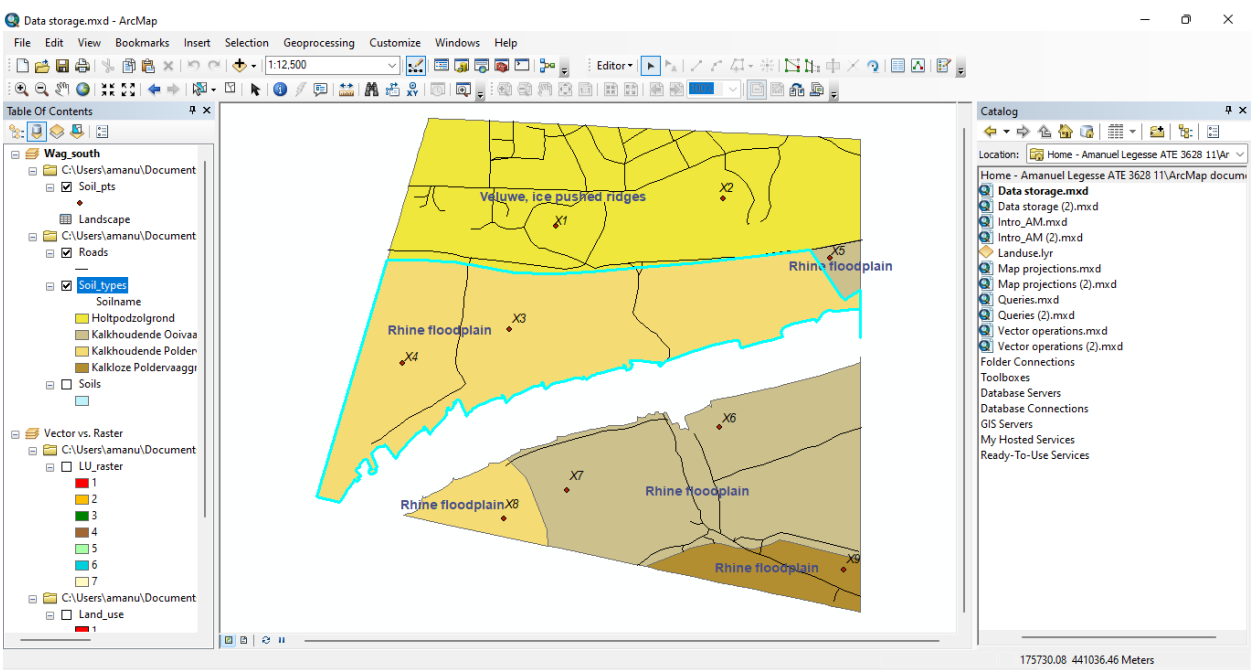


Joining tables

5.A:

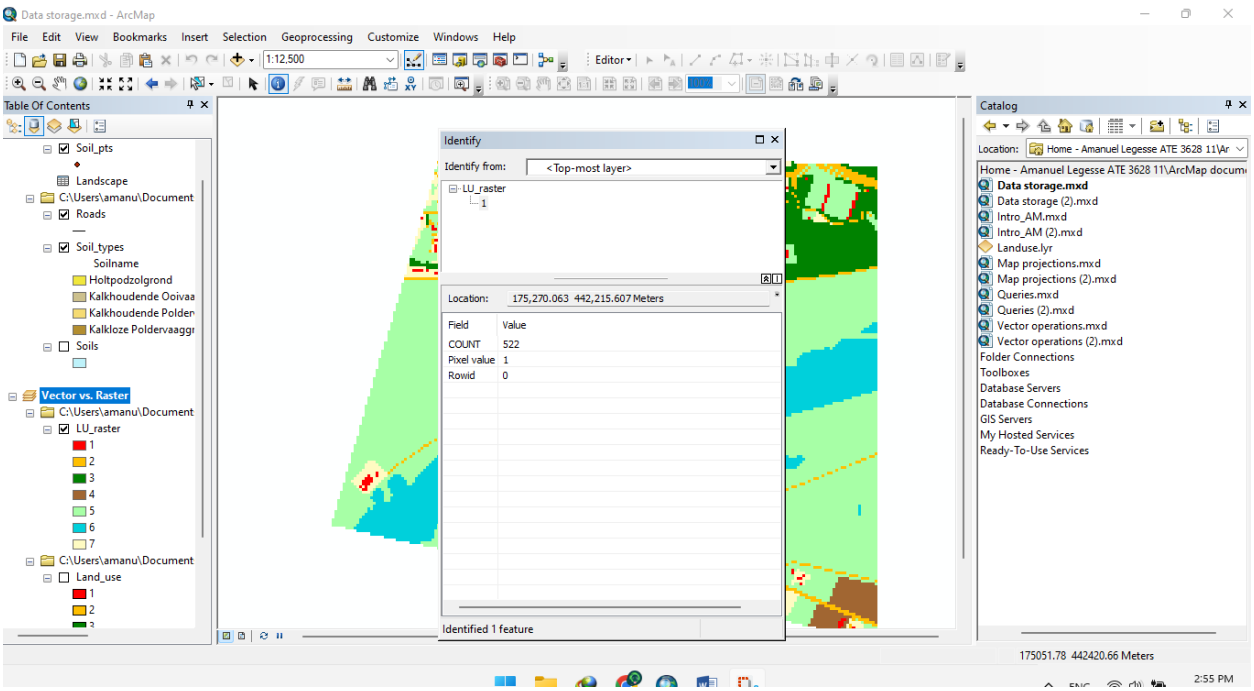


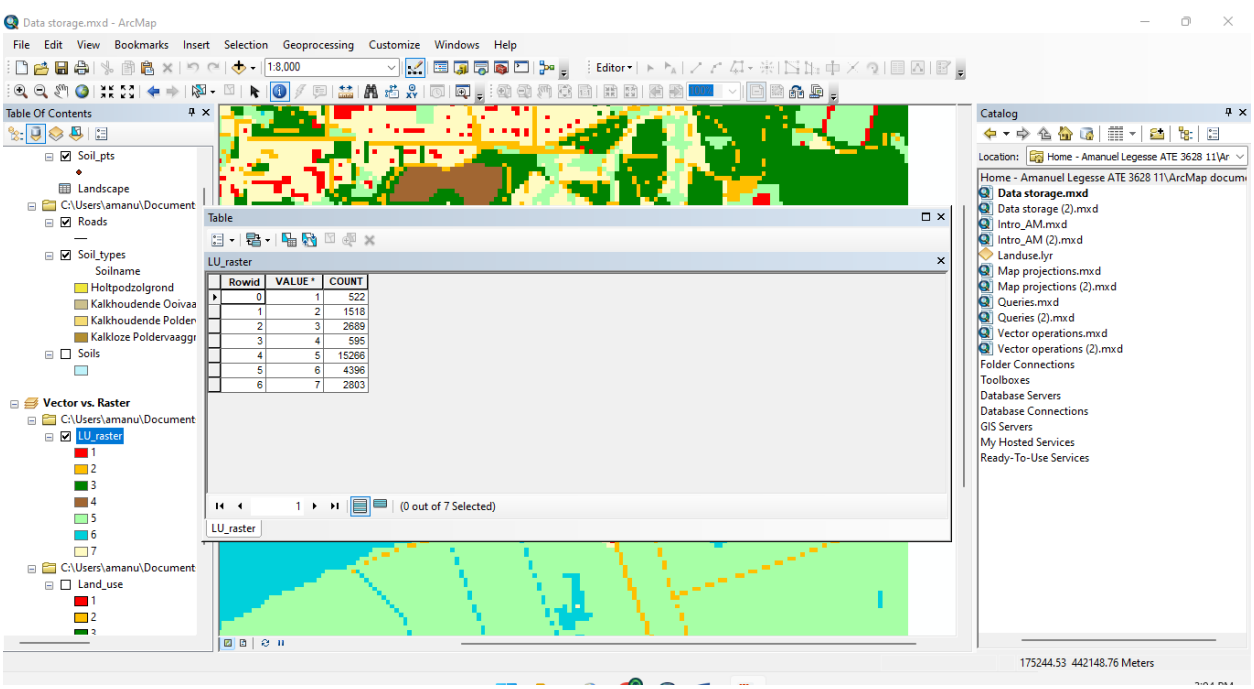
5.B



Data structure of a raster dataset

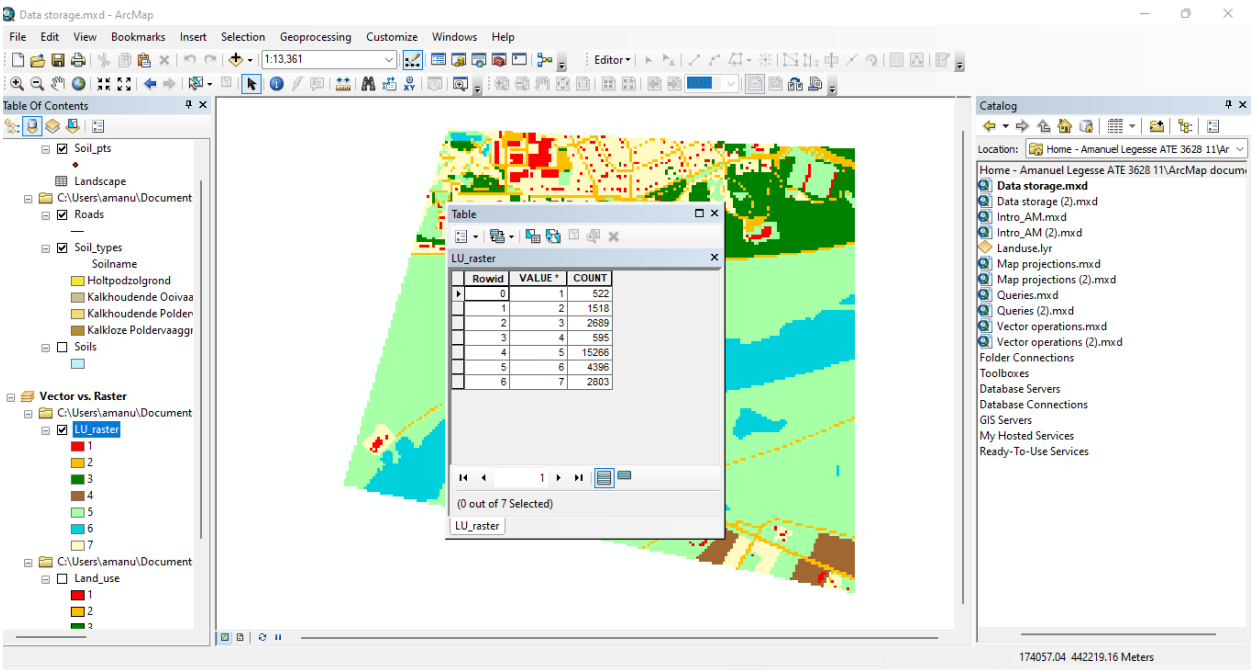
6.A: The raster attributes of 'LU_raster' are create out integer having an associated raster cell value attribute table.





6.B: LU_raster is a discrete geographic features that have definable boundaries because it features lakes, lands, buildings, roads…

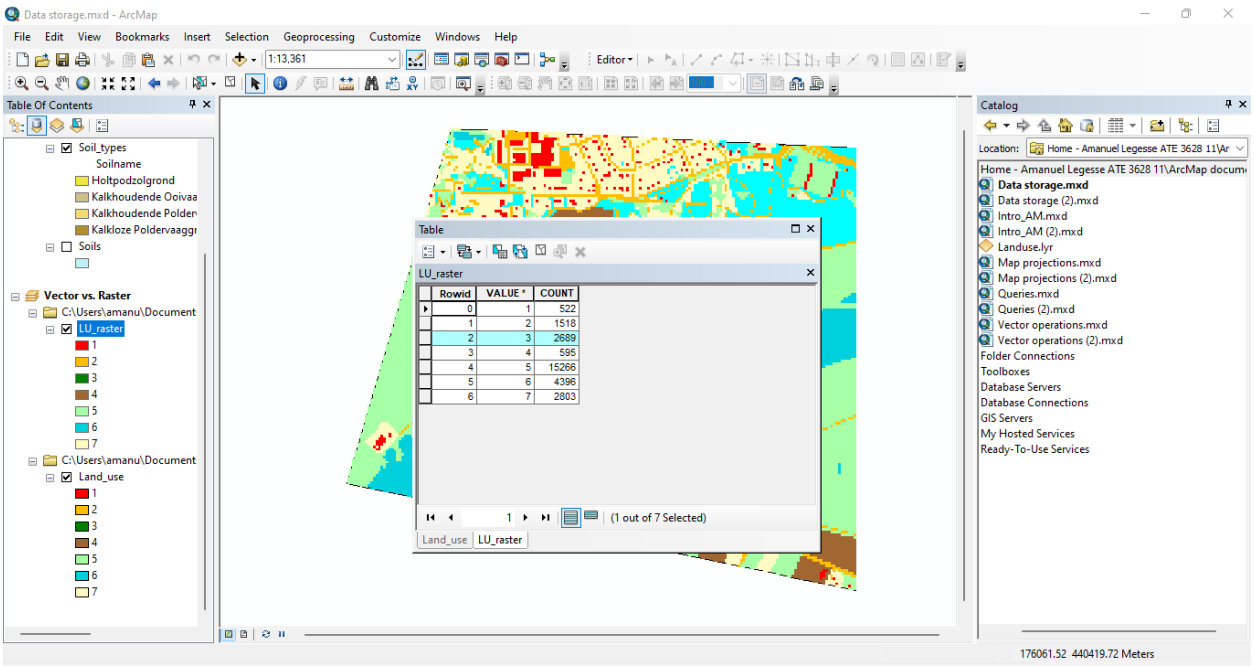
6.C: The attribute table of 'LU_raster' contains 7 values

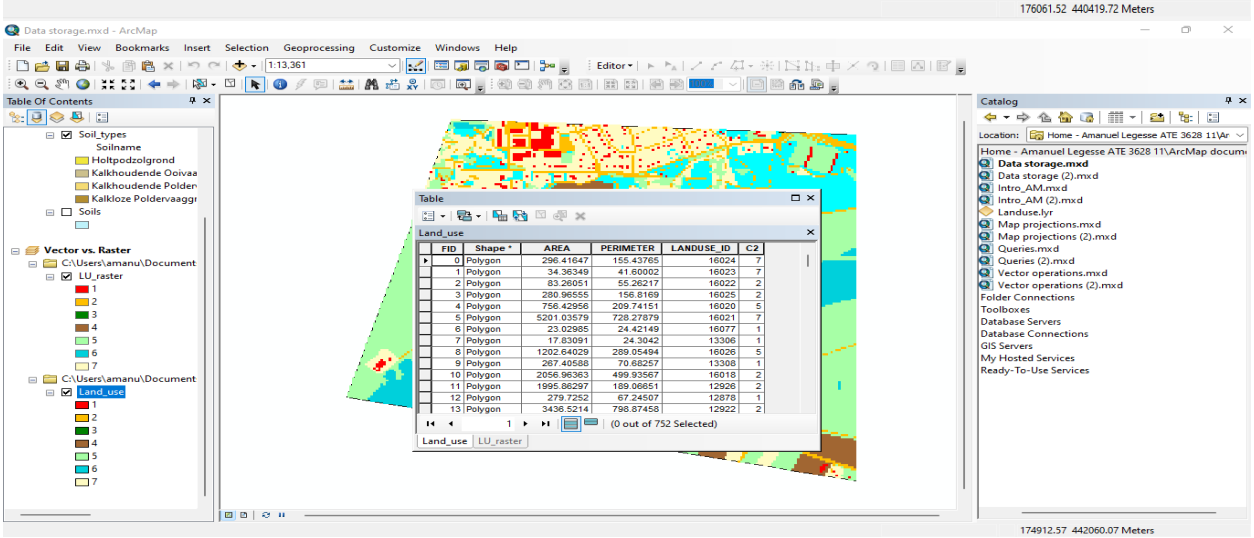


Zone vs. region in raster

7. Zones because it represent all geographic objects with the same value and in the attribute table the values represent the zones.

8. Land_Use is a type of attribute with fields specifying the area, perimeter and shape of the land mainly focusing on just the lands where Land_raster specifies the values and counts of that raster.





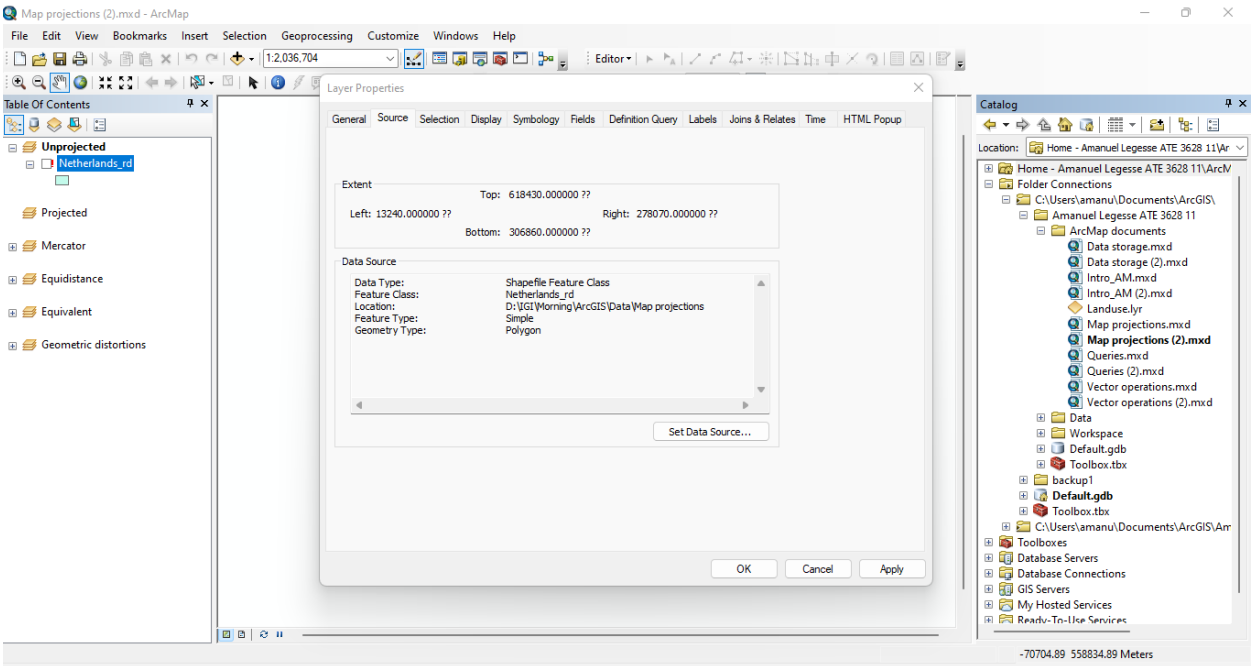
ARC-GIS

EXCERCISE: 3

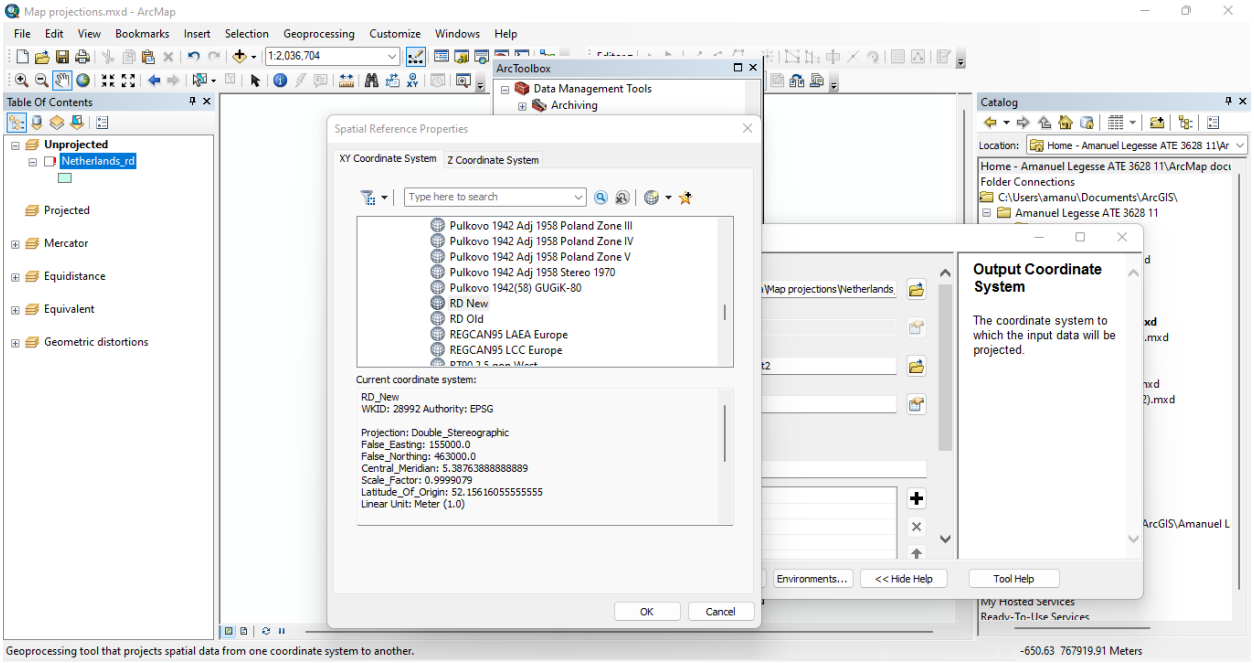
ArcGIS

PROJECTING SPATIAL DATASET

1.A:



1.B: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Pulkovo 1942 Adj 1958 Poland Zone IV
Pulkovo 1942 Adj 1958 Poland Zone V
Pulkovo 1942 Adj 1958 Stereo 1970
Pulkovo 1942(58) GUGiK-80
RD New
RD Old
REGCAN95 LAEA Europe
REGCAN95 LCC Europe
Current coordinate system:
RD_New
WKID: 28992 Authority: EPSG
Projection: Double_Stereographic
False_Easting: 155000.0
False_Northing: 463000.0
Central_Meridian: 5.38763888888889
Scale_Factor: 0.9999079
Latitude_Of_Origin: 52.15616055555555
Linear Unit: Meter (1.0)
OK
Cancel
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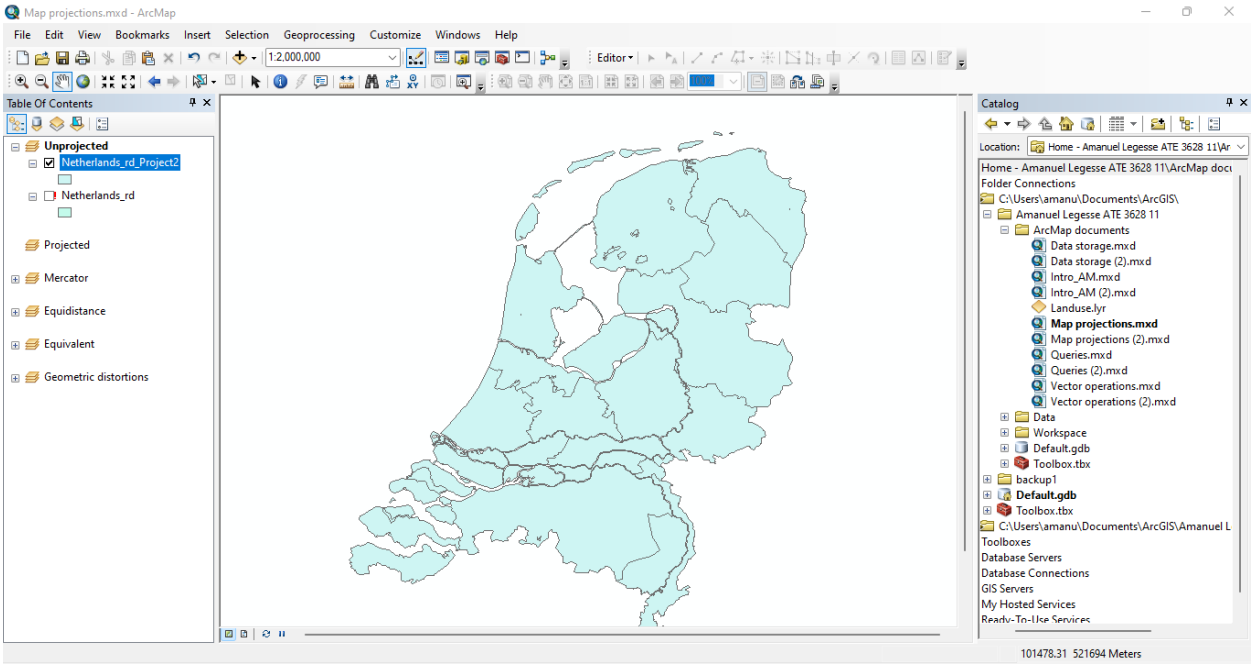
Output Coordinate System
The coordinate system to which the input data will be projected.
Environments...
<< Hide Help
Tool Help
Geoprocessing tool that projects spatial data from one coordinate system to another.
-650.63 767919.91 Meters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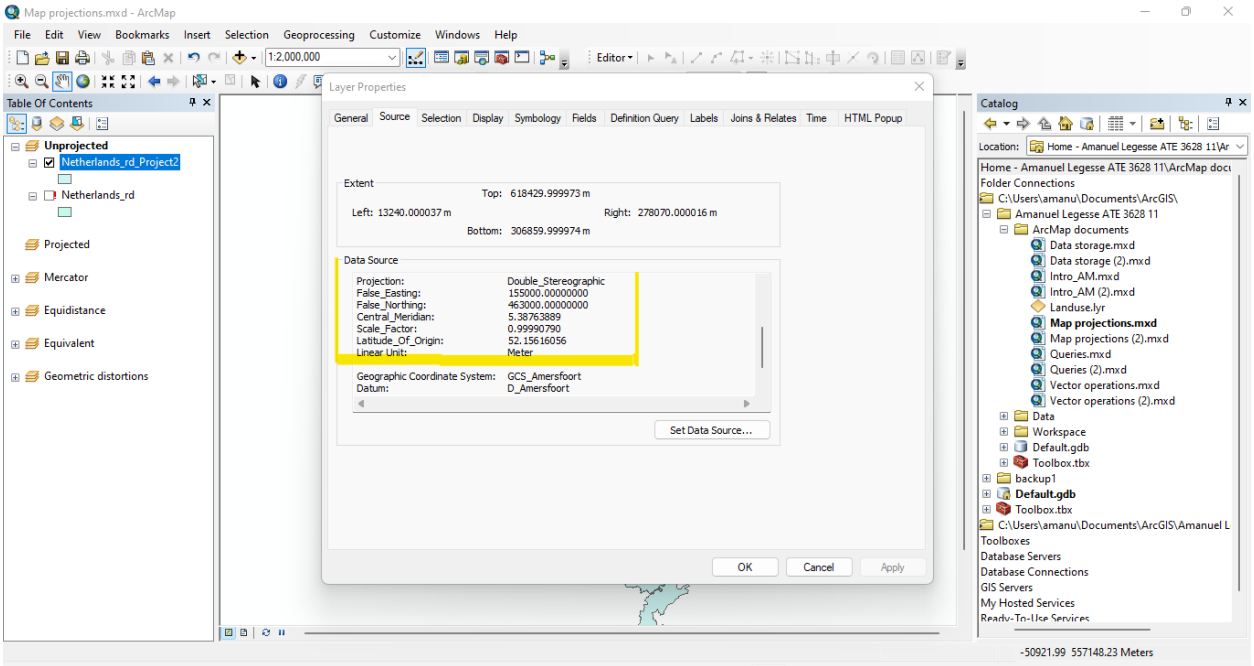
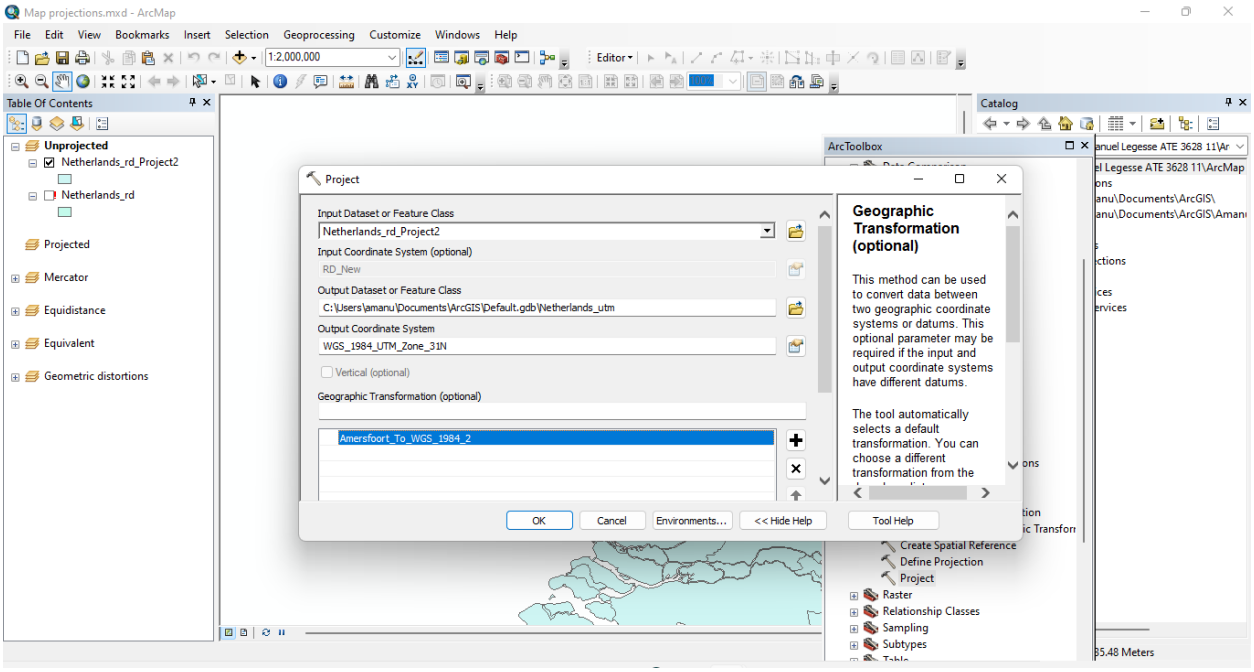
1.C: The projection is coordinate system based



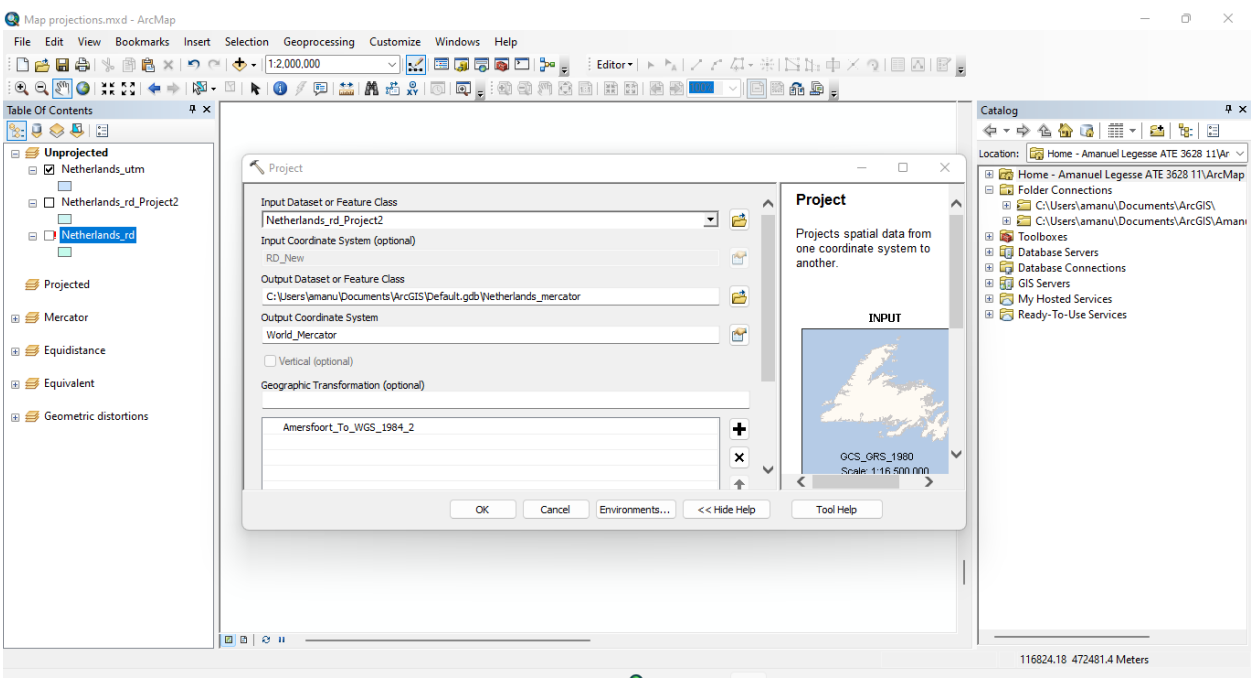
1.D: The Linear unit is in Meter.

Reprojecting spatial datasets

2.A:

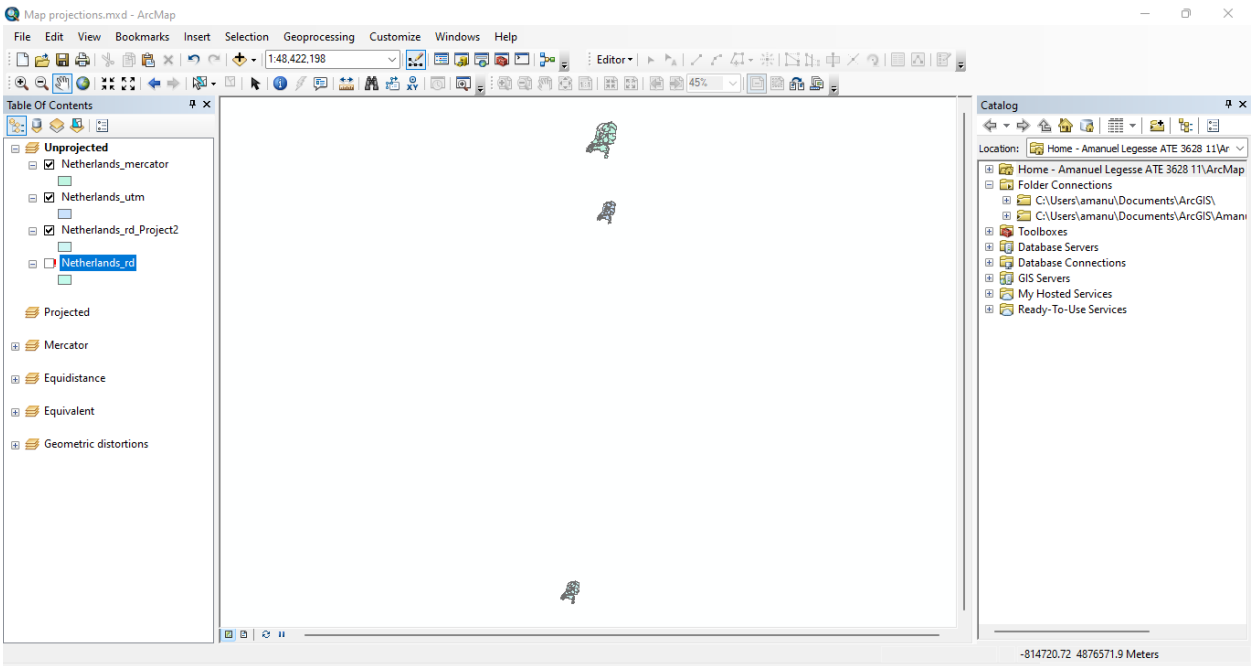


2.B:



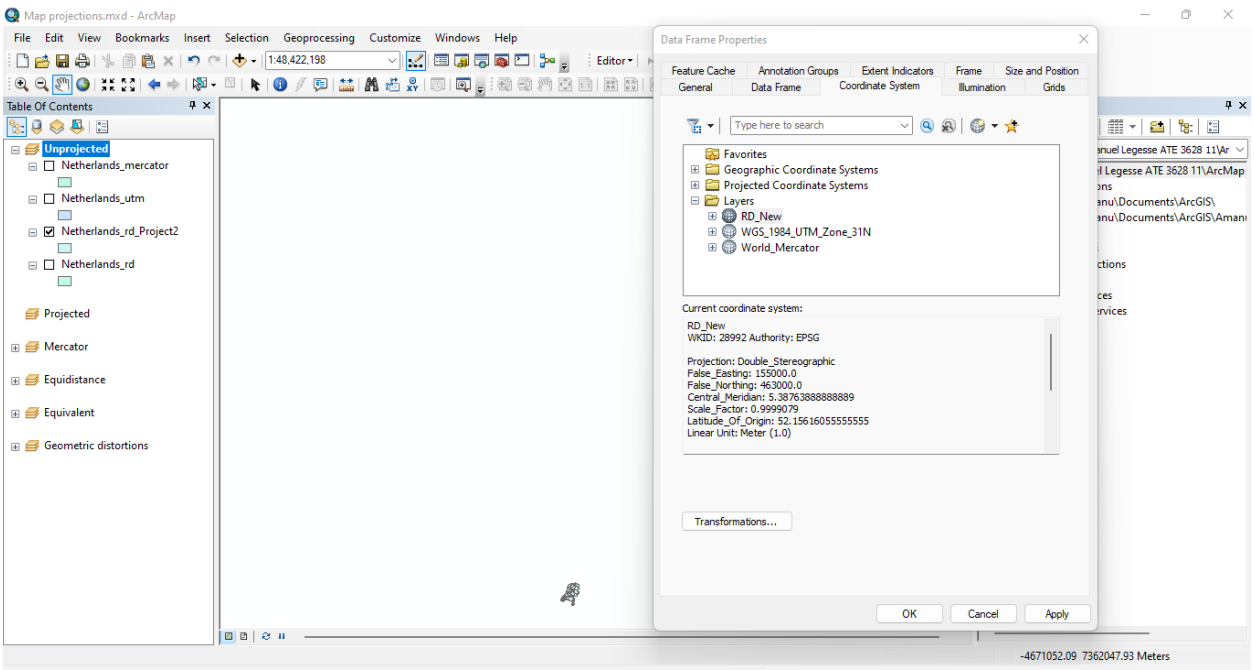
2.C: The three datasets don't overlap because of their map projection towards the coordinate system placing each dataset in different parts of the world

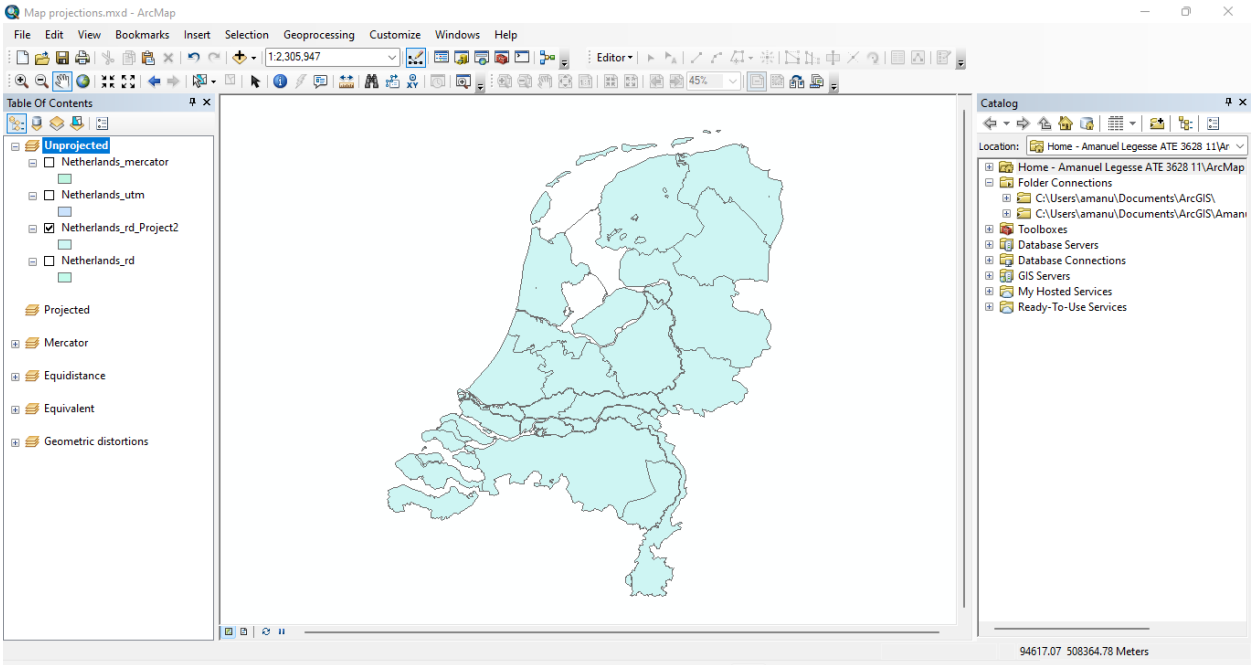
(Example map projection UTM was placed in the Northern Hemisphere).



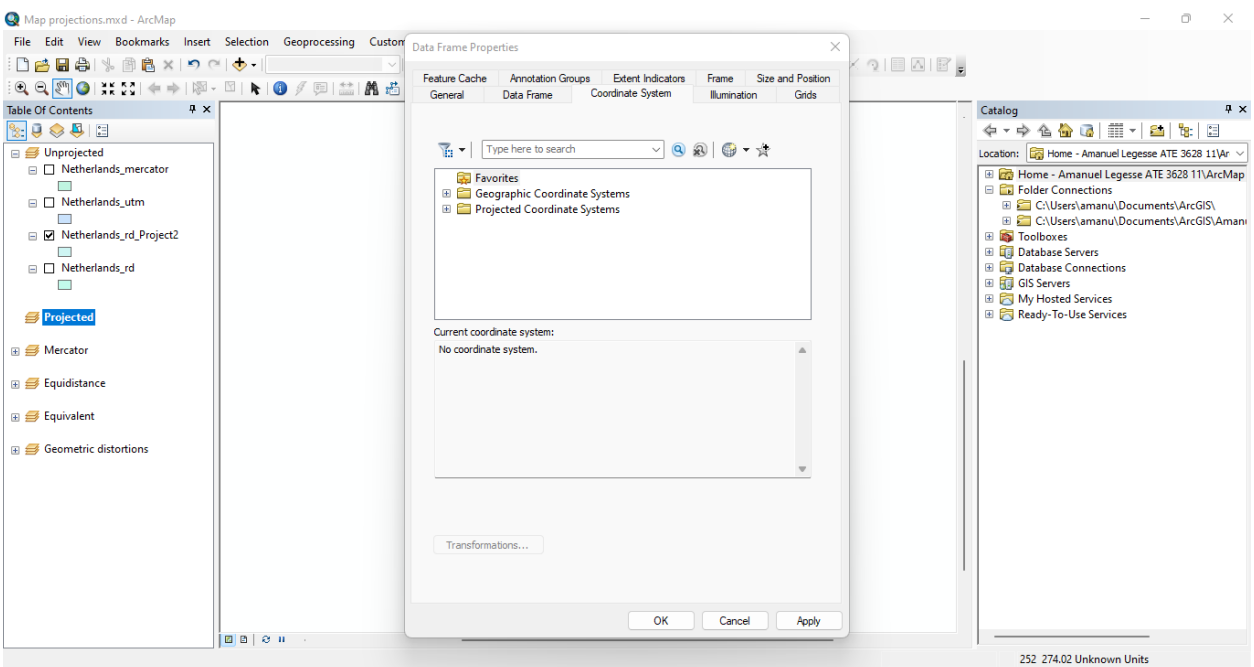
Projection of the Data Frame

3.A: As seen below after the projection of the Data Frame was changed to 'RD New' the map becomes in full view and clear.



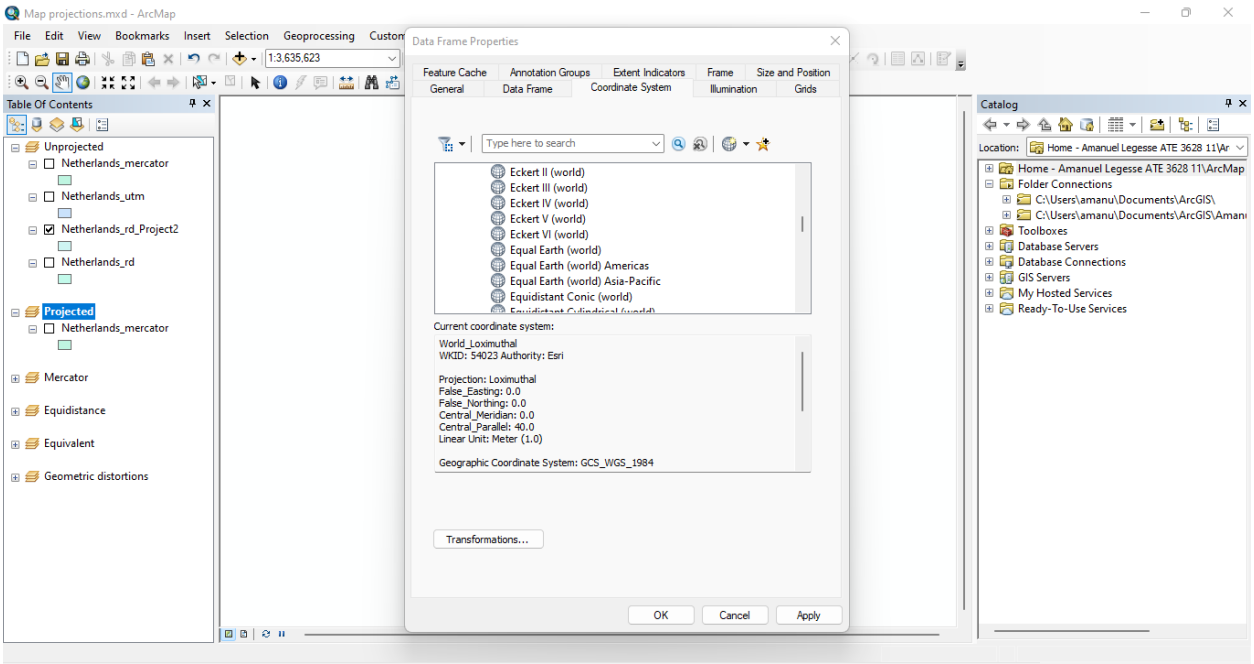


3.B: The is no coordinate system.

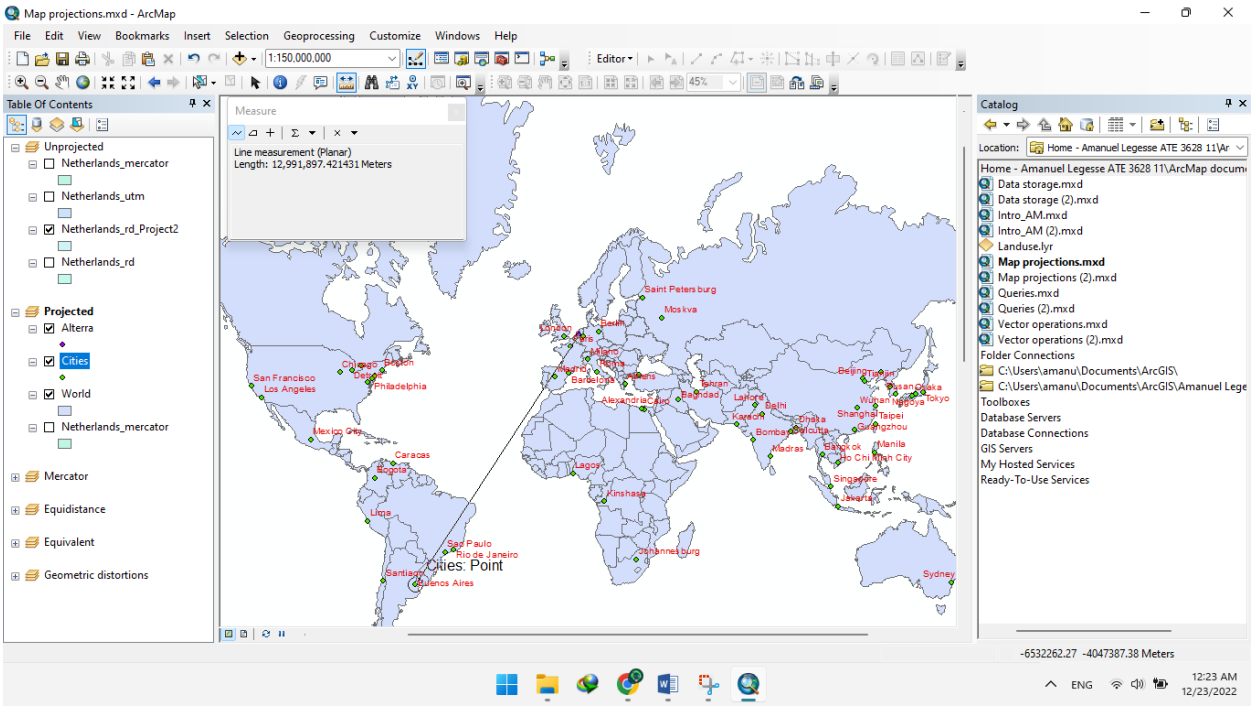


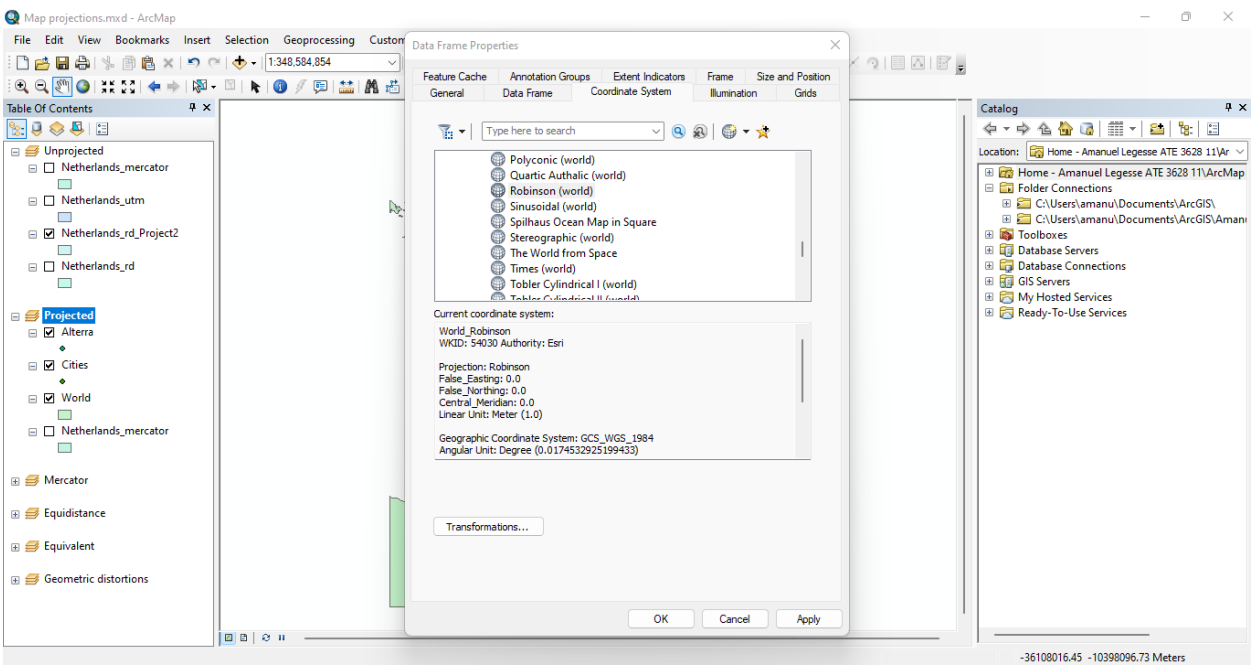
3.C:

- Projected Coordinate System: World_Mercator
- Projection: Mercator
- Geographic Coordinate System: GCS_WGS_1984

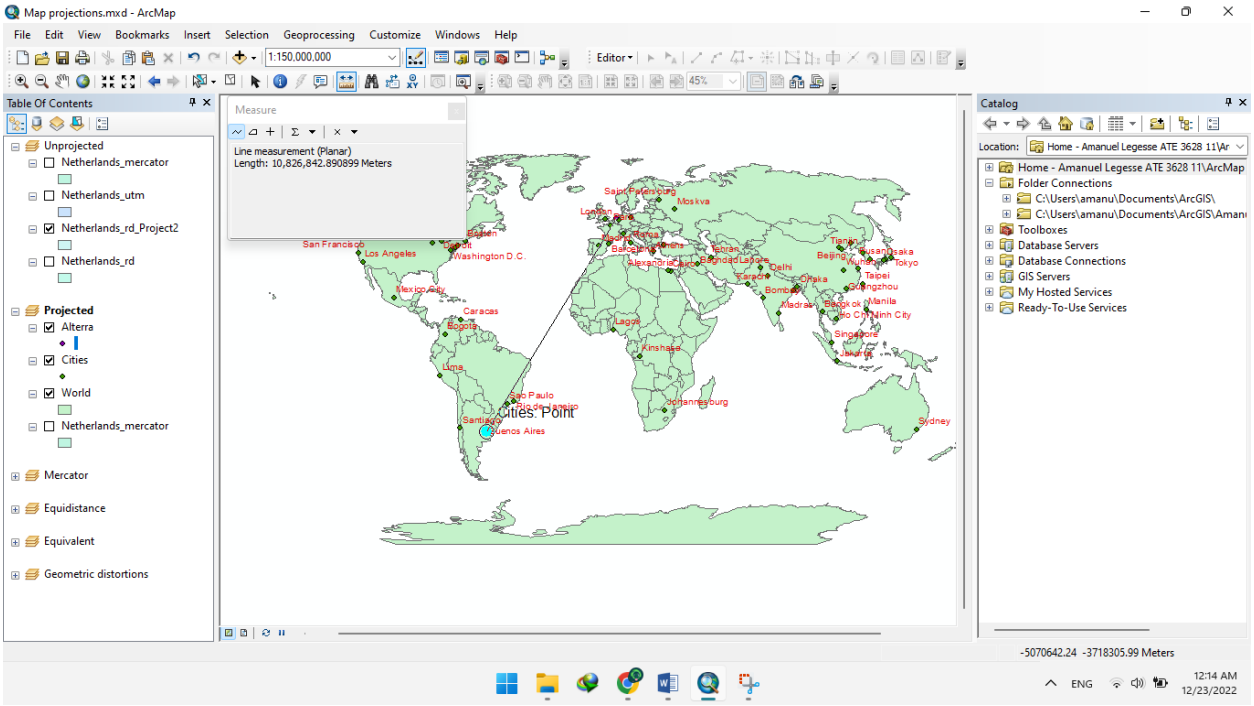


3.D:





- Yes the distance differ from the previous measurement because the projected coordinate system was changed to Robinson.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Geometric distortions

4.A: Mercator

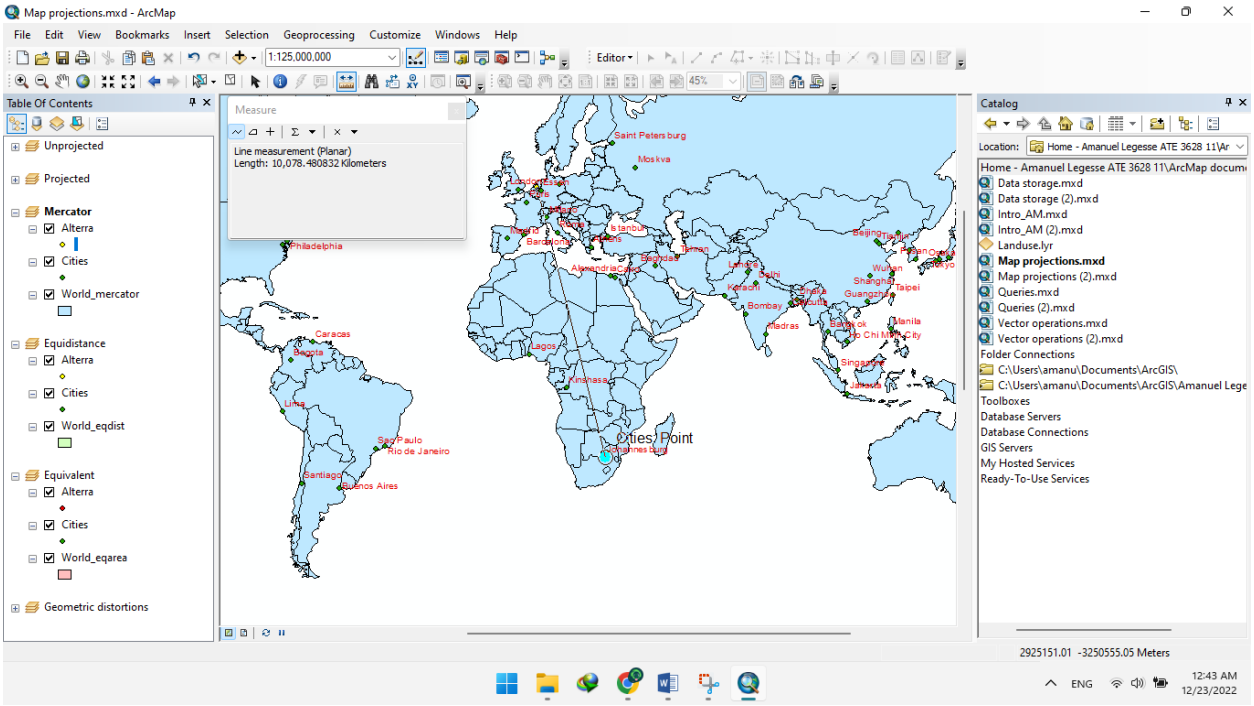


Figure: Alterra – Johannesburg (km)

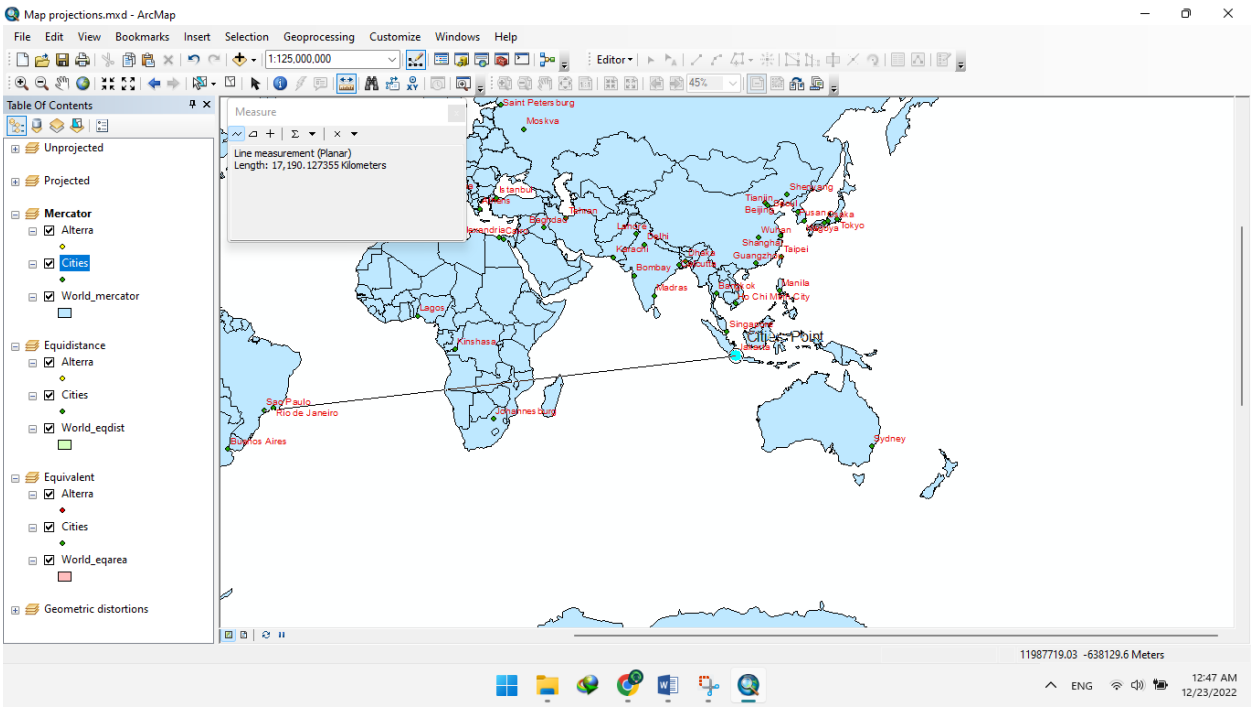


Figure: São Paulo – Jakarta (km)

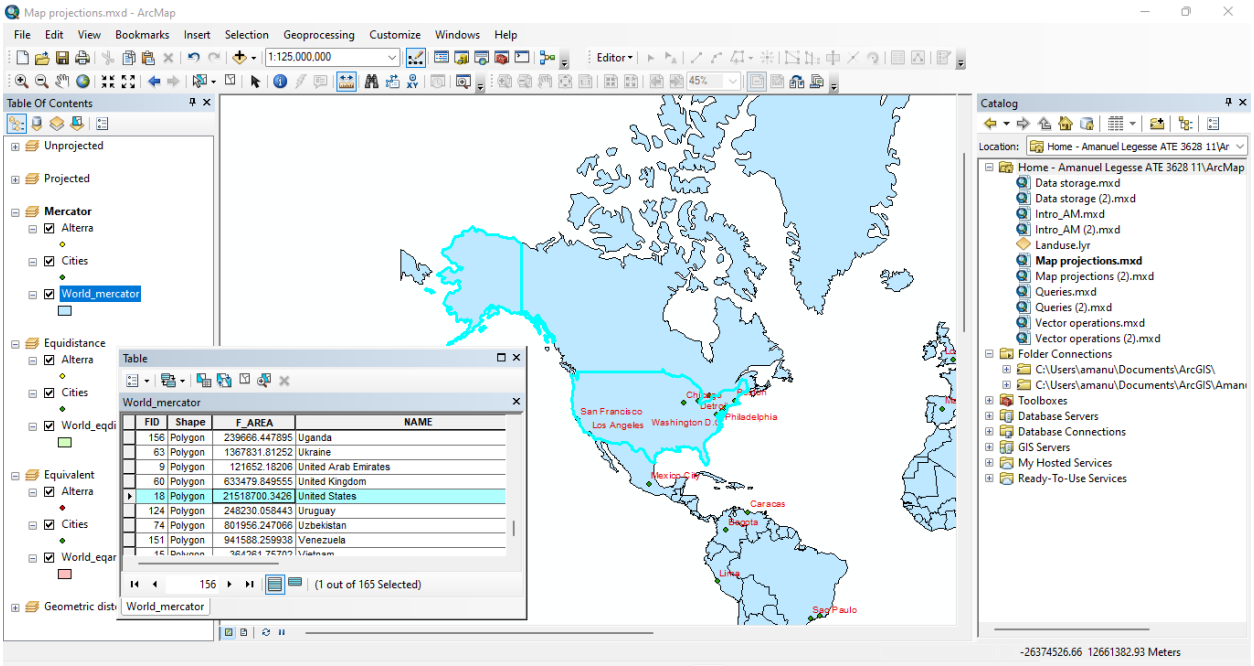


Figure: Area USA (km²)

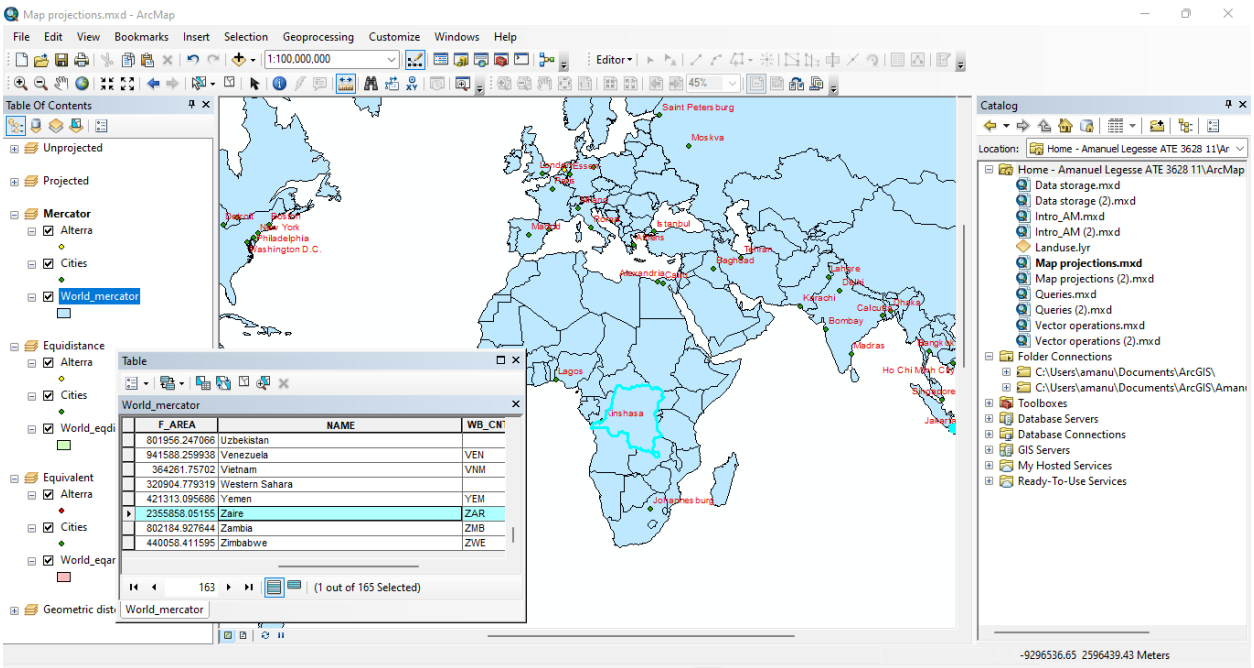


Figure: Area Dem. Rep. Congo (km²)

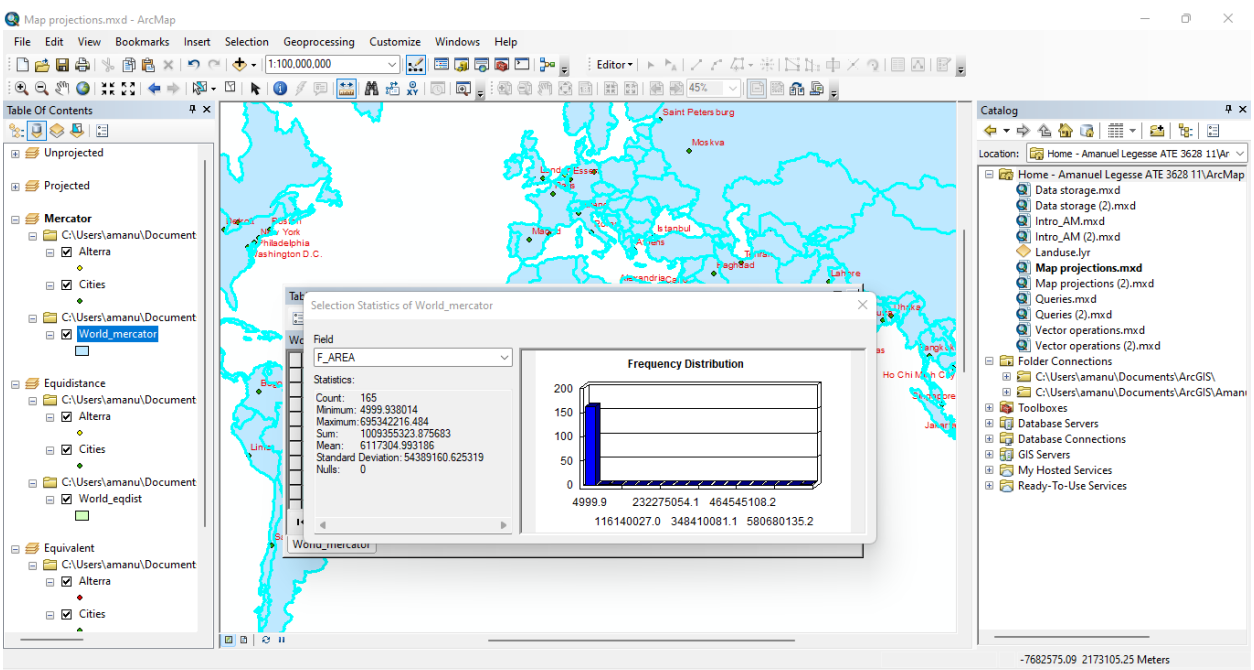


Figure: Area World (km²)

4.B: Equidistant

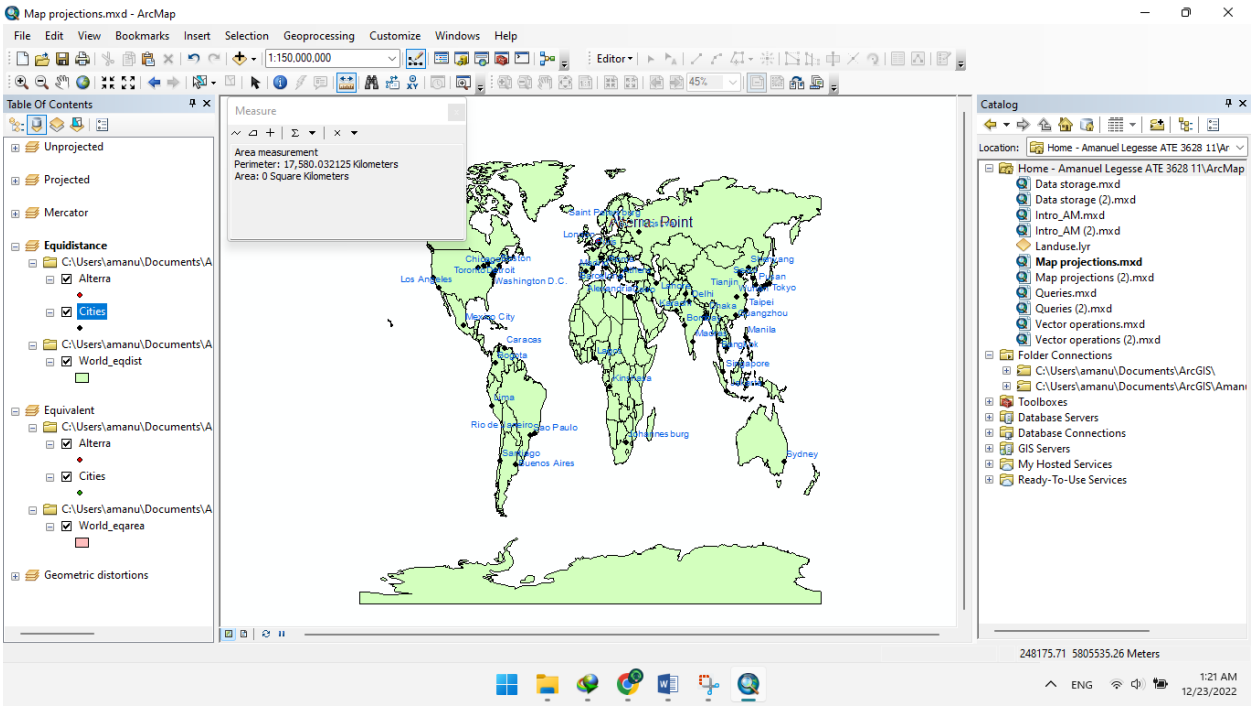


Figure: Alterra – Johannesburg (km)

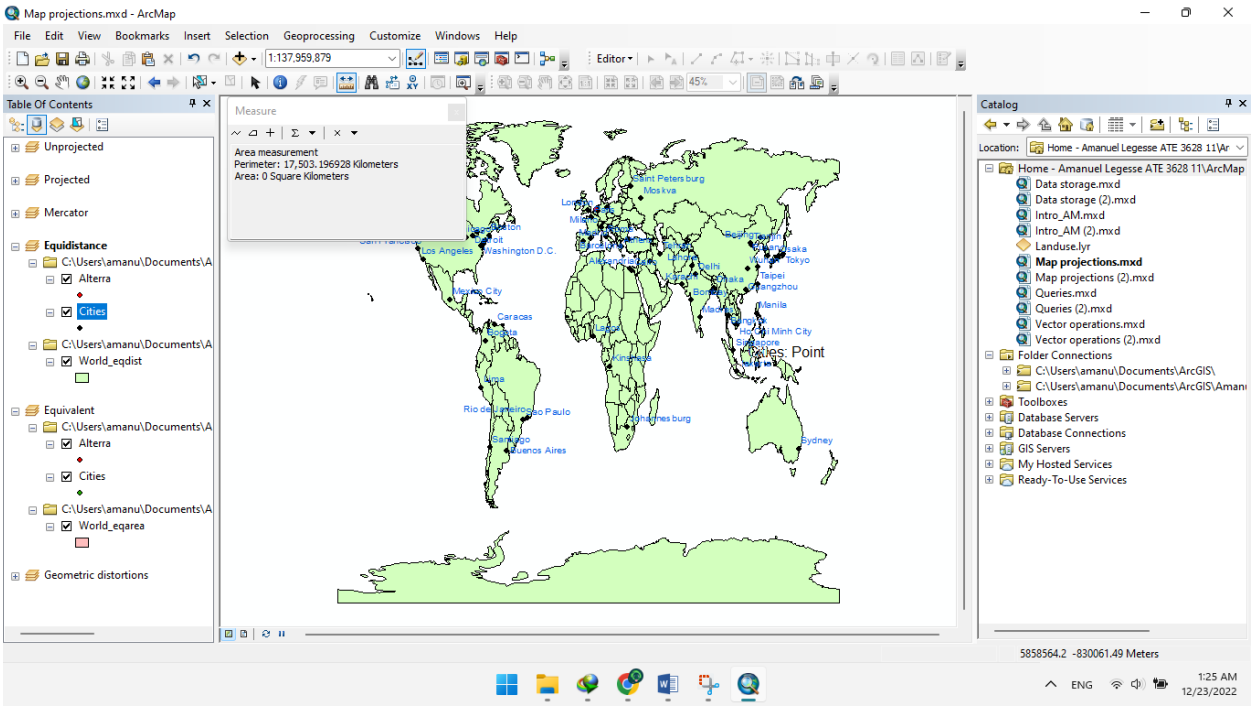


Figure: São Paulo – Jakarta (km)

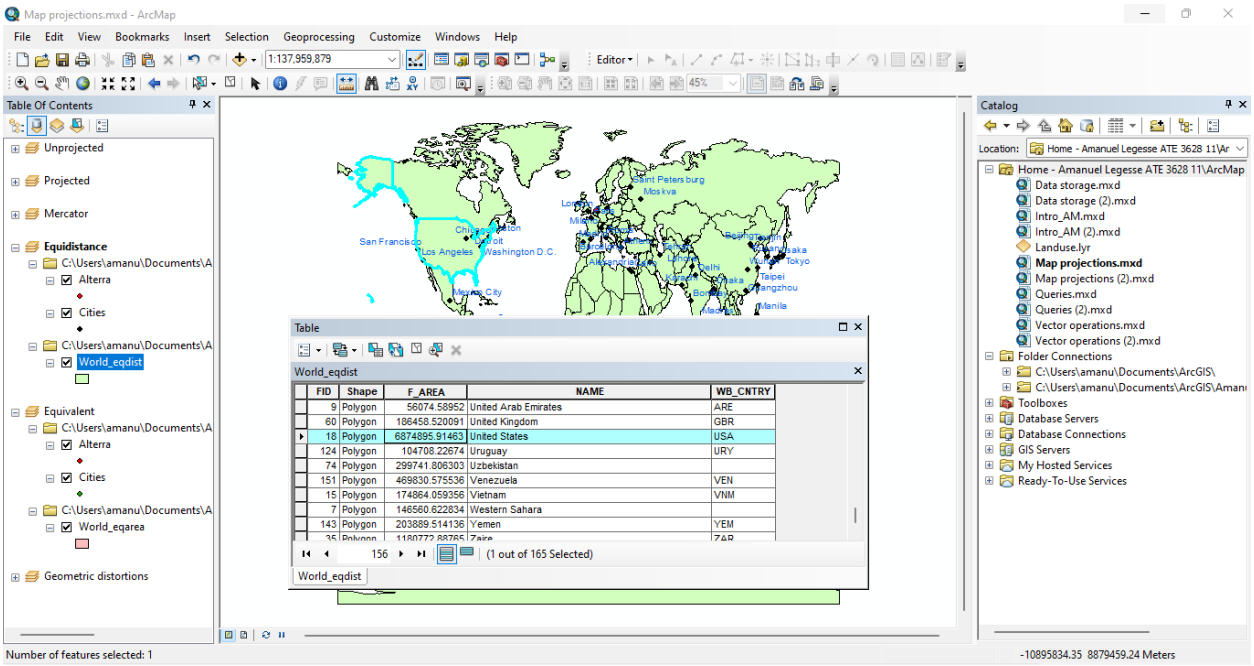


Figure: Area USA (km²)

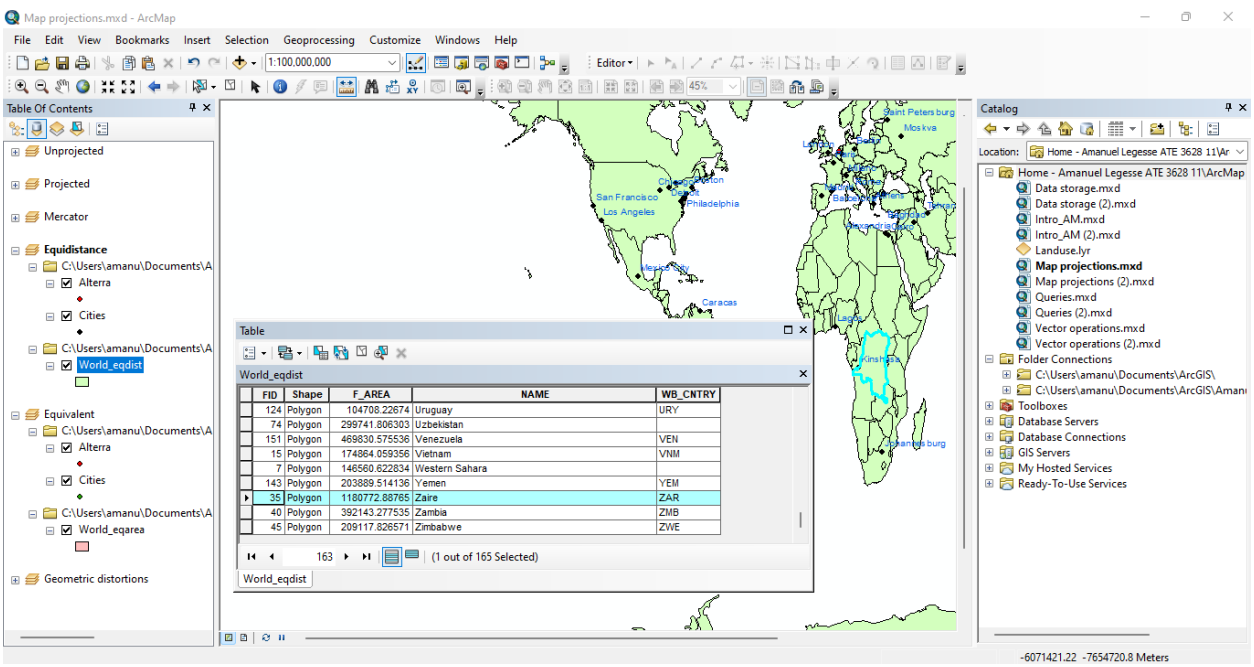


Figure: Area Dem. Rep. Congo (km²)

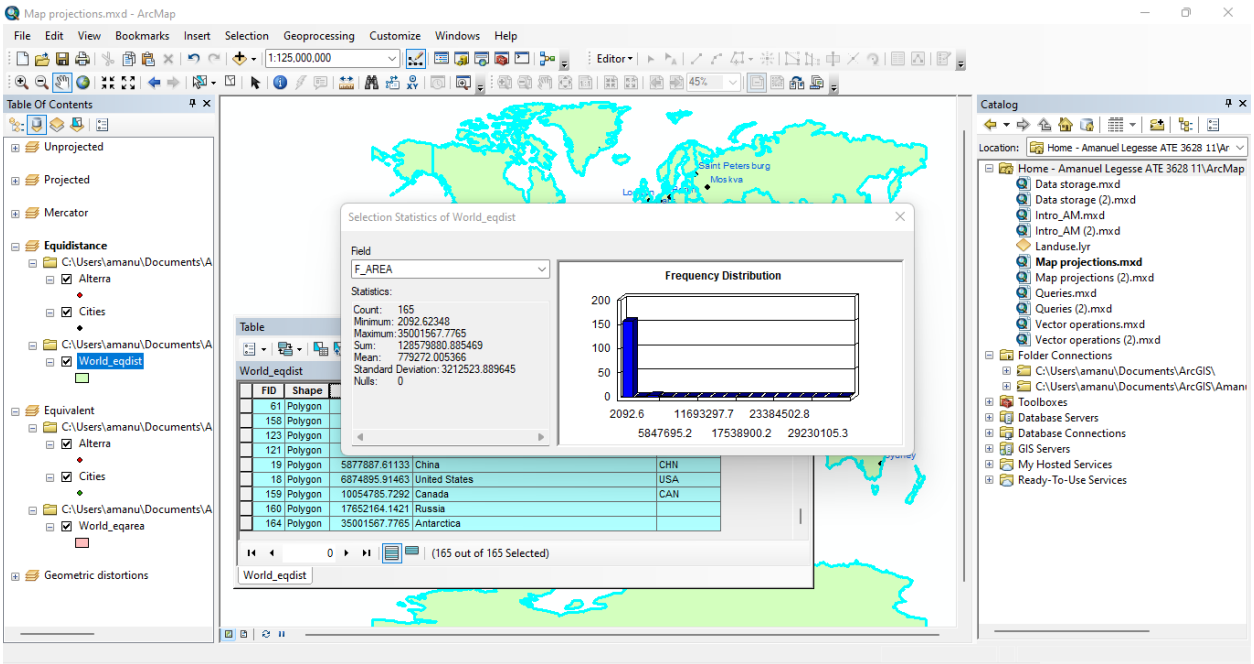


Figure: Area World (km²)

4.C: Equivalent

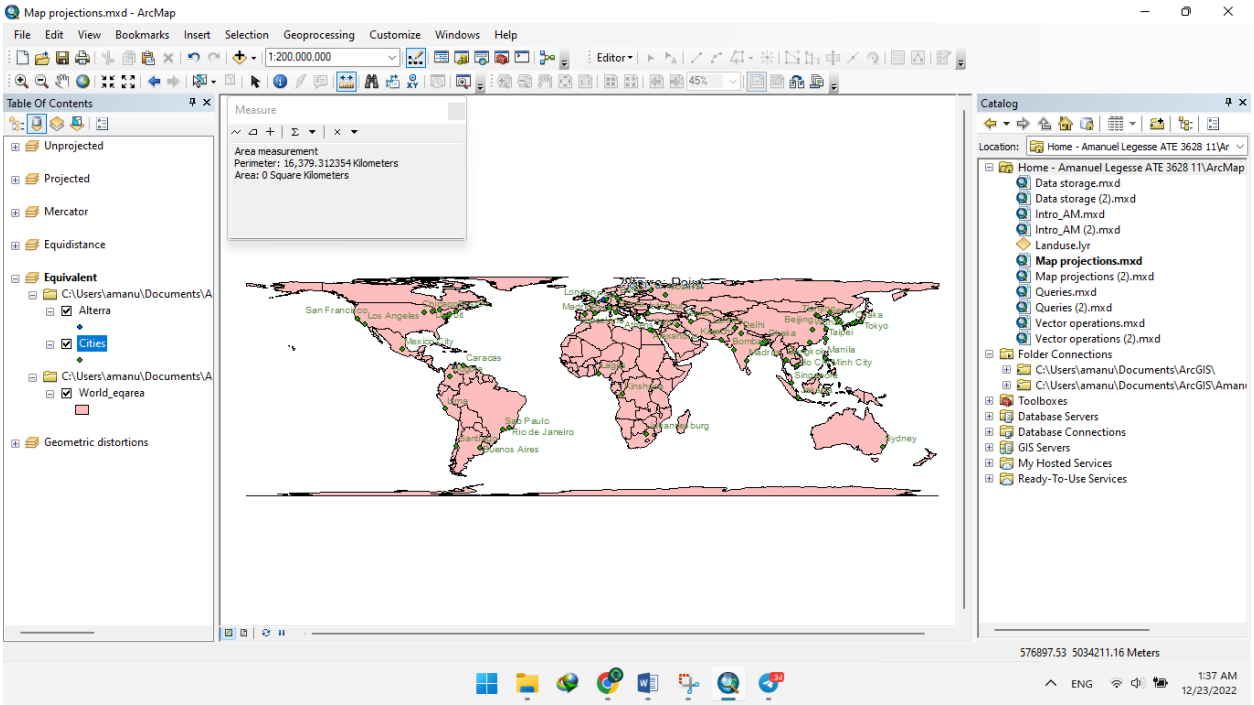


Figure: Alterra – Johannesburg (km)

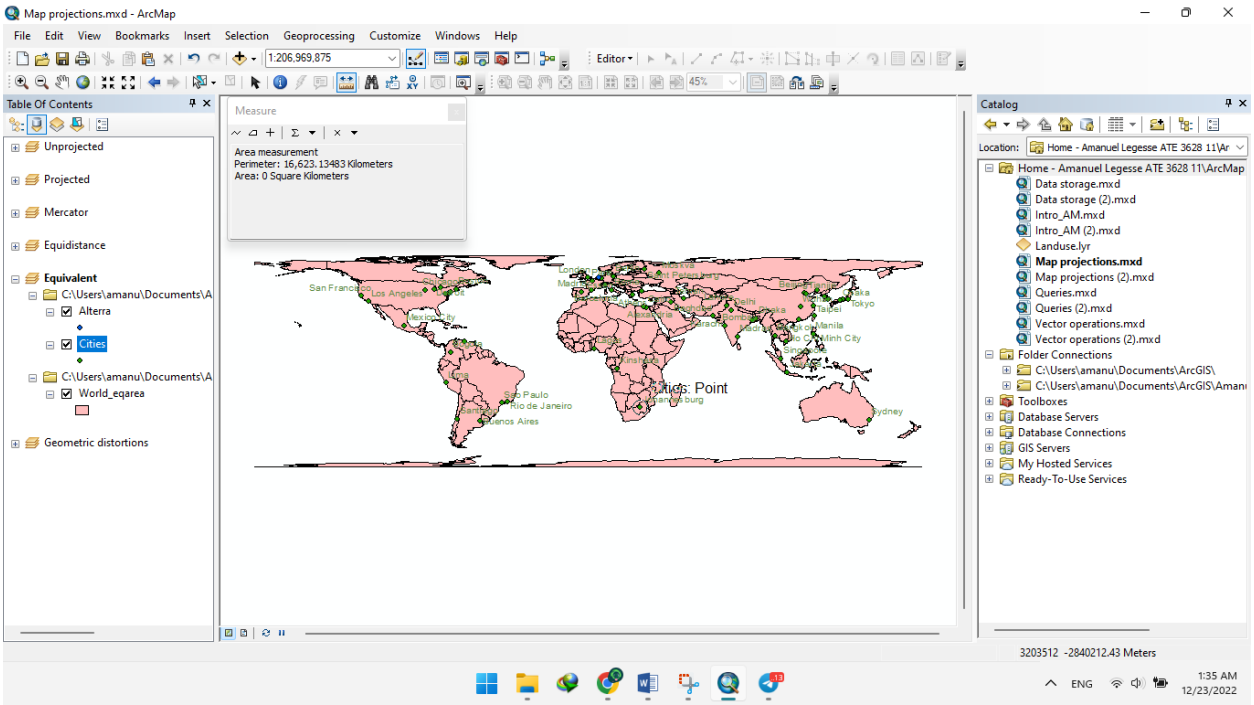


Figure: São Paulo – Jakarta (km)

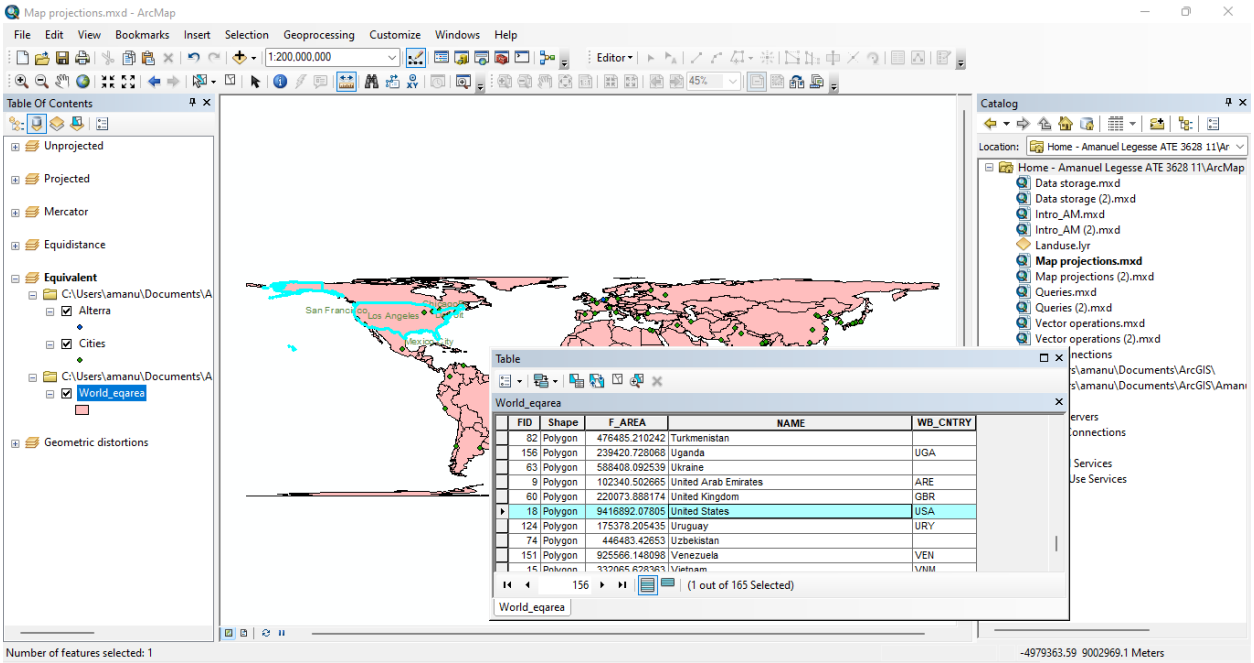


Figure: Area USA (km²)

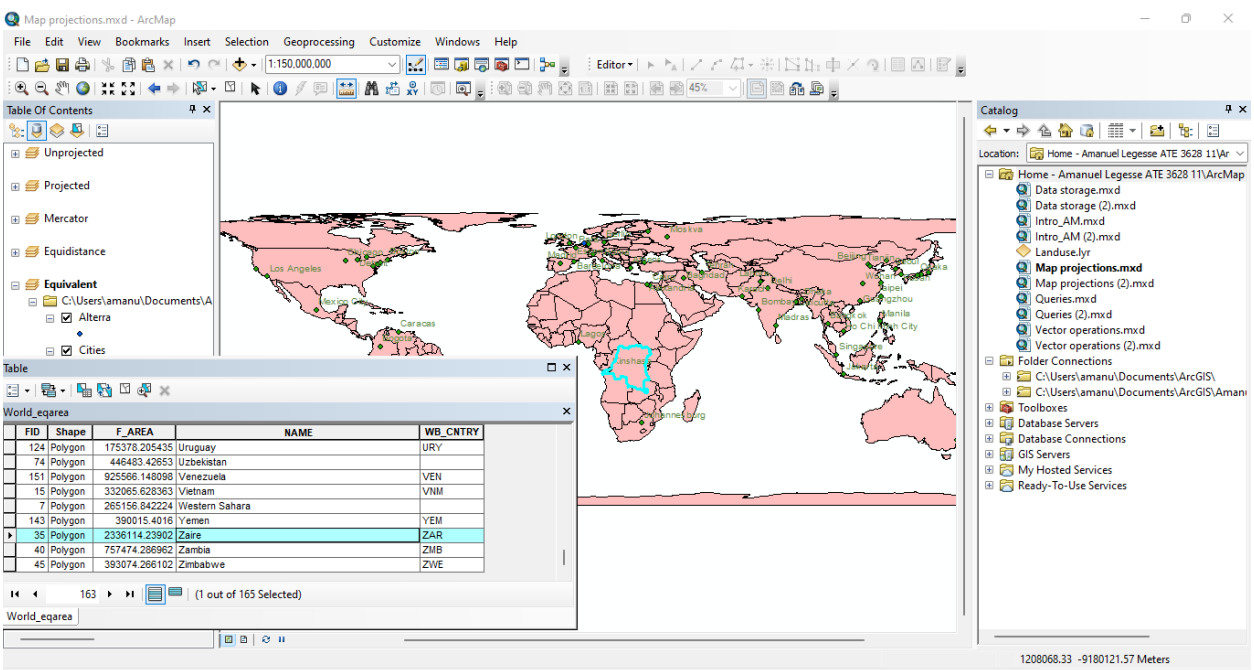


Figure: Area Dem. Rep. Congo (km²)

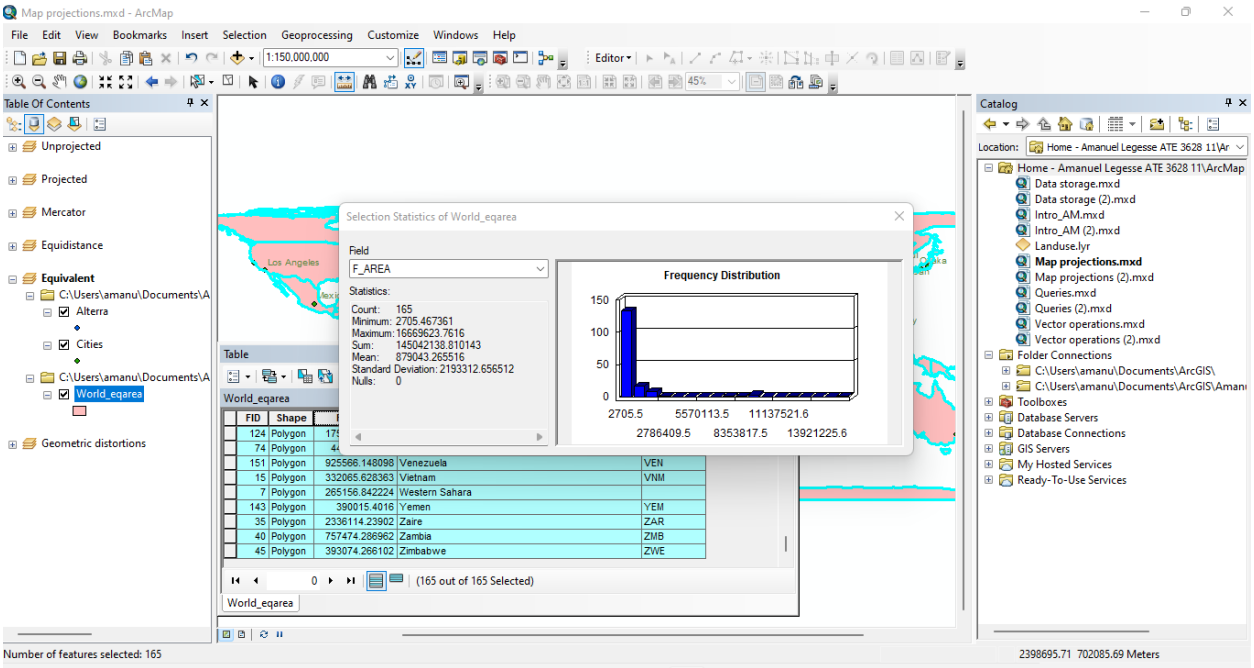


Figure: Area World (km²)

	Mercator	Equidistant	Equivalent	Equivalent True dist./ area
Alterra – Johannesburg (km)	10,078.480832	17,508.032125	16,379.312354	8,979
São Paulo – Jakarta (km)	17,190.127355	17,503.196928	16,623.13483	15,646
Area USA (km^2)	21518700.3426	6874895.91463	9416892.07805	9,631,418
Area Dem. Rep. Congo (km^2)	2355858.05155	1180772.88765	2336114.23902	2,345,410
Area World (km^2)	1009355323.875683	128579880.885469	145042138.810143	148,939,100

Table: Distance and area comparison using different projections

ARC-GIS

EXCERCISE: 4

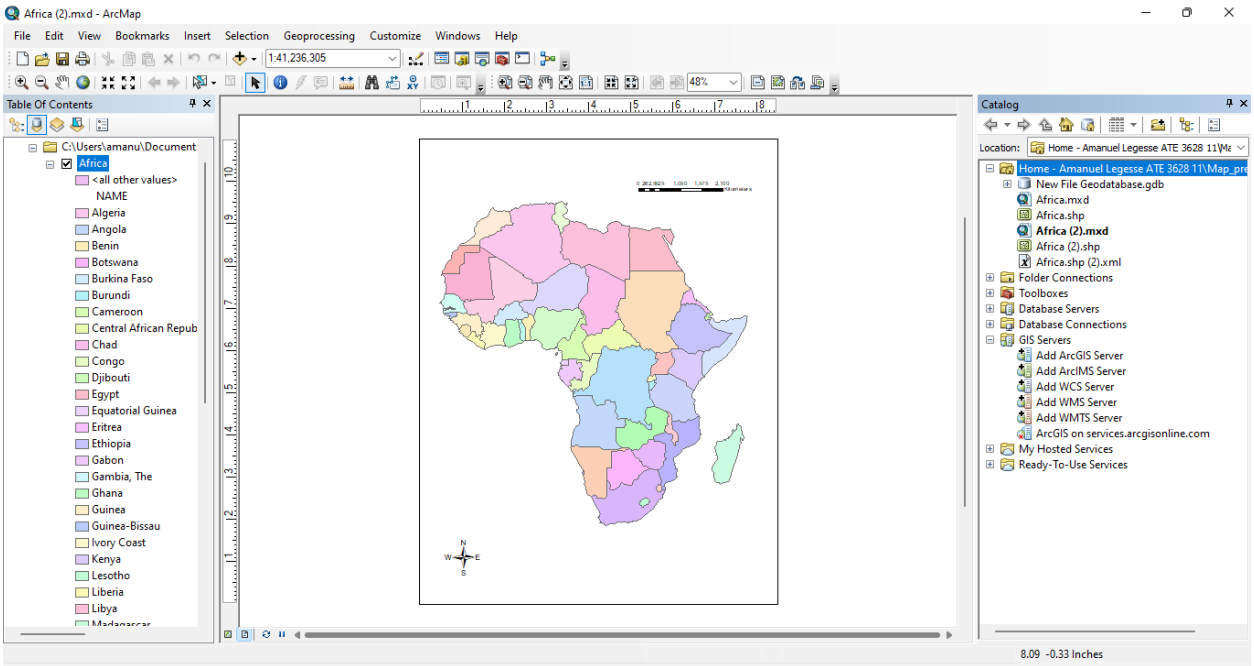
ArcGIS

VISUALIZING DATA IN ARCGIS

Creating a map Layout using ArcMap

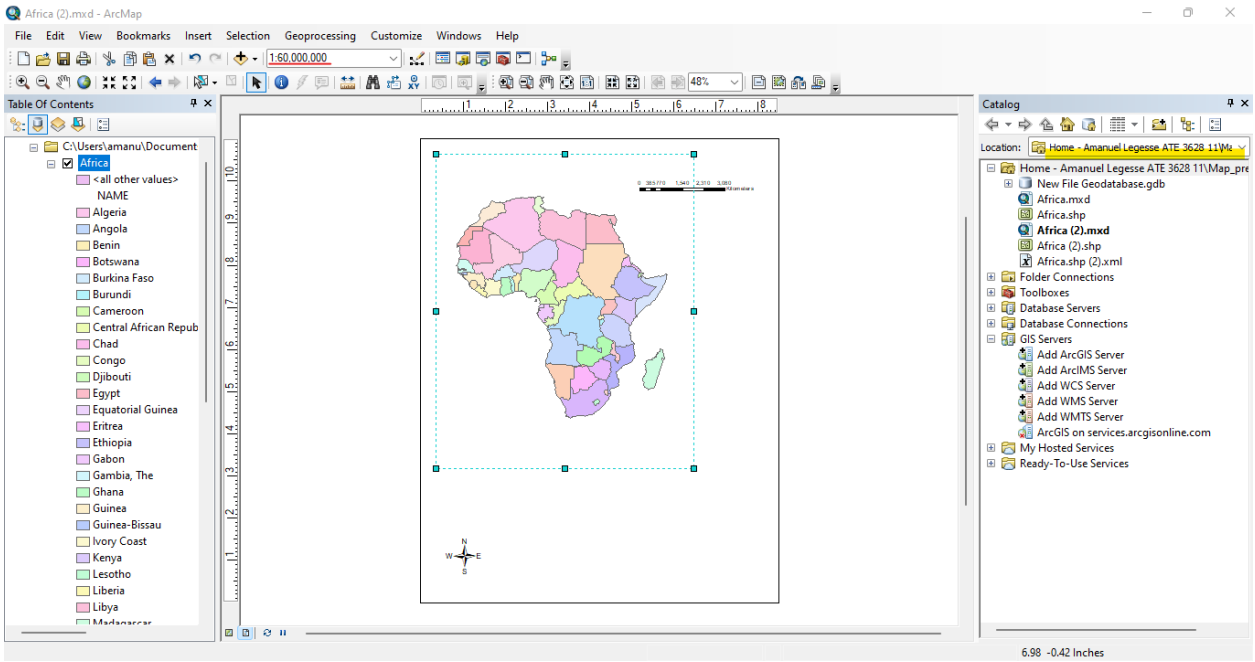
- Step 1 Start ArcMap and open a map document:

✓ Had to navigate to the folder and select Africa.shp to preview the map.



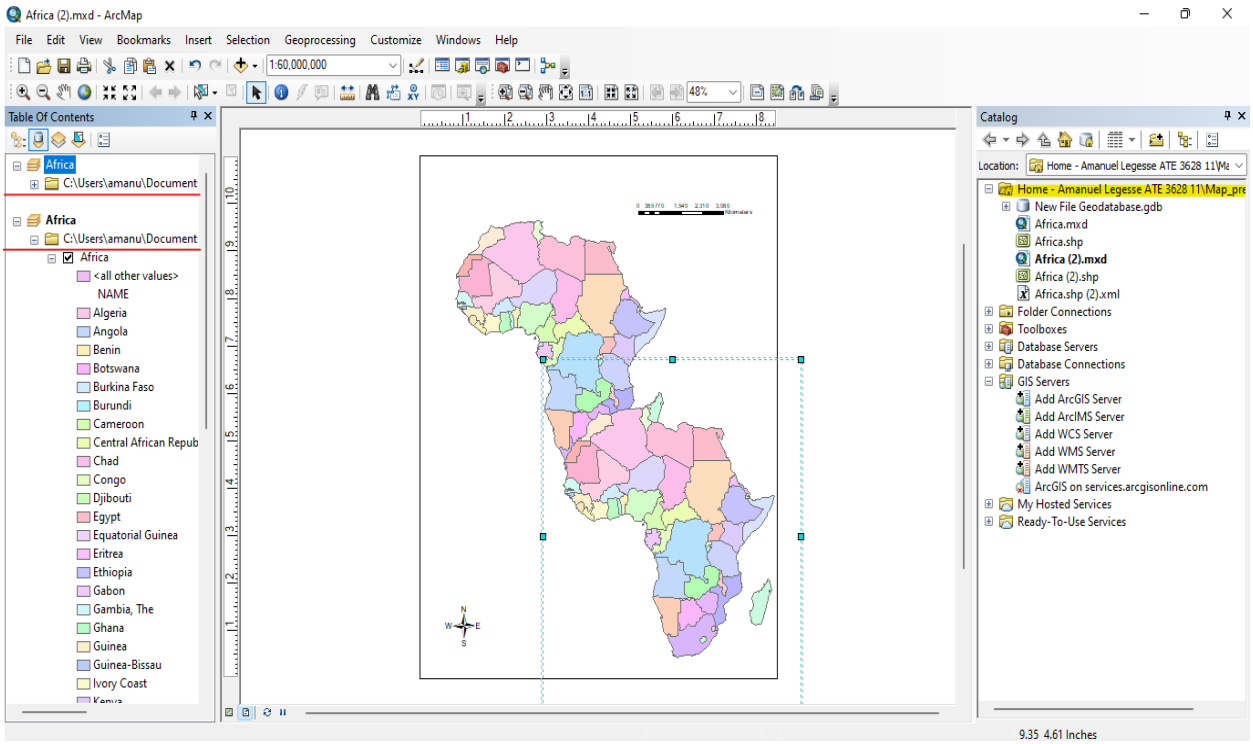
- Step 2 Change the size of the data frame in the layout

- The scale of the data frame was changed to 1:60,000,000.

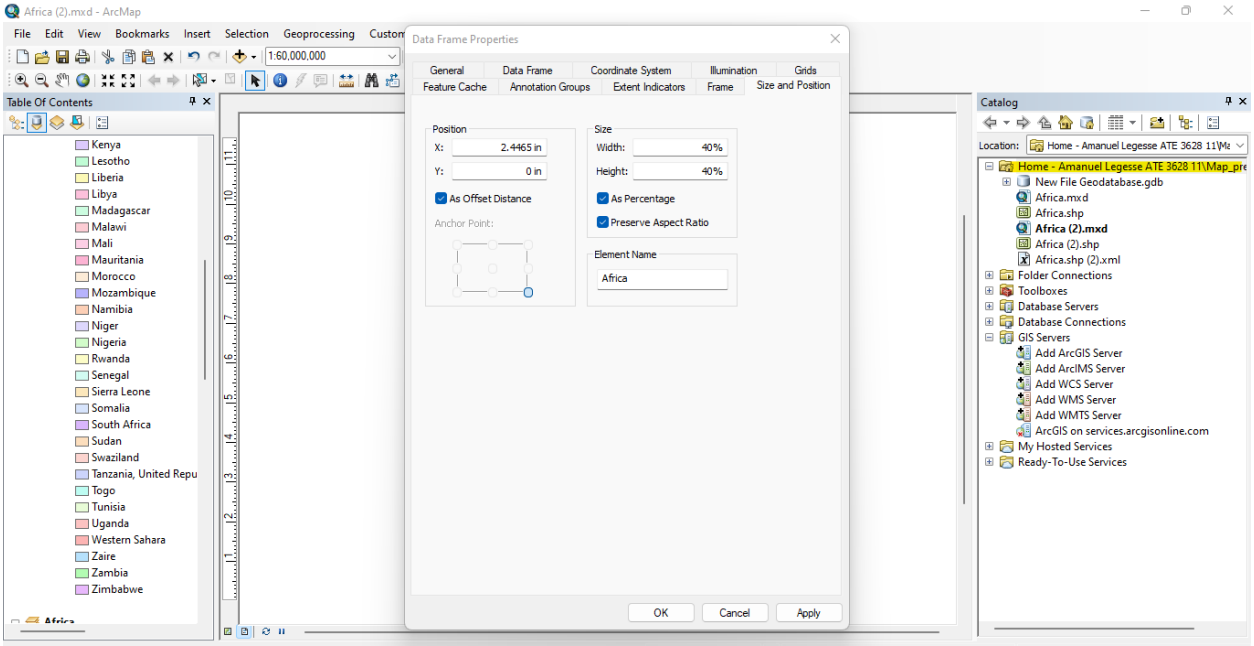


- Step 3 Create a map inset

✓ When creating a copy of the data frame its seen that a new data frame is added to the table of contents



✓ The value of the width and height was changed to 40%


Africa (2).mxd - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Custom
1:60,000,000
Table Of Contents
Kenya
Lesotho
Liberia
Libya
Madagascar
Malawi
Mali
Mauritania
Morocco
Mozambique
Namibia
Niger
Nigeria
Rwanda
Senegal
Sierra Leone
Somalia
South Africa
Sudan
Swaziland
Tanzania, United Repu
Togo
Tunisia
Uganda
Western Sahara
Zaire
Zambia
Zimbabwe
Data Frame Properties
General
Data Frame
Coordinate System
Illumination
Grids
Feature Cache
Annotation Groups
Extent Indicators
Frame
Size and Position
Position
X: 2.4465 in
Y: 0 in
As Offset Distance
Anchor Point:
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Height: 40%
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Preserve Aspect Ratio
Element Name
Africa
OK
Cancel
Apply
Catalog
Location: Home - Amanuel Legesse ATE 3628 11\Ma
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New File Geodatabase.gdb
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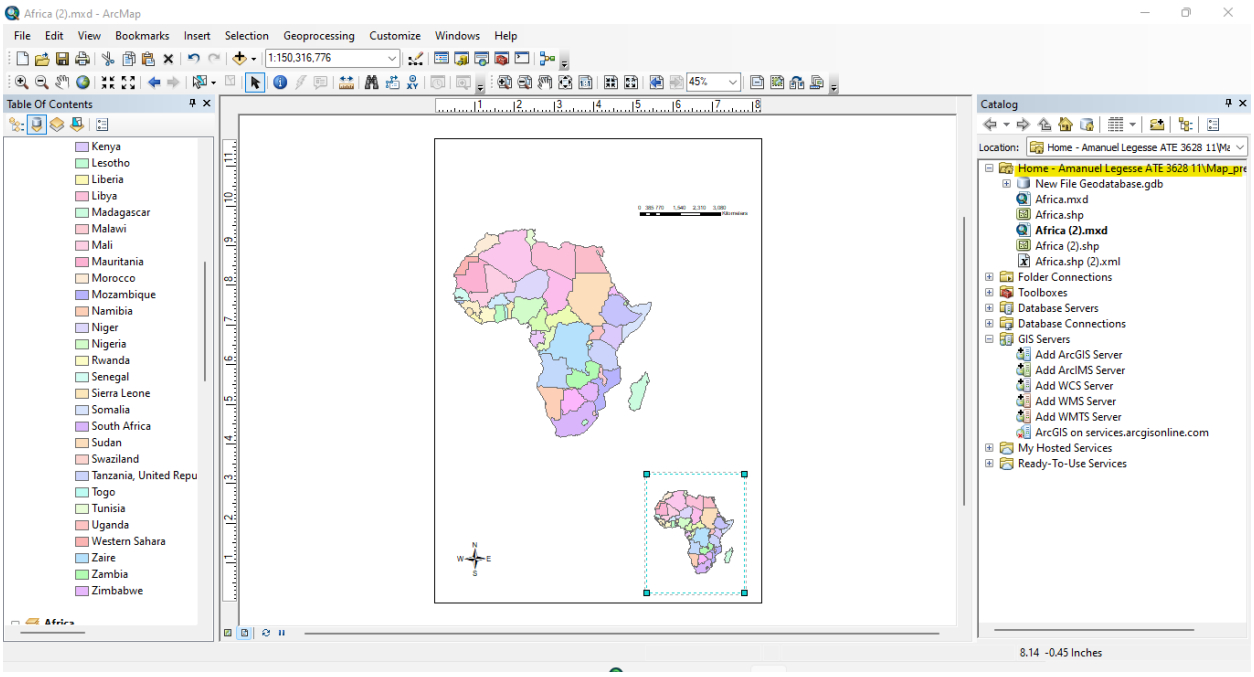
Africa.shp
Africa (2).mxd
Africa (2).shp
Africa.shp (2).xml
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
Add ArcGIS Server
Add ArcIMS Server
Add WCS Server
Add WMS Server
Add WMTS Server
ArcGIS on services.arcgisonline.com
My Hosted Services
Ready-To-Use Services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Kenya
Lesotho
Liberia
Libya
Madagascar
Malawi
Mali
Mauritania
Morocco
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Namibia
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Nigeria
Rwanda
Senegal
Sierra Leone
Somalia
South Africa
Sudan
Swaziland
Tanzania, United Repu
Togo
Tunisia
Uganda
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Africa (2).mxd
Africa (2).shp
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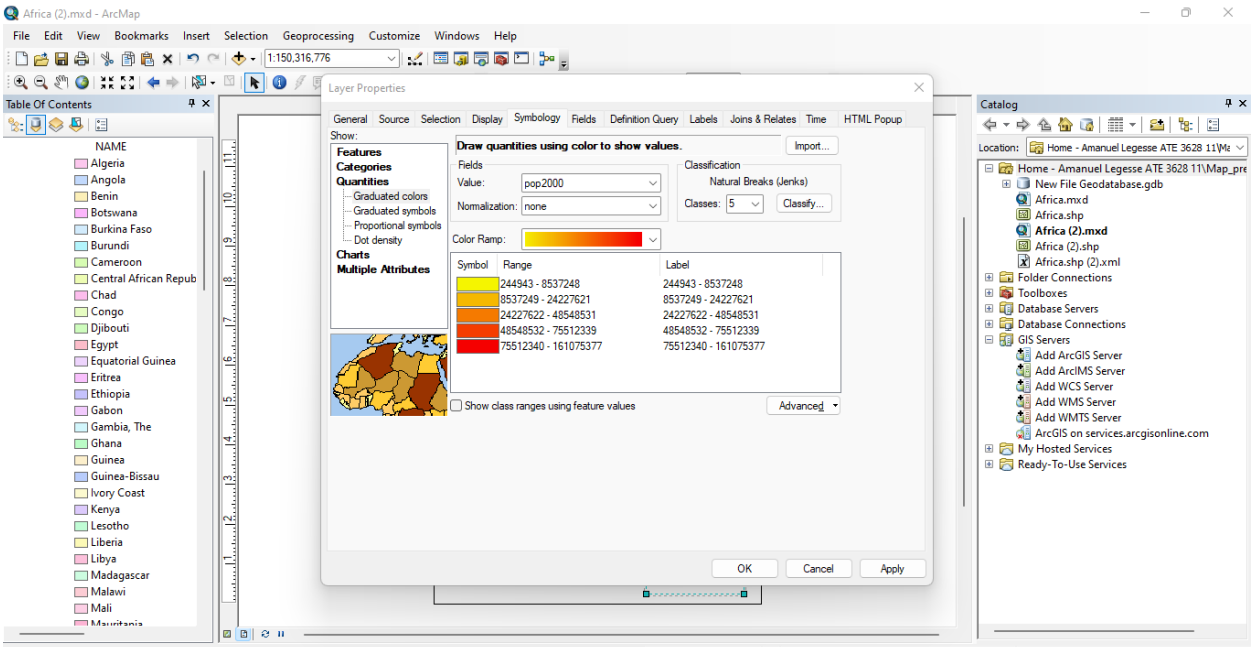
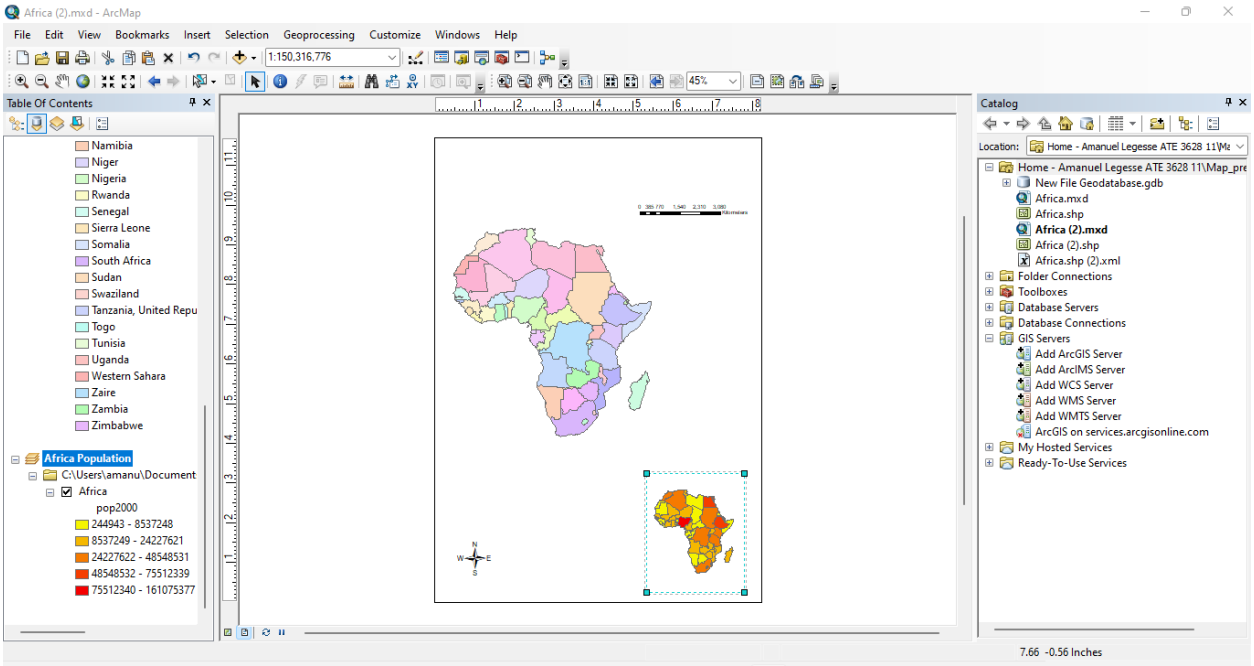
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
Add ArcGIS Server
Add ArcIMS Server
Add WCS Server
Add WMS Server
Add WMTS Server
ArcGIS on services.arcgisonline.com
My Hosted Services
Ready-To-Use Services
8.14 -0.45 Inches

- ✓ Step 4 Symbolize the map inset

- ✓ Quantities of the Graduated colors Fields area POP2000 was chosen and the Color was changed to yellow to red shade ramp.

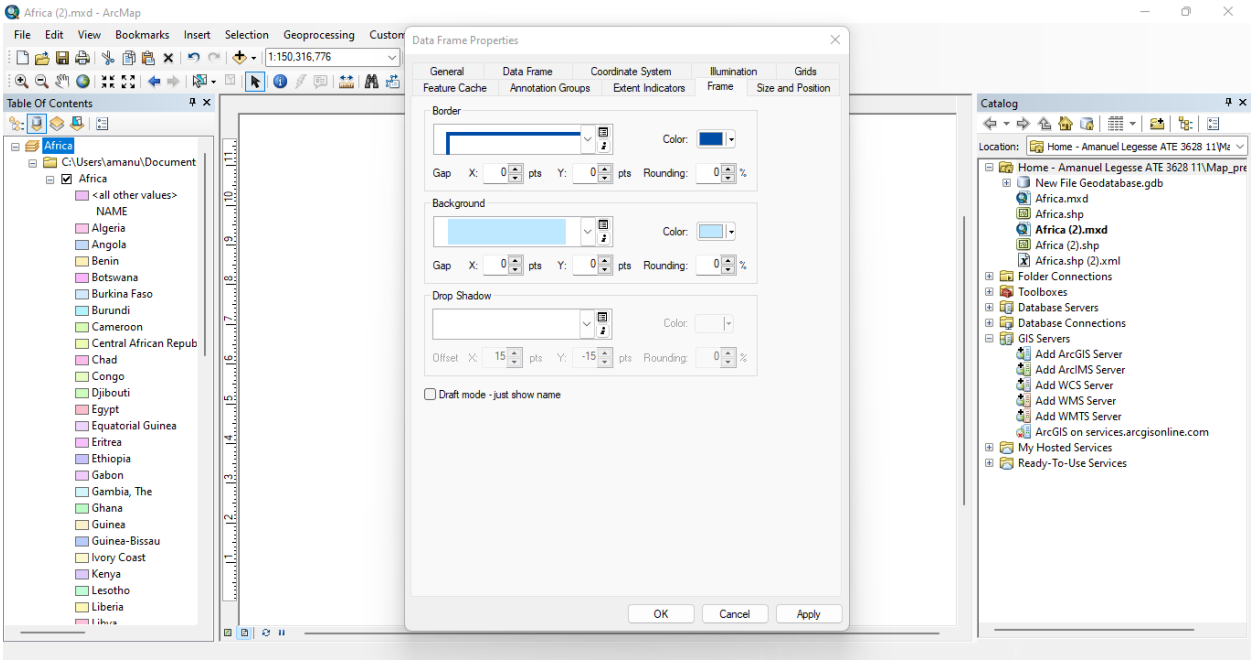


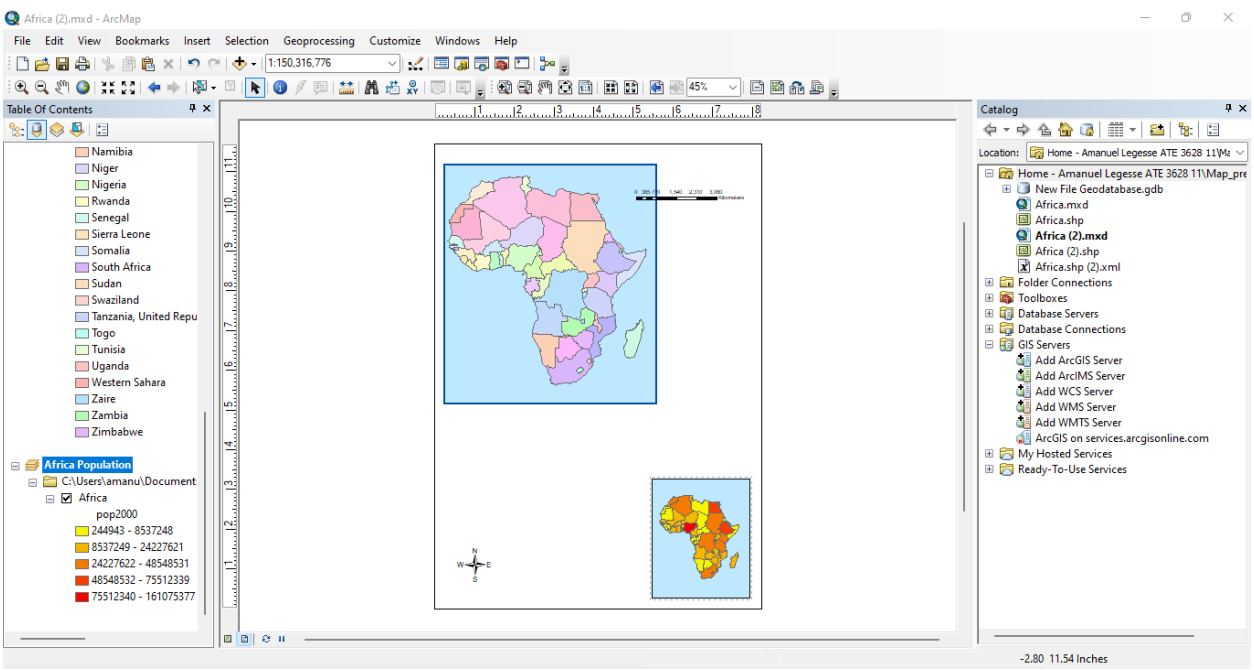
- ✓ The name of the new data frame is changed to Africa population.



- Step 5 Refine the appearance of the data frames

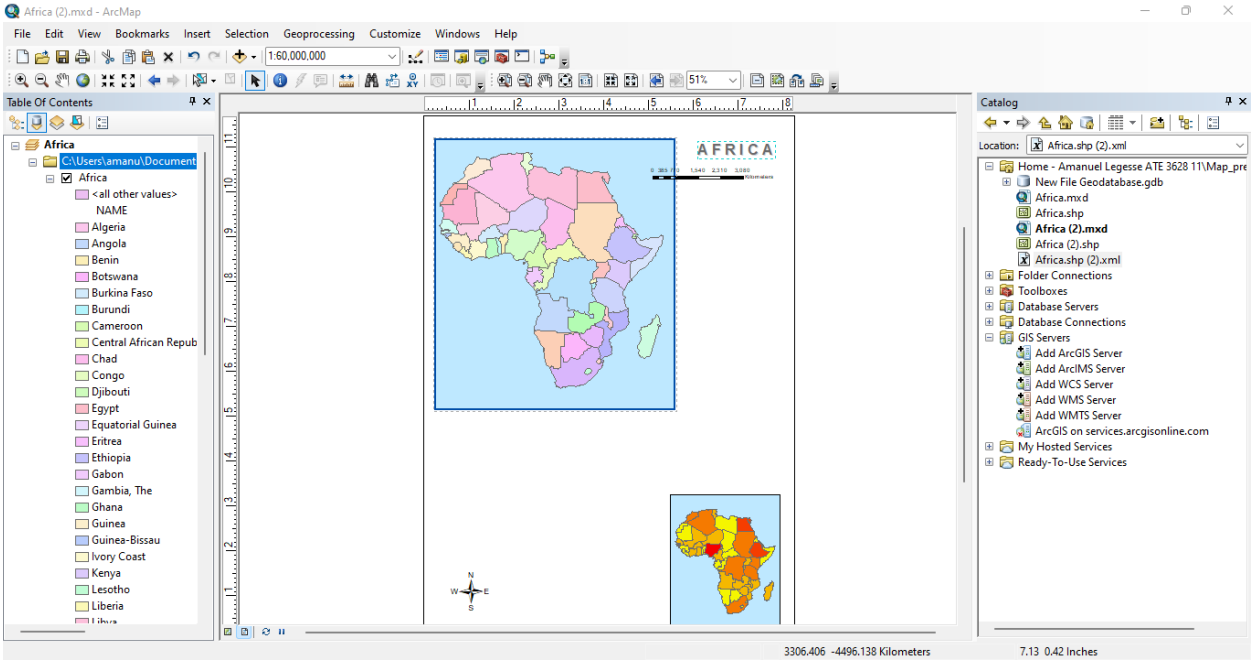
✓ Changed the frame boarder and colors.





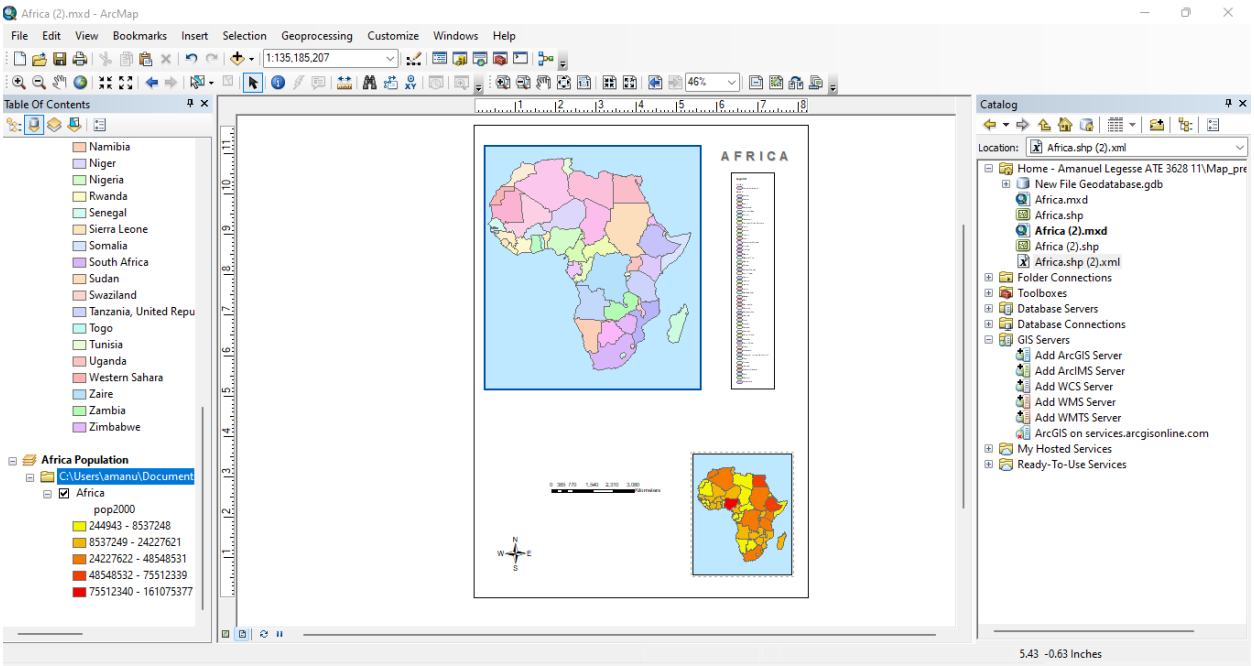
- ✓ Step 6 Add a title to the layout

- ✓ The title is now changed to AFRICA.

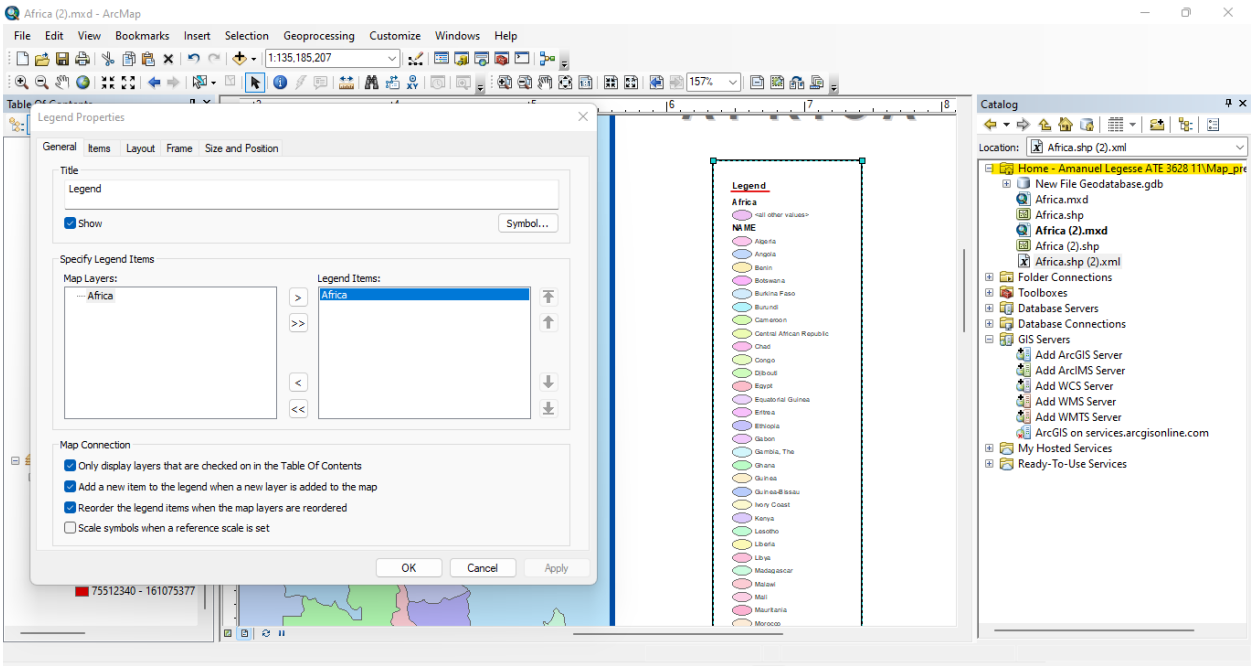


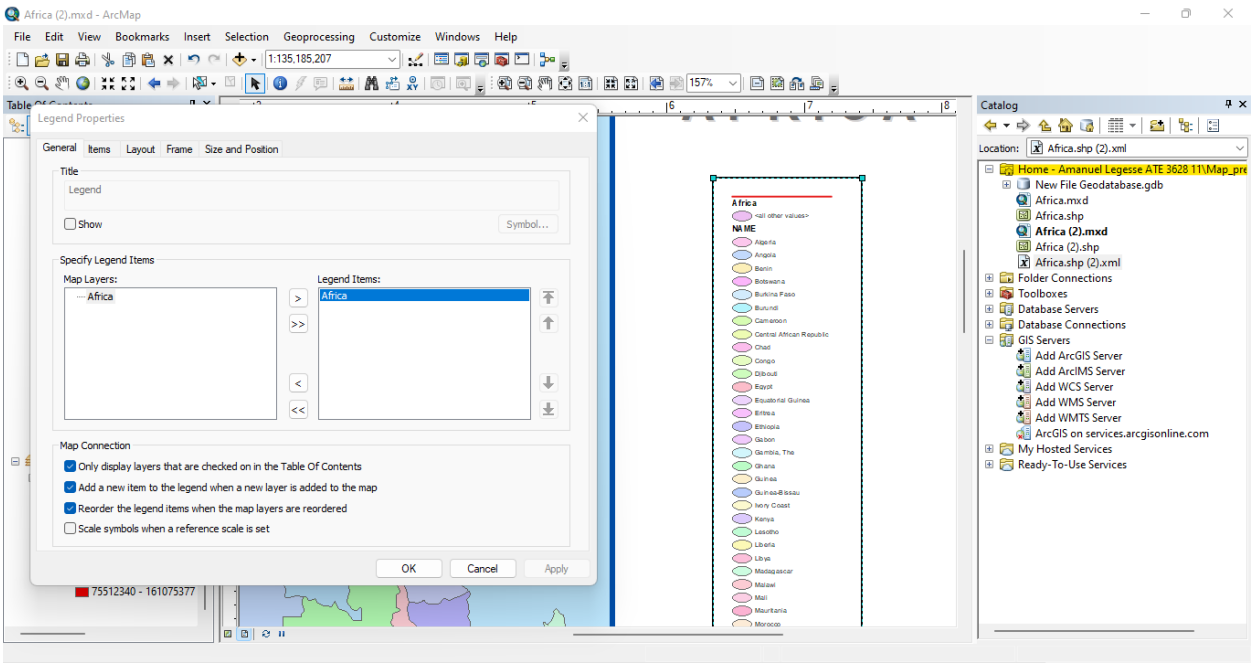
- Step 7 Add a legend to the layout

✓ The following legend has been added to the data frame using the size and position to be placed next to the Africa data frame.



✓ Unchecking the show button hides the legends title.




Africa (2).mxd - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
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157%
Legend Properties
General Items Layout Frame Size and Position
Title
Legend
Show
Symbol...
Specify Legend Items
Map Layers:
Africa
Legend Items:
Africa
Map Connection
Only display layers that are checked on in the Table Of Contents
Add a new item to the legend when a new layer is added to the map
Reorder the legend items when the map layers are reordered
Scale symbols when a reference scale is set
OK
Cancel
Apply
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Africa
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Catalog
Location: Africa.shp (2).xml
Home - Amanuel Legesse ATE 3628 11\Map_pre
New File Geodatabase.gdb
Africa.mxd
Africa.shp
Africa (2).mxd
Africa (2).shp
Africa.shp (2).xml
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
Add ArcGIS Server
Add ArcIMS Server
Add WCS Server
Add WMS Server
Add WMTS Server
ArcGIS on services.arcgisonline.com
My Hosted Services
Ready-To-Use Services

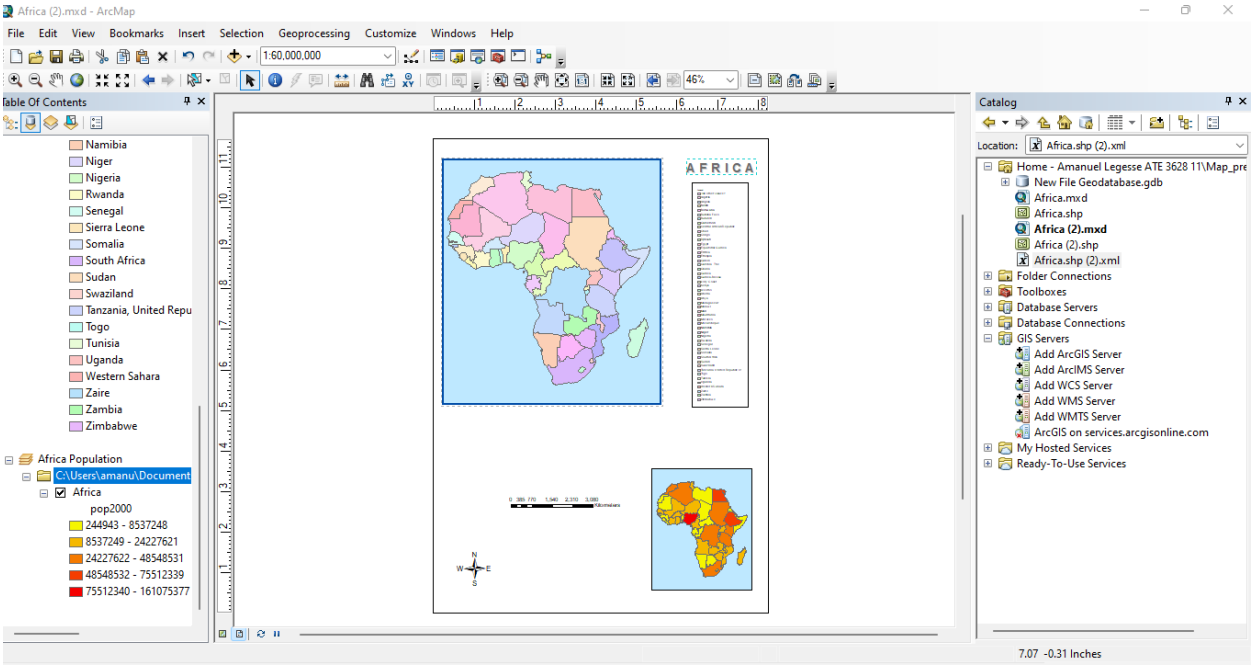
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Table Of Contents
Namibia
Niger
Nigeria
Rwanda
Senegal
Sierra Leone
Somalia
South Africa
Sudan
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Tanzania, United Repu
Togo
Tunisia
Uganda
Western Sahara
Zaire
Zambia
Zimbabwe
Africa Population
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8537249 - 24227621
24227622 - 48548531
48548532 - 75512339
75512340 - 161075377
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Home - Amanuel Legesse ATE 3628 11\Map_pre
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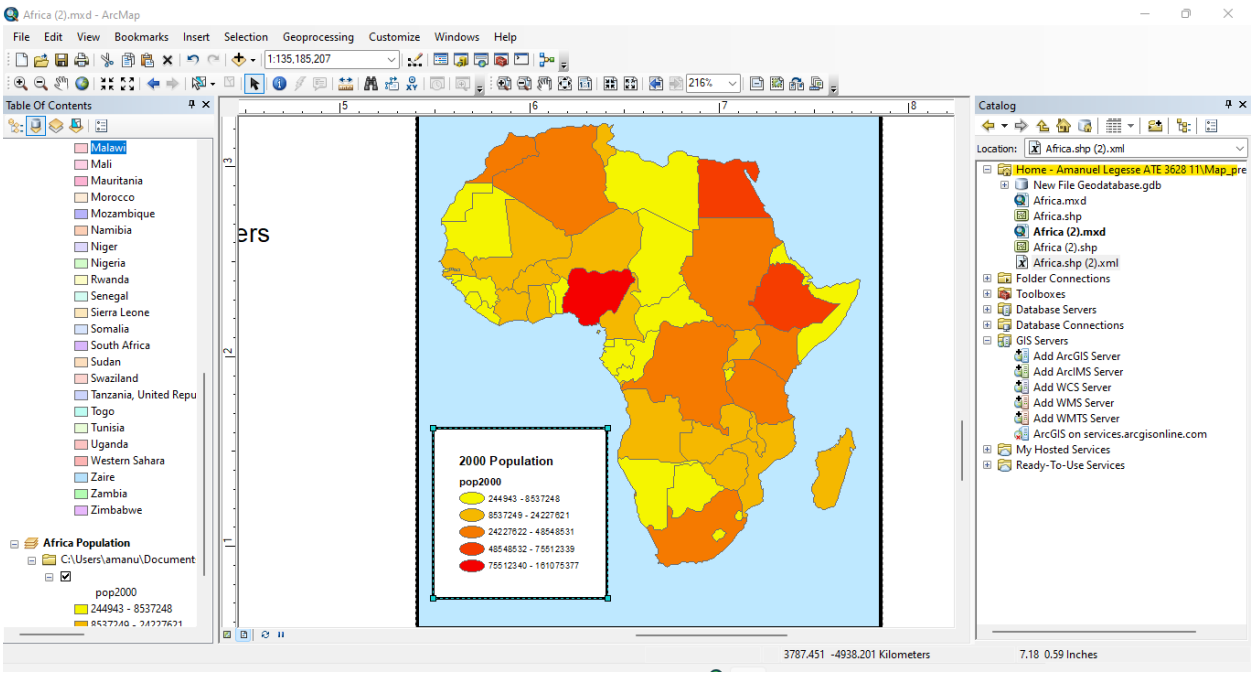
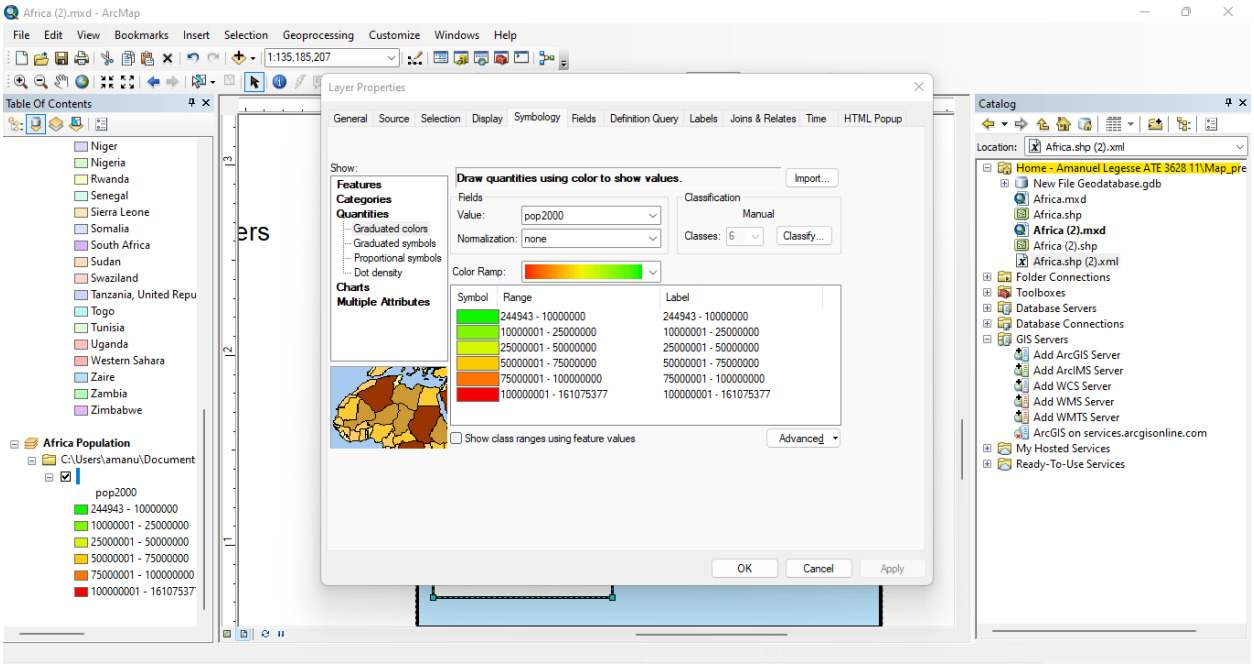
Africa.mxd
Africa.shp
Africa (2).mxd
Africa (2).shp
Africa.shp (2).xml
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
Add ArcGIS Server
Add ArcIMS Server
Add WCS Server
Add WMS Server
Add WMTS Server
ArcGIS on services.arcgisonline.com
My Hosted Services
Ready-To-Use Services
7.07 -0.31 Inches

- Step 8 Add a legend for the map inset

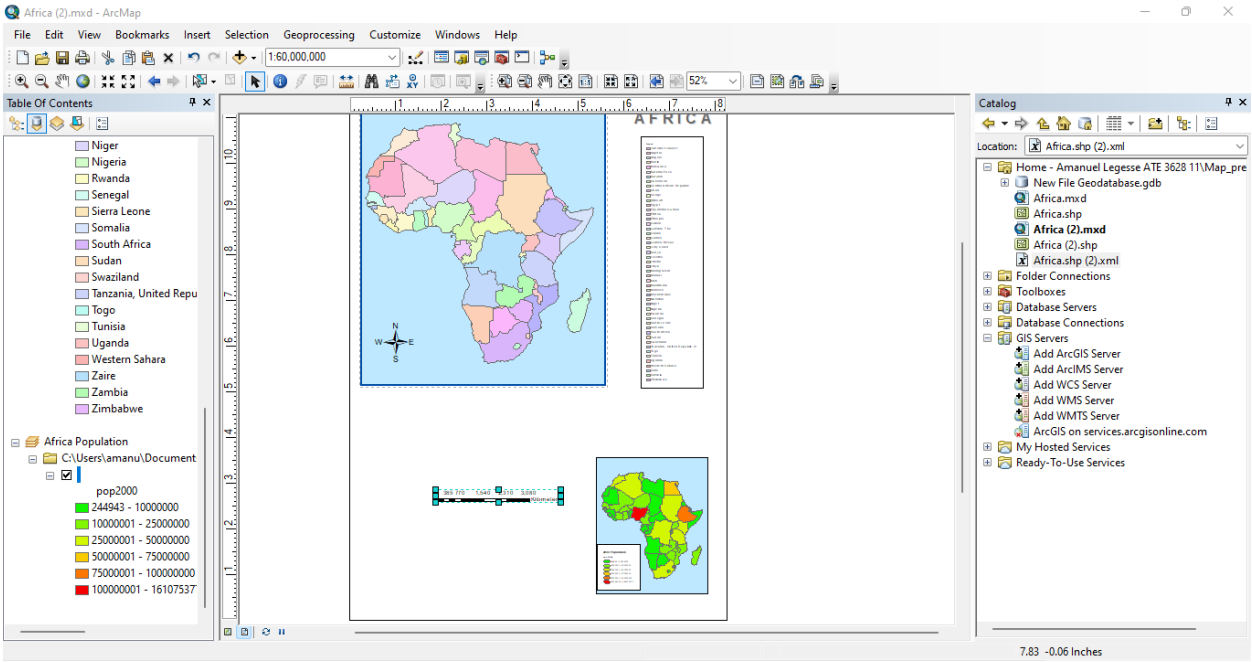
✓ A legend is created with title 2000 population and resized to fit inside the Africa population data frame.



✓ Changed to color ramp to red to green then flipped it then modified the range values.

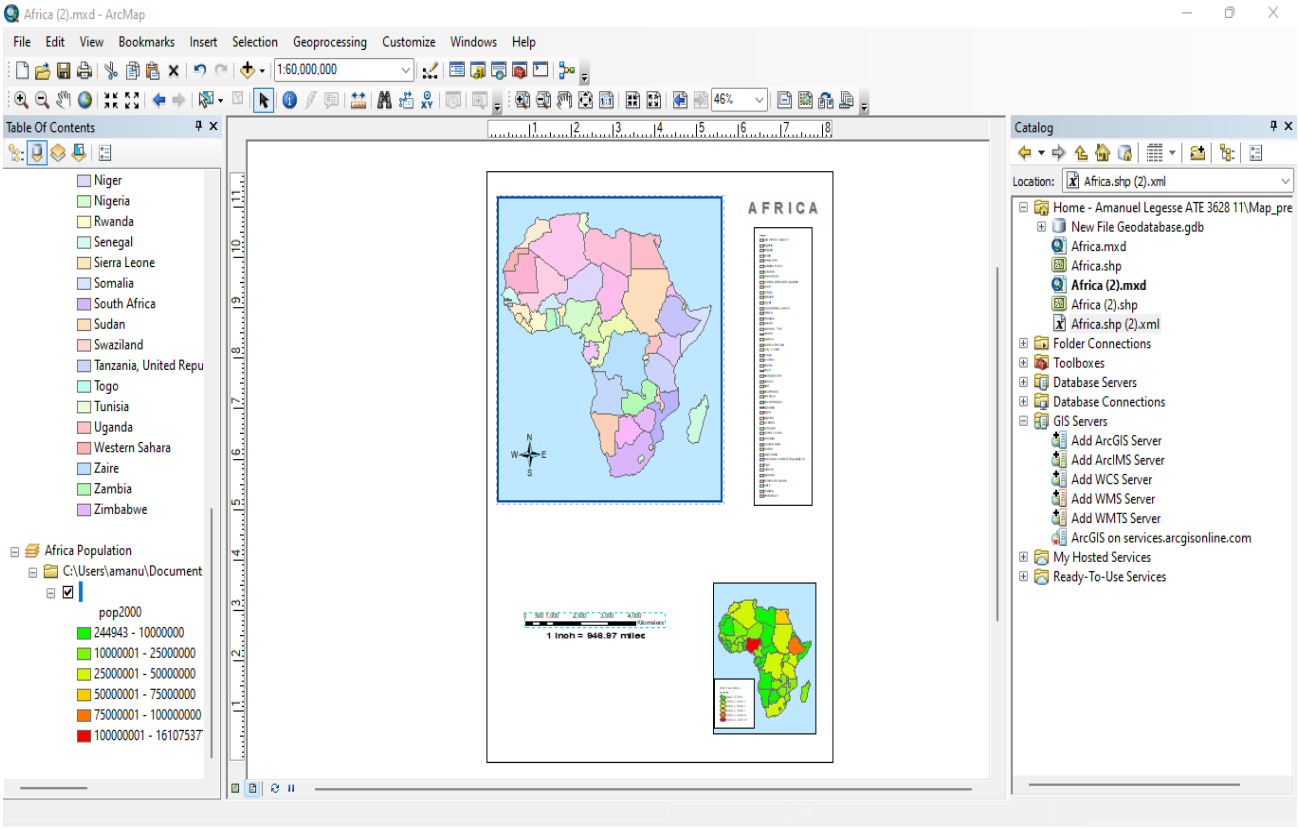


- Step 9 Position the north arrow



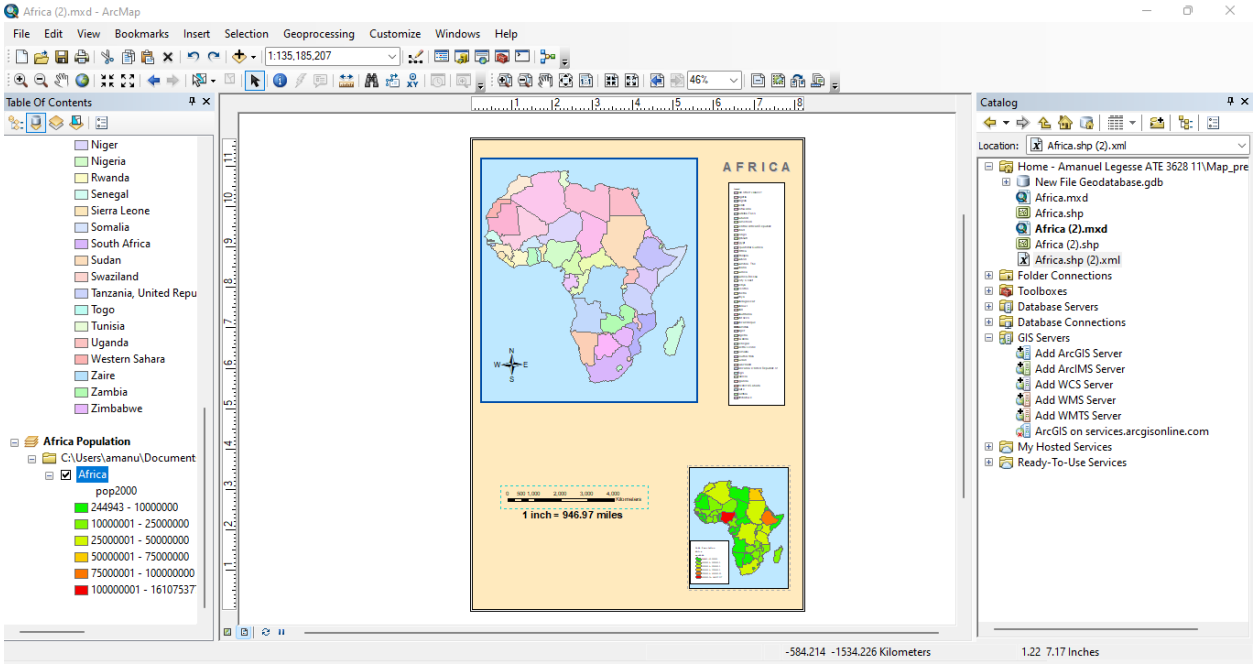
- Step 10 Modify the scale bar and add scale text.

Modified scale km to 1000.

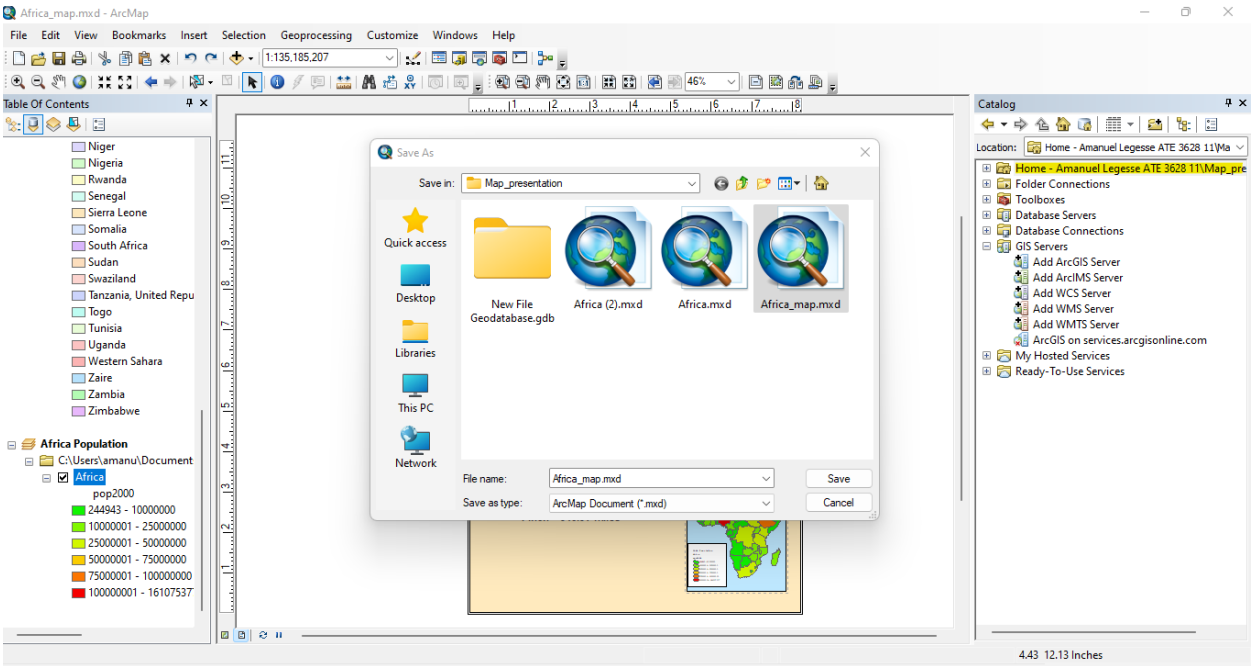


- Step 11 Add a border and background color to your layout

✓ Added a back ground layout of color sand by inserting Neatline.



- Step 12 Save your map



ARC-GIS

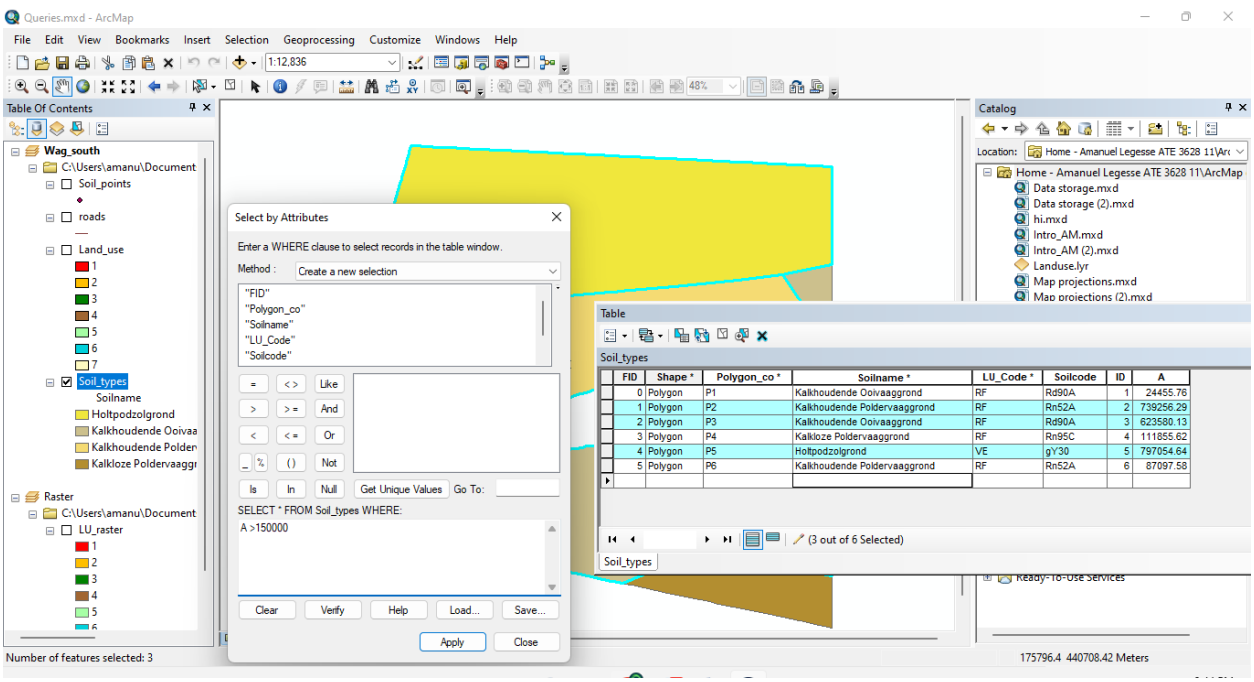
EXCERCISE: 5

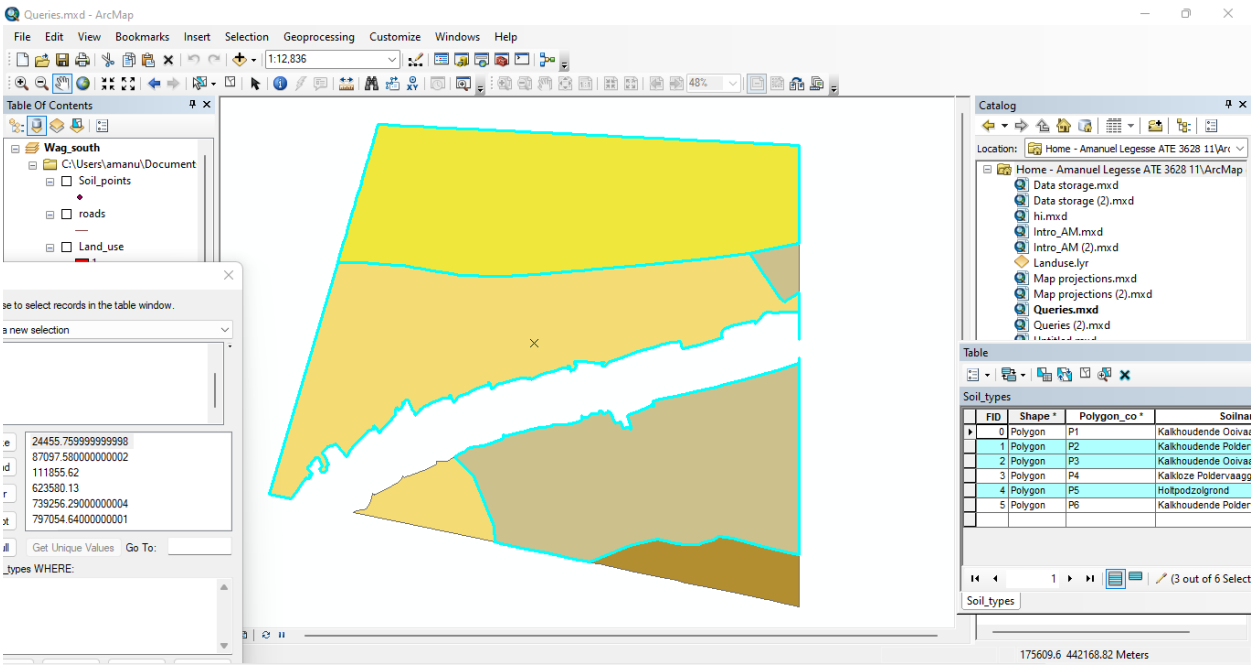
ArcGIS

QUERIES

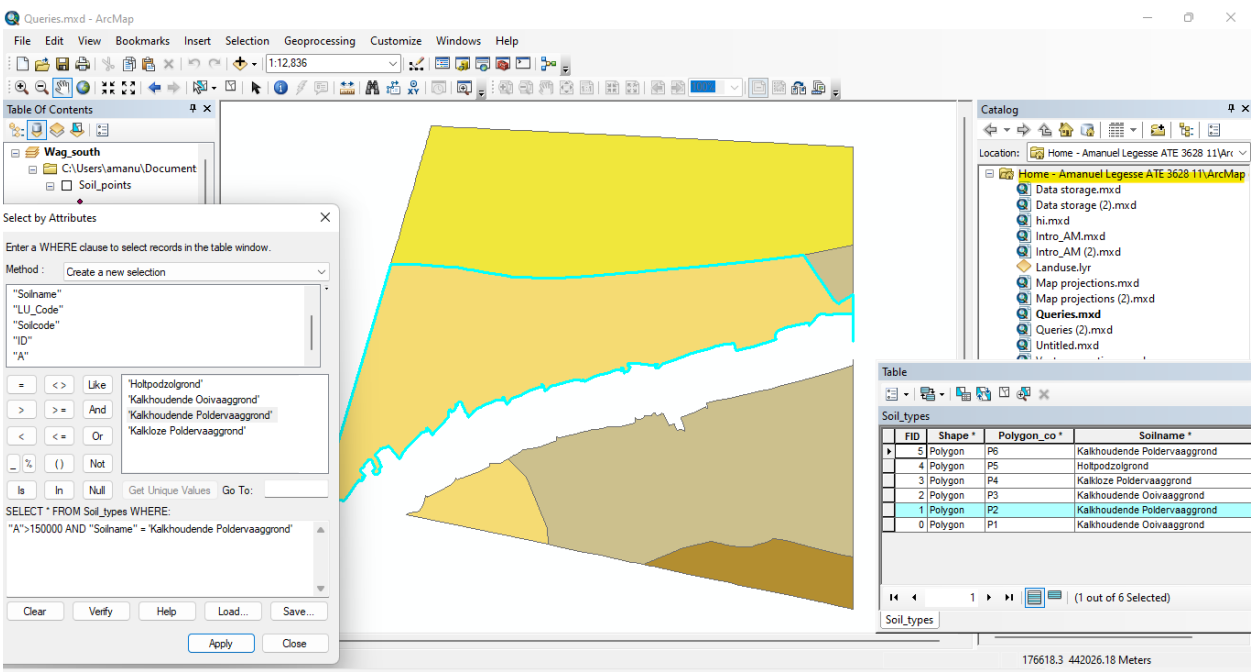
Attribute data queries

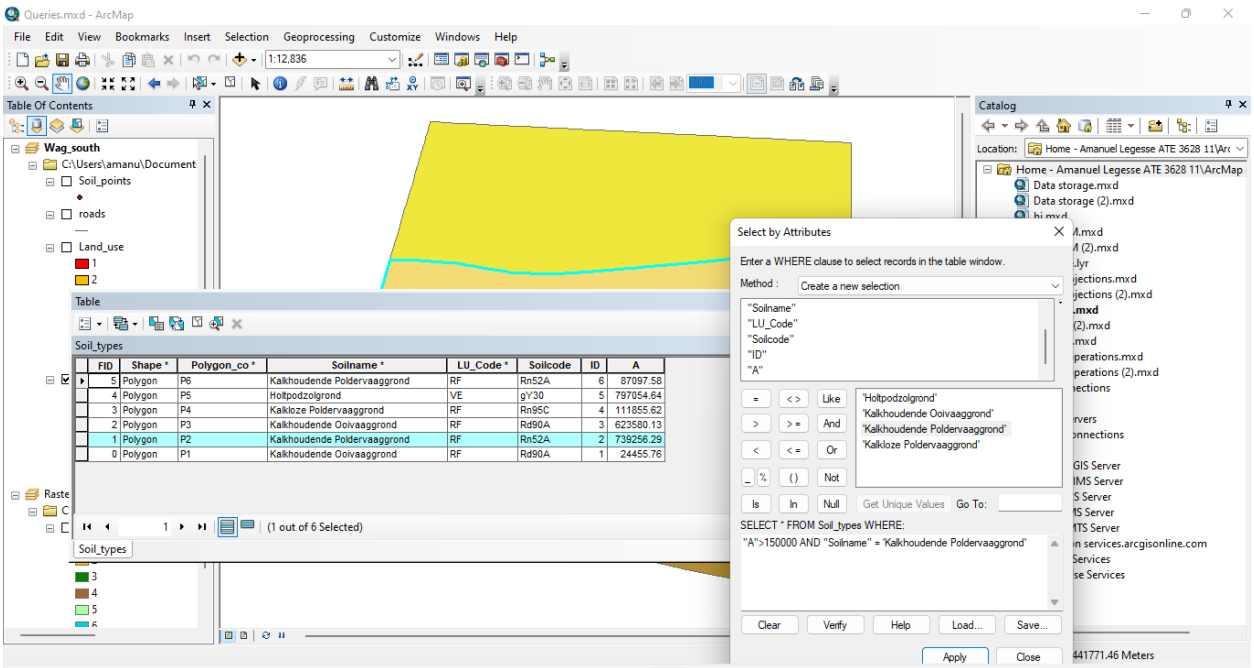
1. A: 3 records are selected



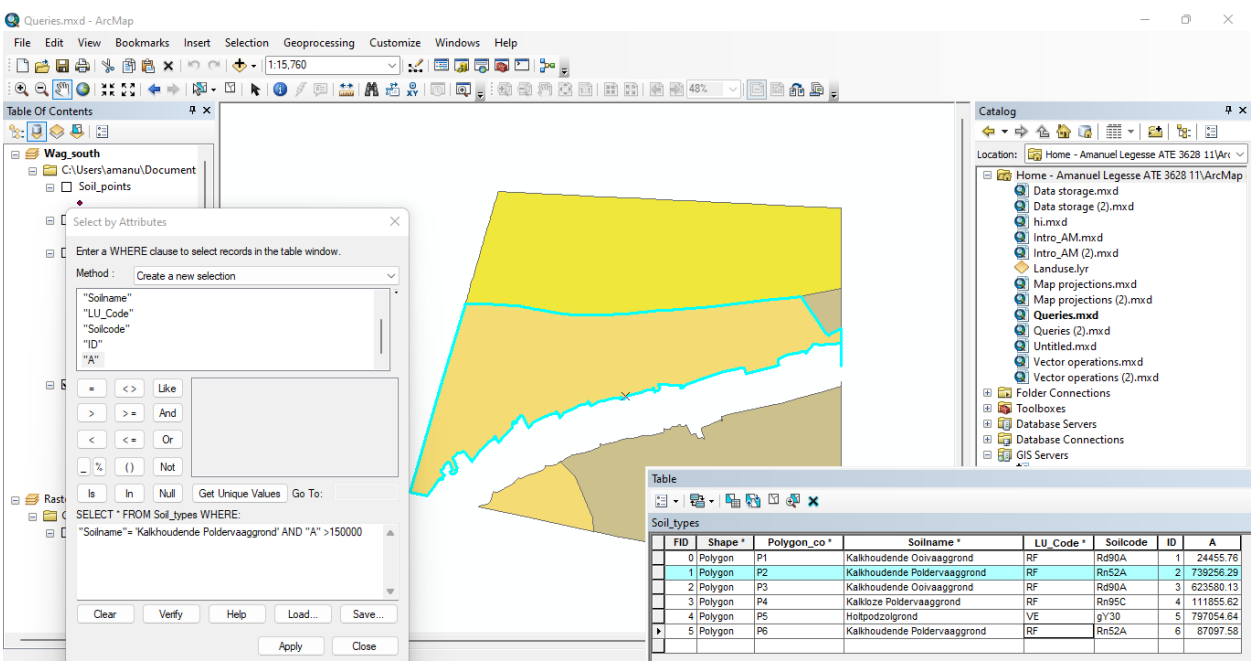


B: There is 1 kalkhoudende poldervaaggrond records selected





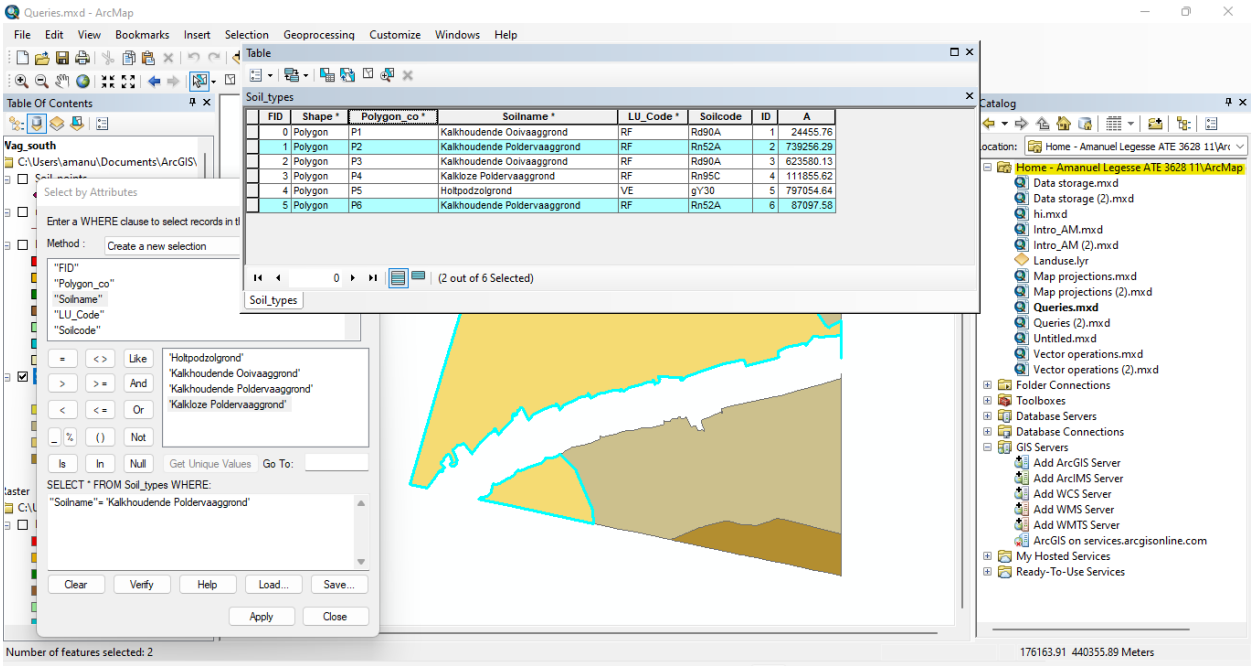
C: Yes the selection can be made at once using the Boolean expression AND.



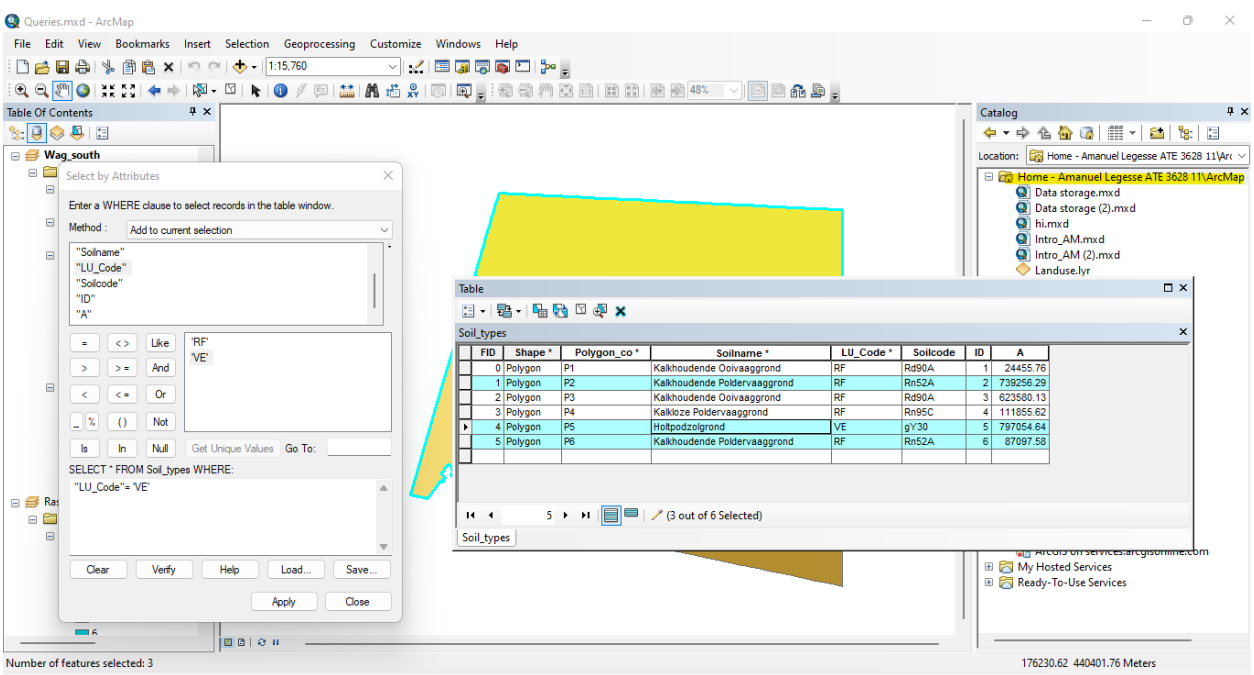
D: Select: "Soilname"

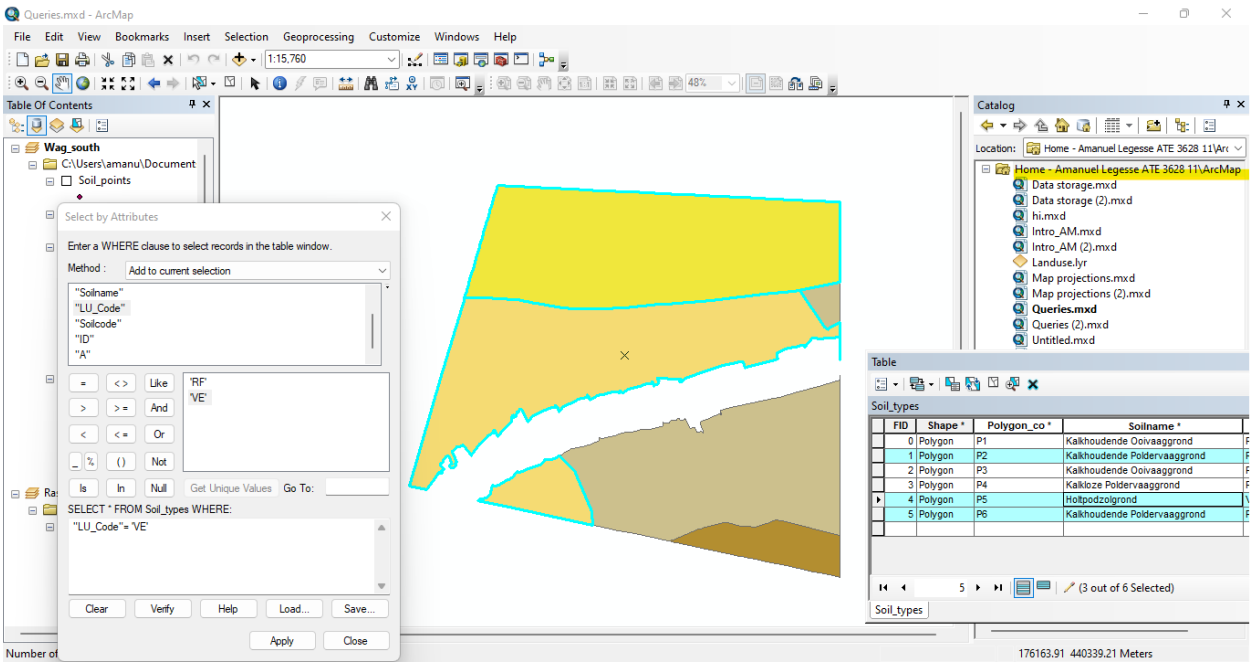
From: Soil_types

Where: "Soilname"= 'Kalkhoudende Poldervaaggrond'

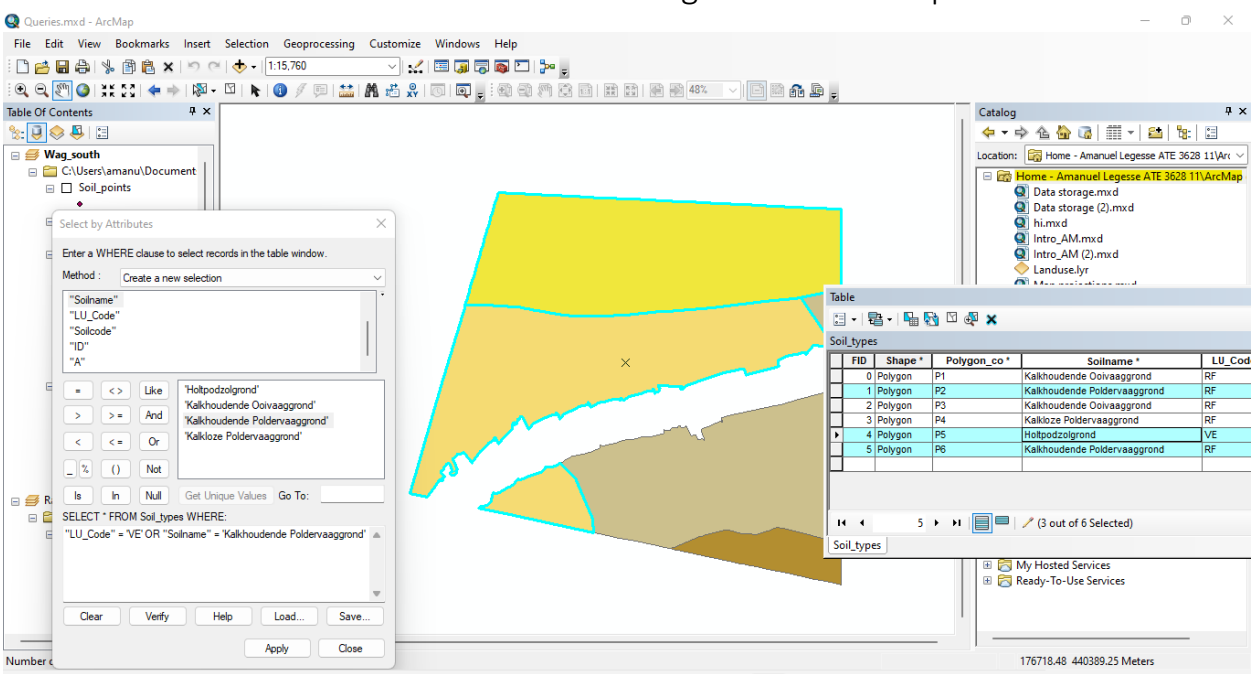


E: 3 records are selected after adding features with LU_code 'VE'



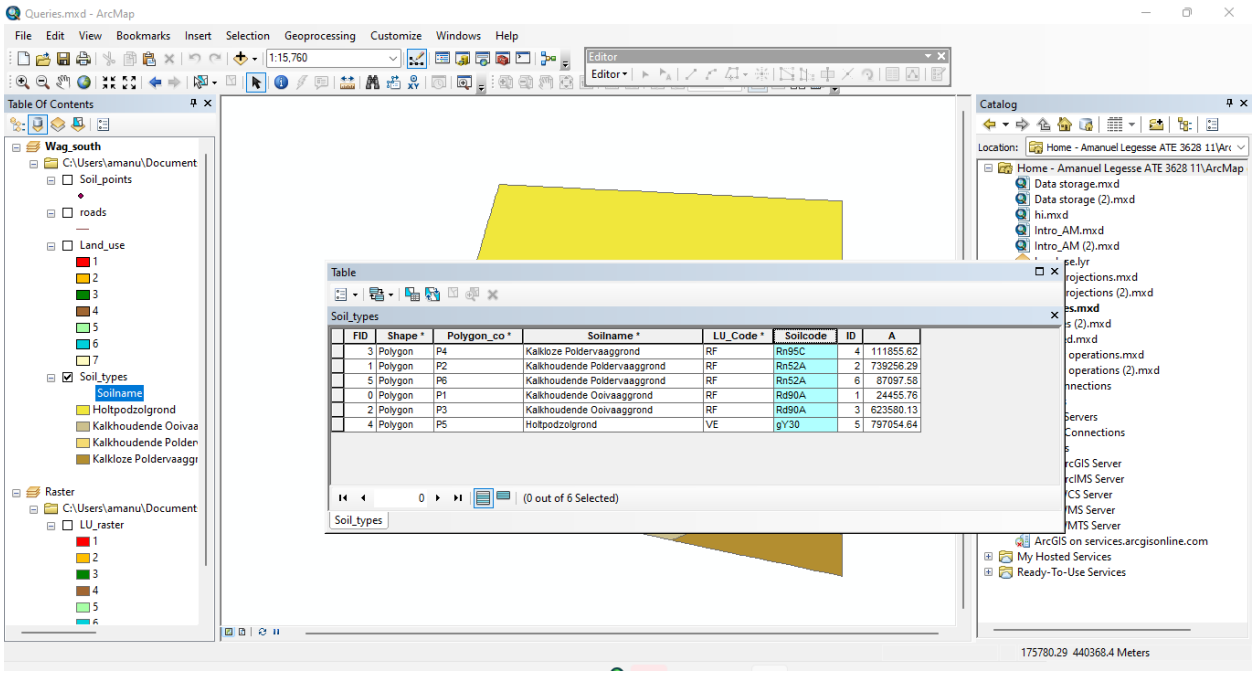


F: Yes the selection can be made at once using the Boolean expression OR.



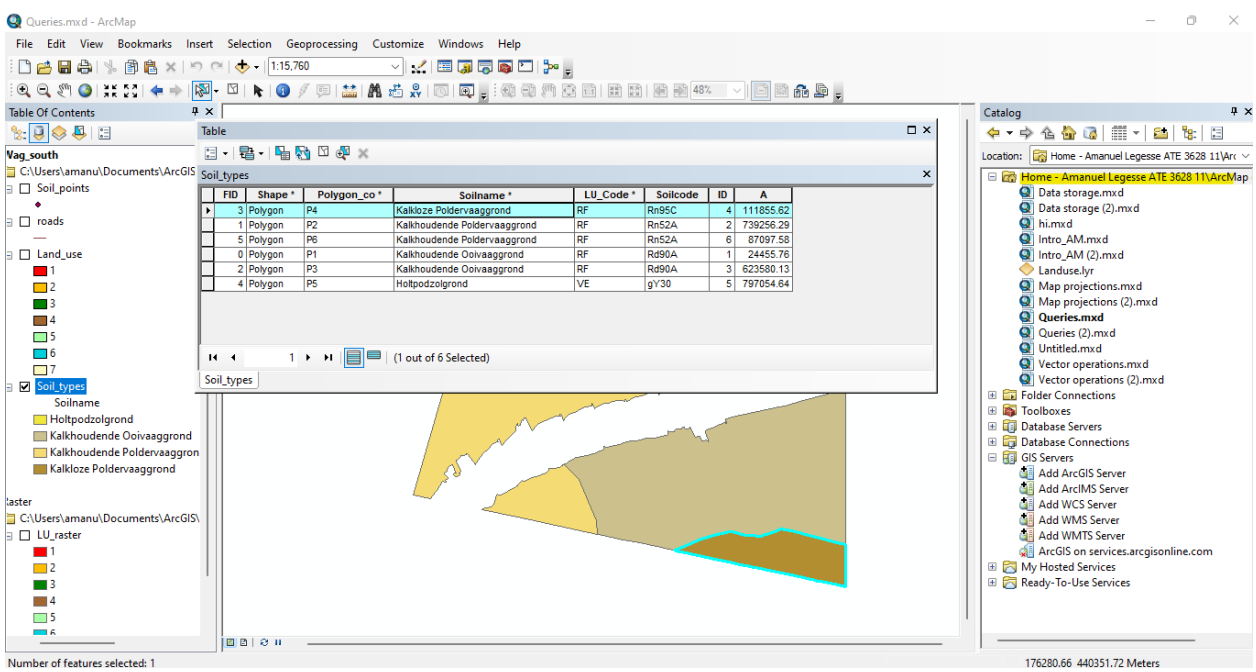
Sorting attributes

2. polygon_co is sorted in a descending order as seen below.



Feature selection by cursor

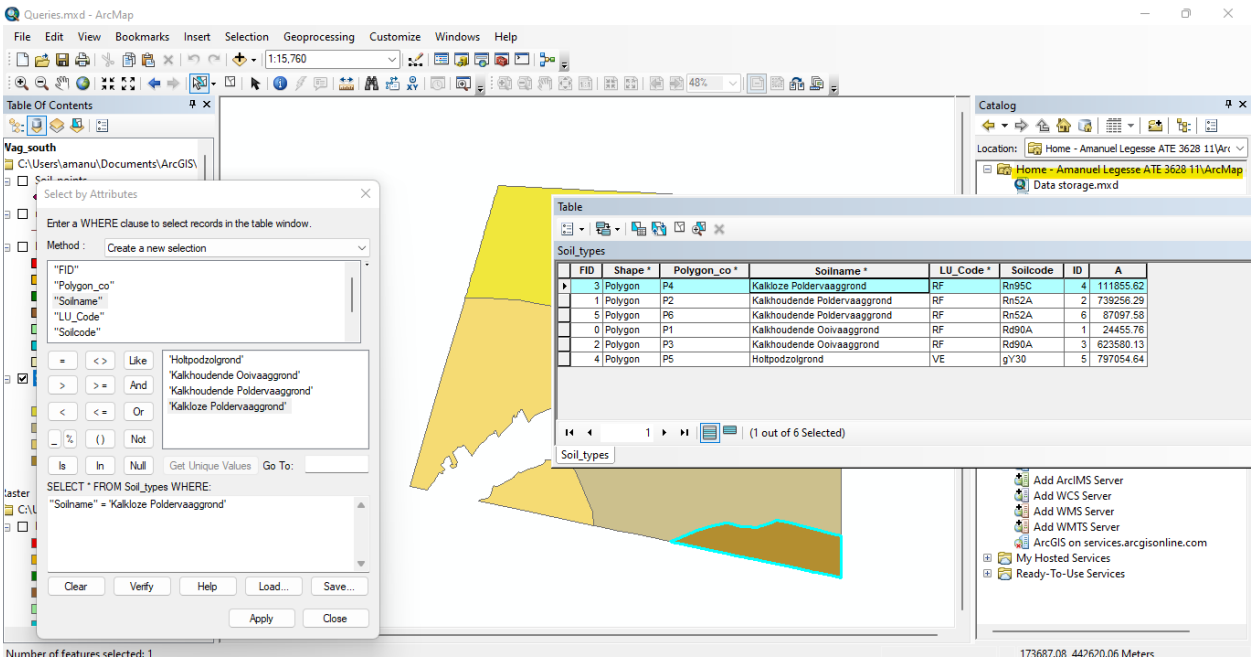
3. A:



B: Select: "Soilname"

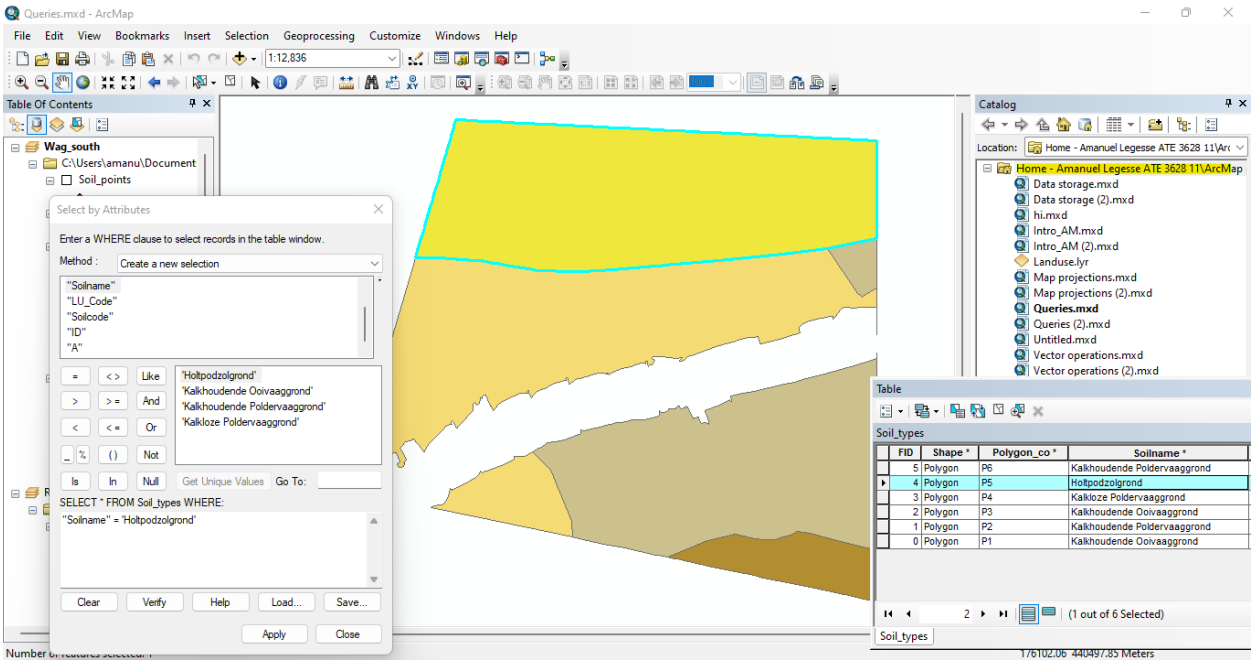
From: Soil_types

Where: "Soilname"= ' Kalkloze poldervaaggrond’



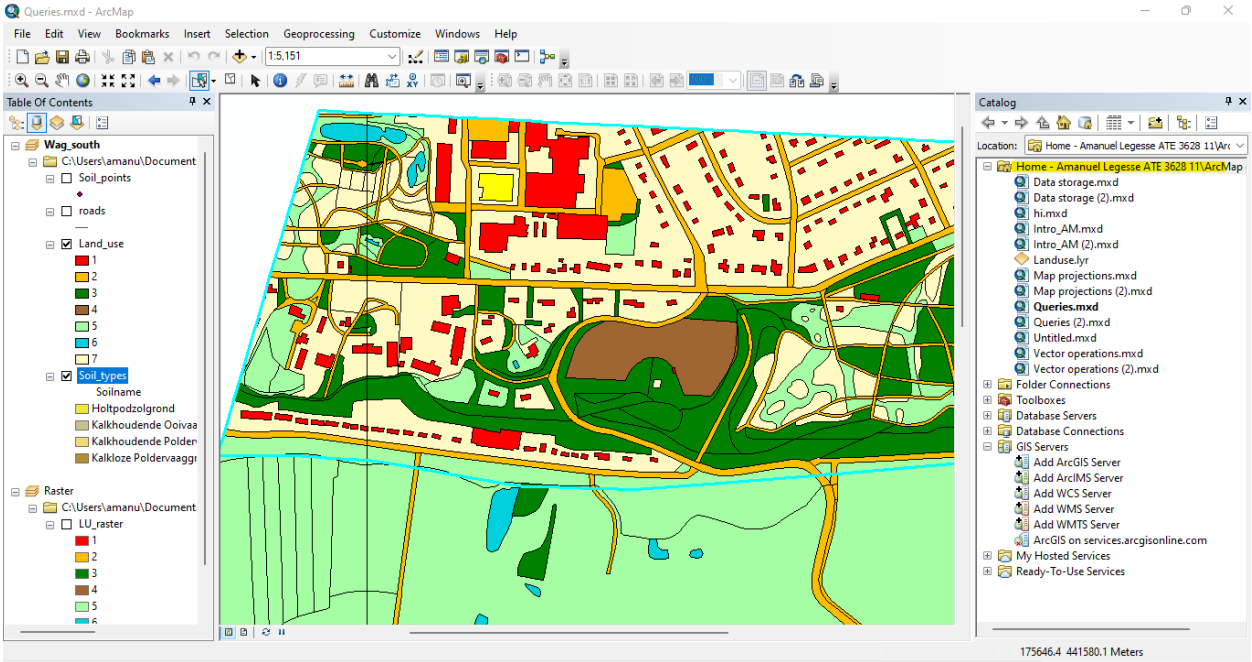
FID	Shape *	Polygon_co *	Soilname *	LU_Code *	Soilcode	ID	A
3	Polygon	P4	Kalkloze Poldervaaggrond	RF	Rn95C	4	111855.62
1	Polygon	P2	Kalkhoudende Poldervaaggrond	RF	Rn52A	2	739256.29
5	Polygon	P6	Kalkhoudende Poldervaaggrond	RF	Rn52A	6	87097.58
0	Polygon	P1	Kalkhoudende Ooivaaggrond	RF	Rd90A	1	24455.76
2	Polygon	P3	Kalkhoudende Ooivaaggrond	RF	Rd90A	3	623580.13
4	Polygon	P5	Holtpodzolgrond	VE	gY30	5	797054.64

C. After removing the most southern soil feature which is 'Kalkloze Poldervaaggrond', the most northern one ('Holtpodzolgrond') is selected.

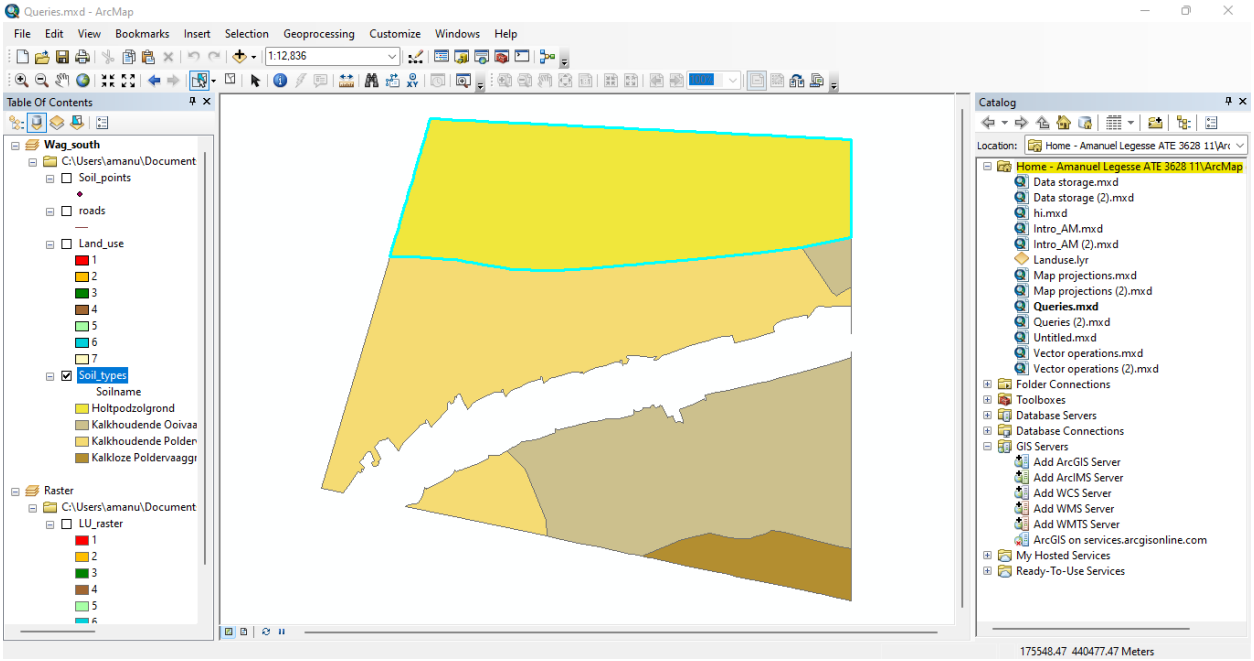


4.

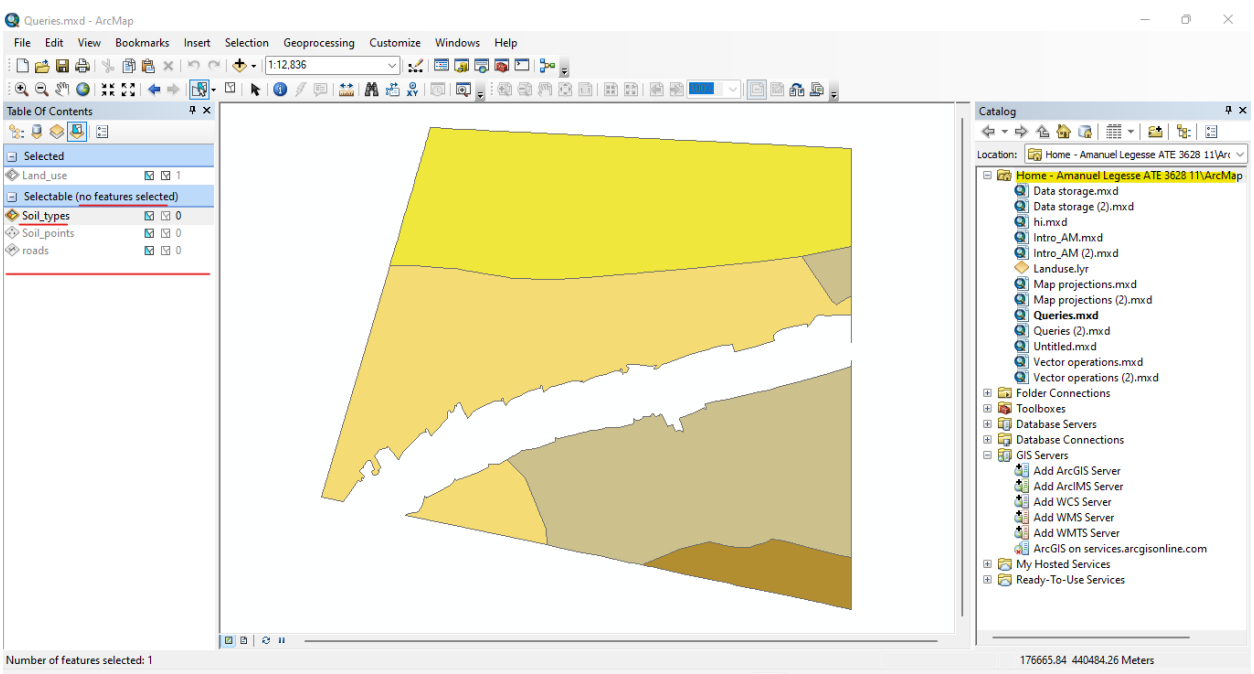
A: The selected feature which is the mathematics building is highlighted as yellow.



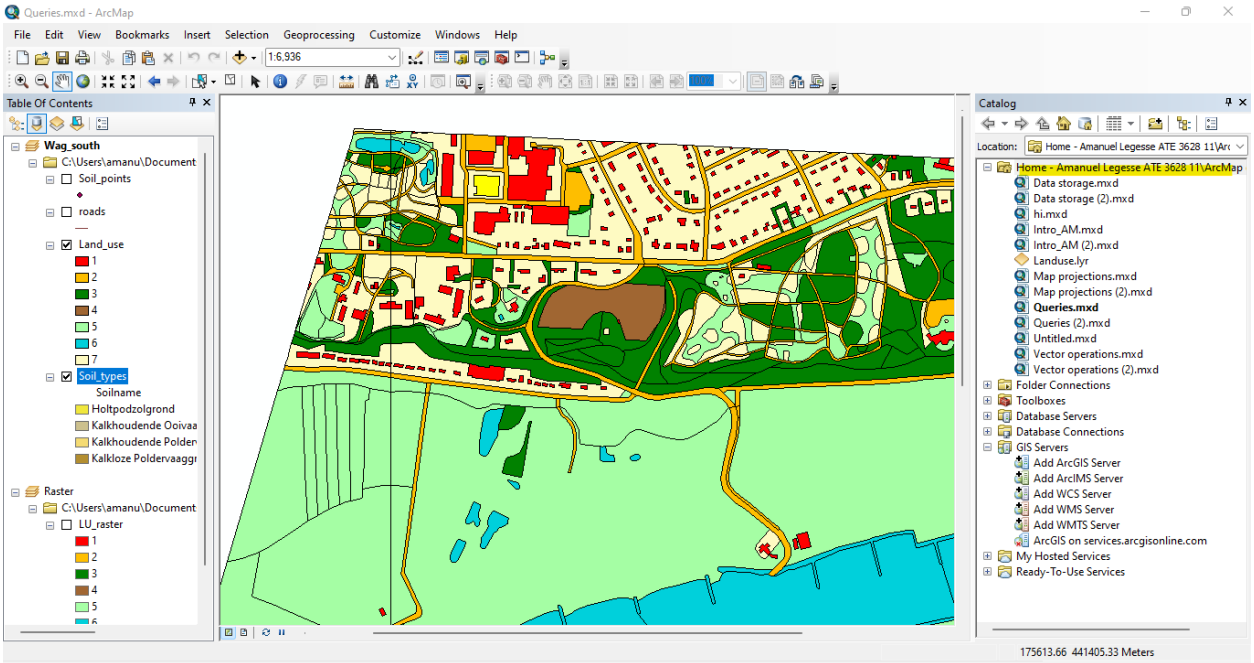
- The mathematics building also the soil feature in which the building is located is selected

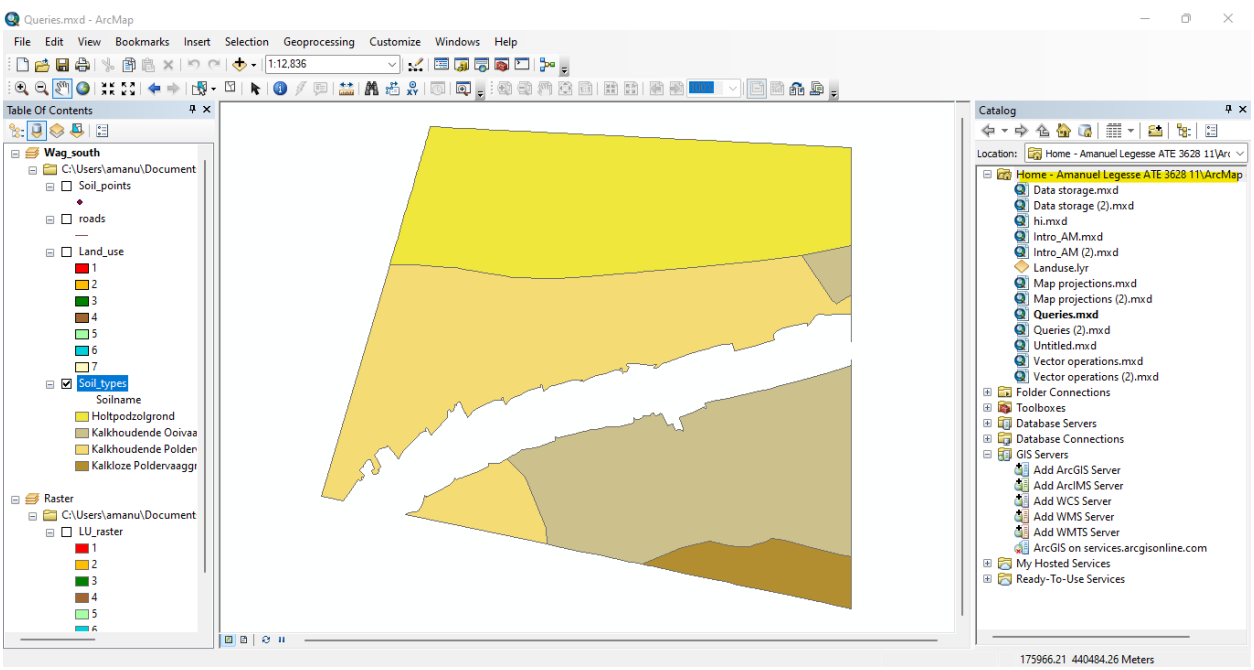


B:

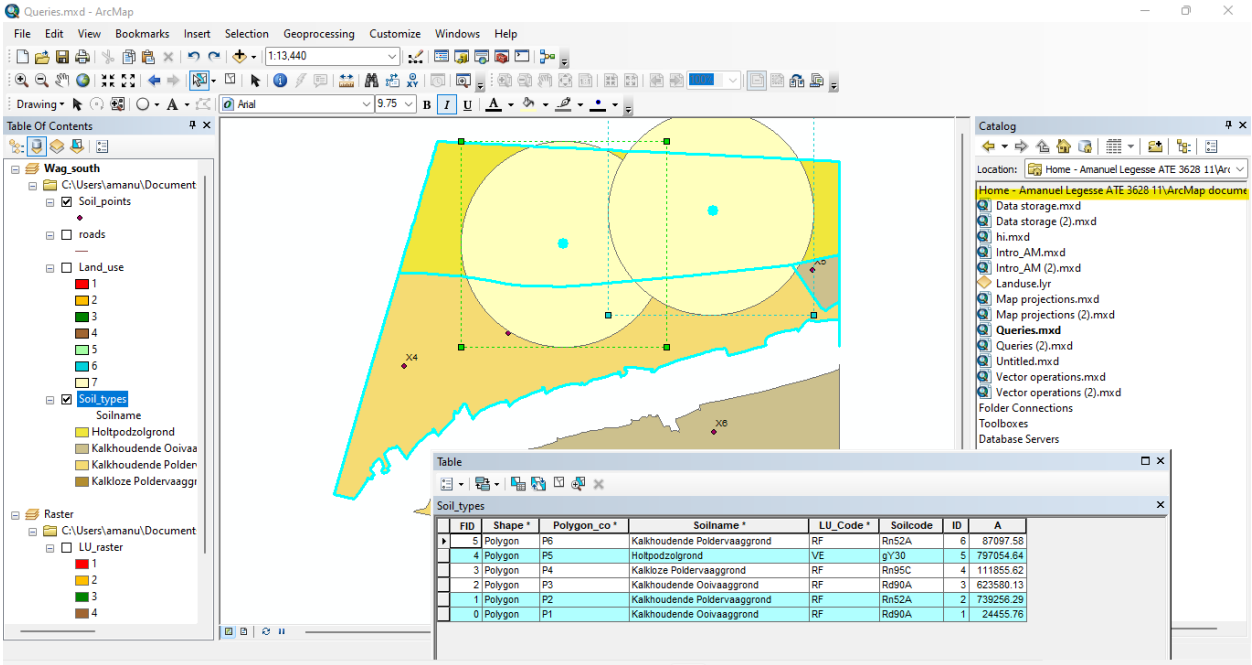


C: Now that the soil_types has been made not selectable the mathematics building is selected t and not the soil feature on which this building is located.

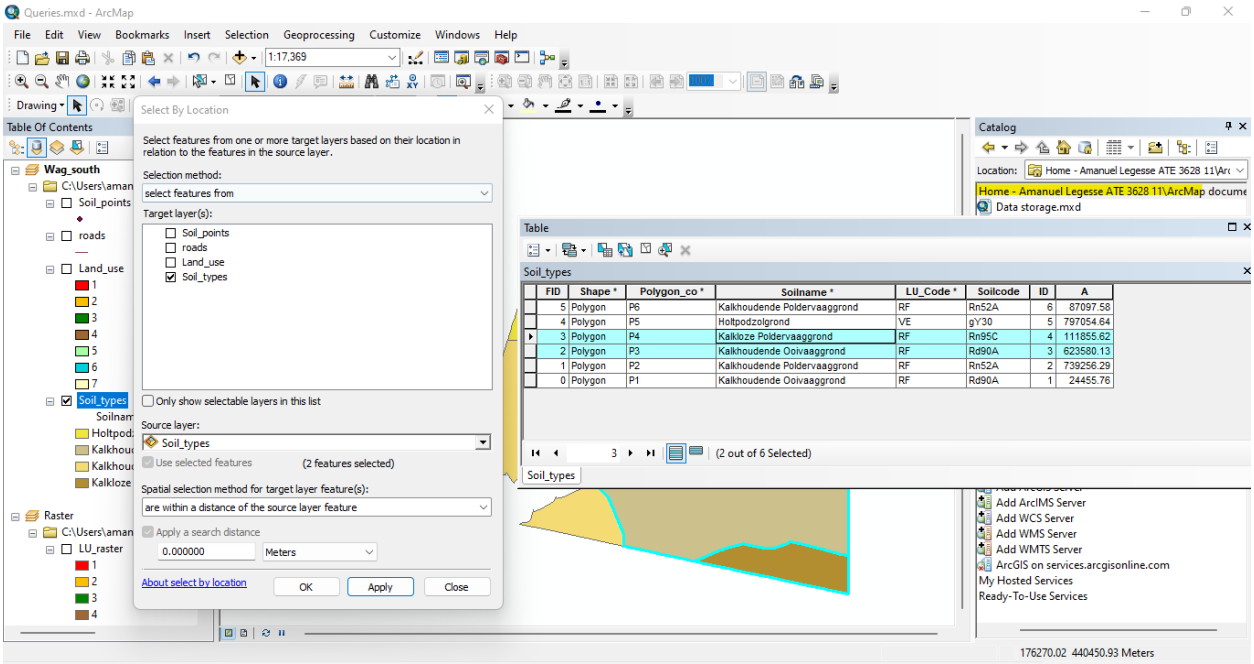




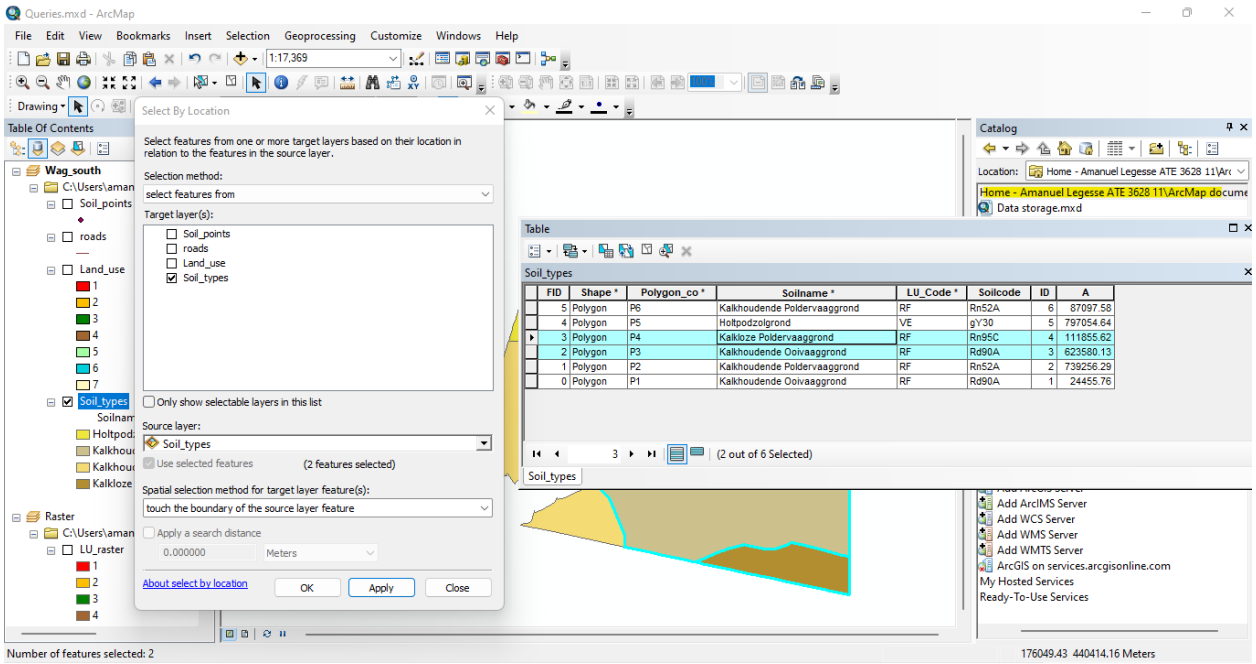
5. The soil codes of the selected features are Rd90A, Rn52A and gY30.



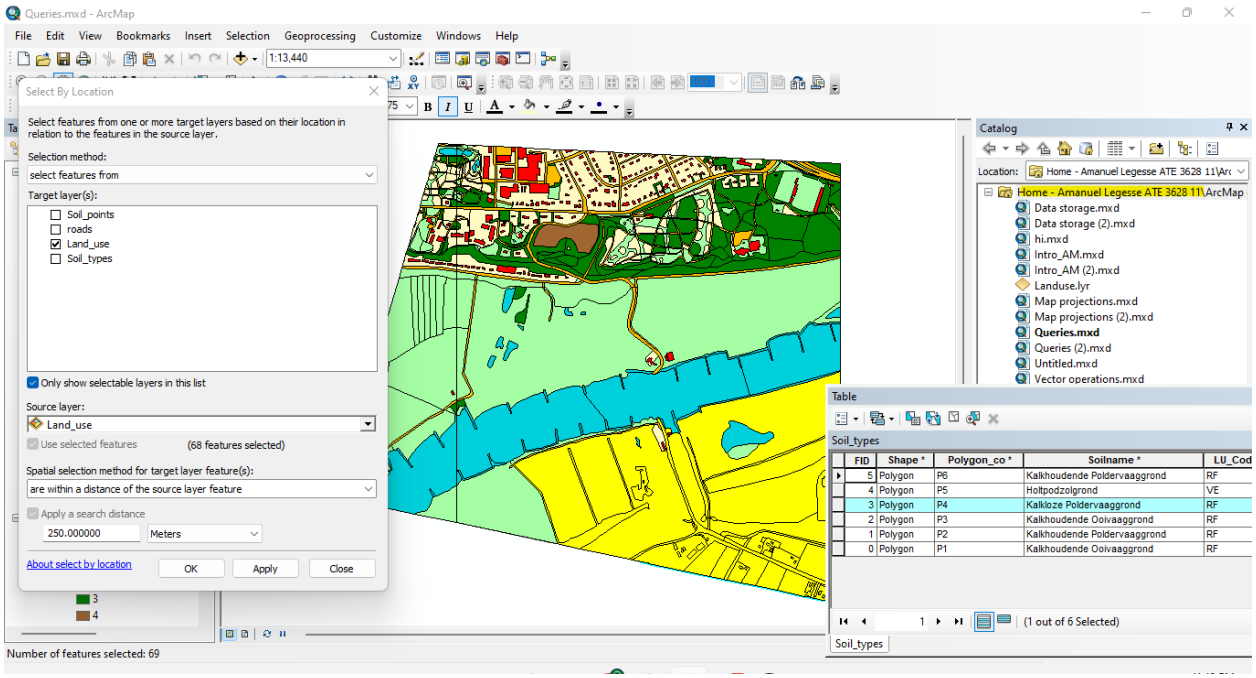
6. A: 2 features are selected, 'kalkloze poldervaaggrond' and 'kalkhoudende ooivaaggrond'



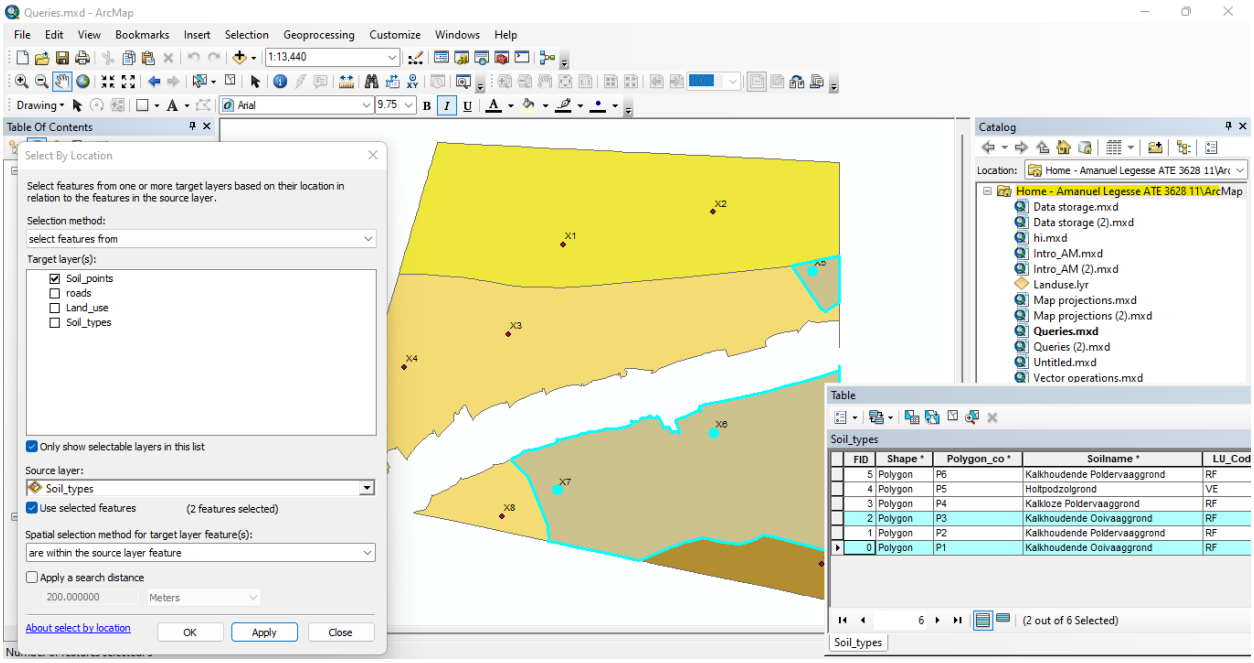
B: By using ‘touch the boundary of’ spatial relationship, there can be made the same selection.



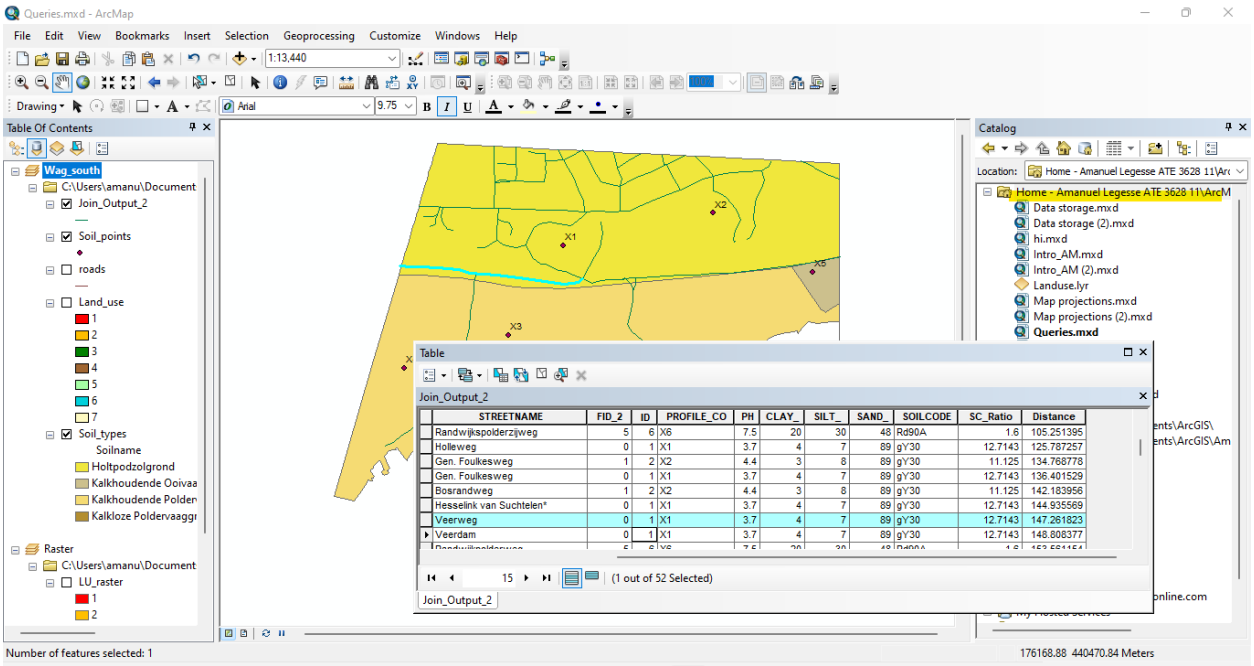
C: This selection results in 68 selected features in the land_use dataset.



7. Point X5, X6, X7 are within the soil features classified as ‘Kalkhoudende Ooivaaggrond’.

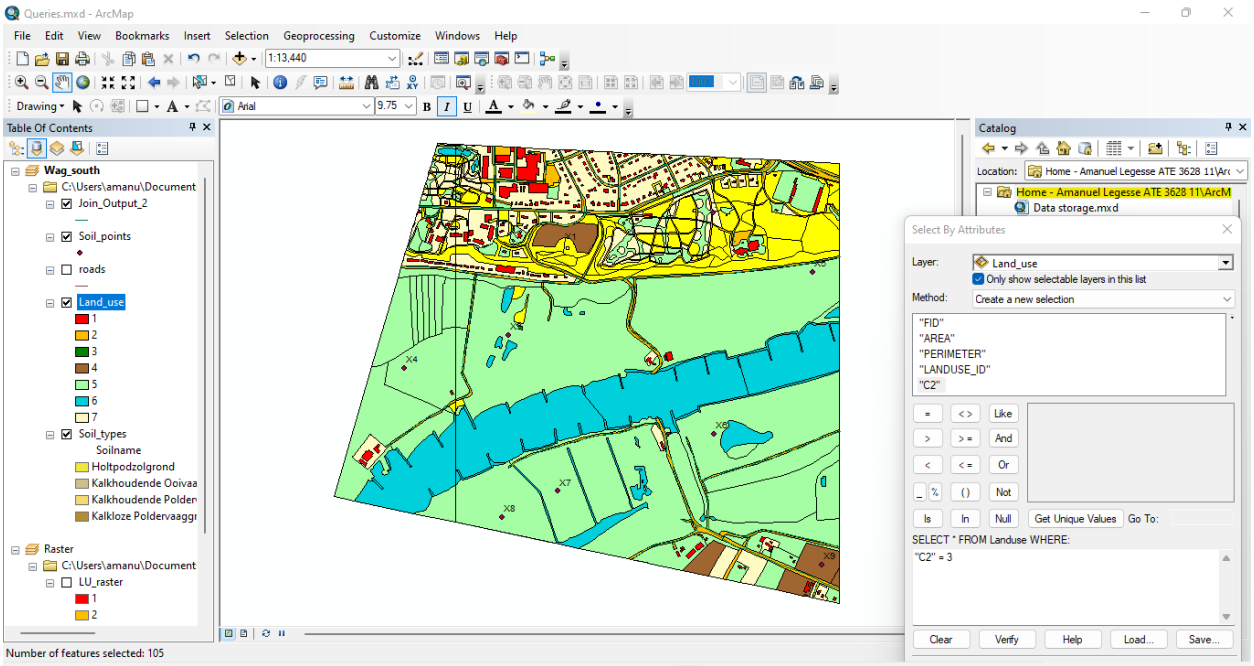


8. A: The nearest soil profile point to the Veerweg is point X1.
B: The distance is 147.3 meters.

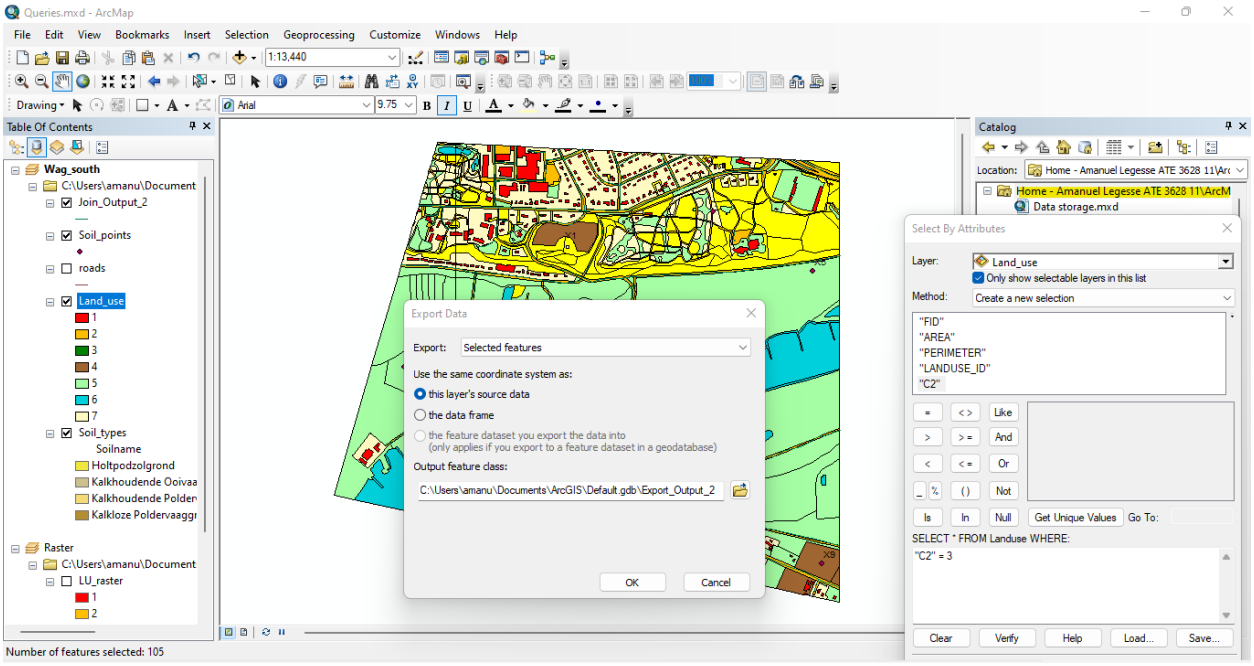


Saving a selection into a new vector dataset

9. A:



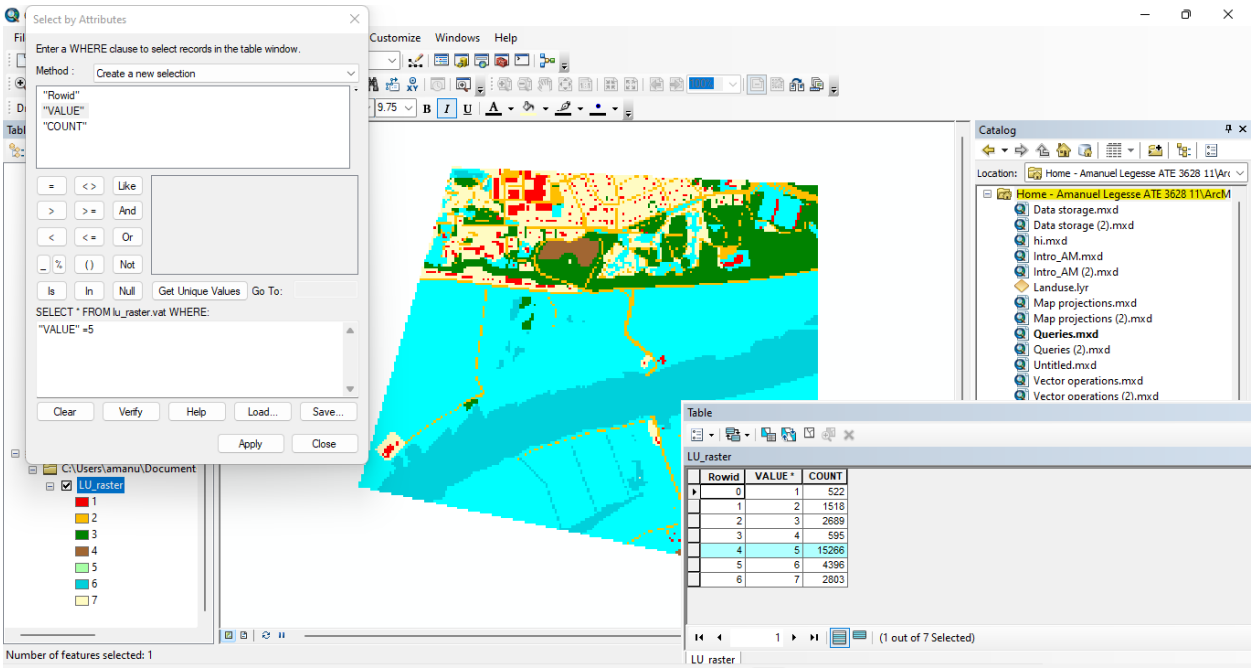
B:



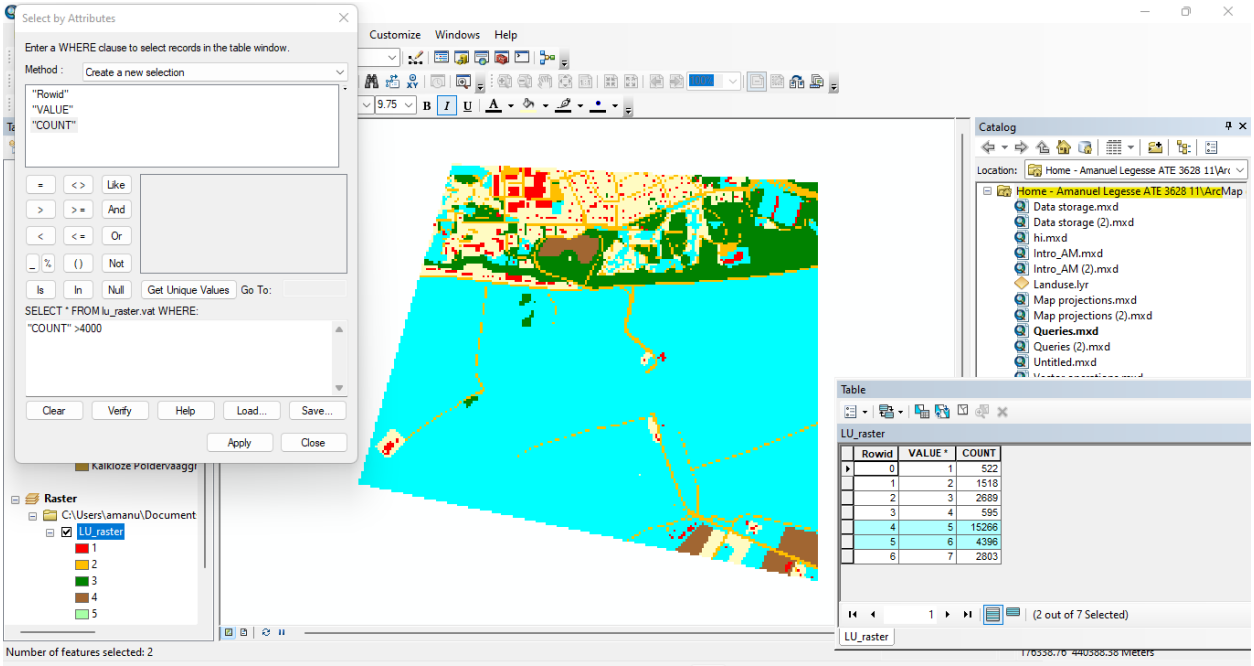
Selecting and exporting raster cells using the ‘CON’ tool

10.

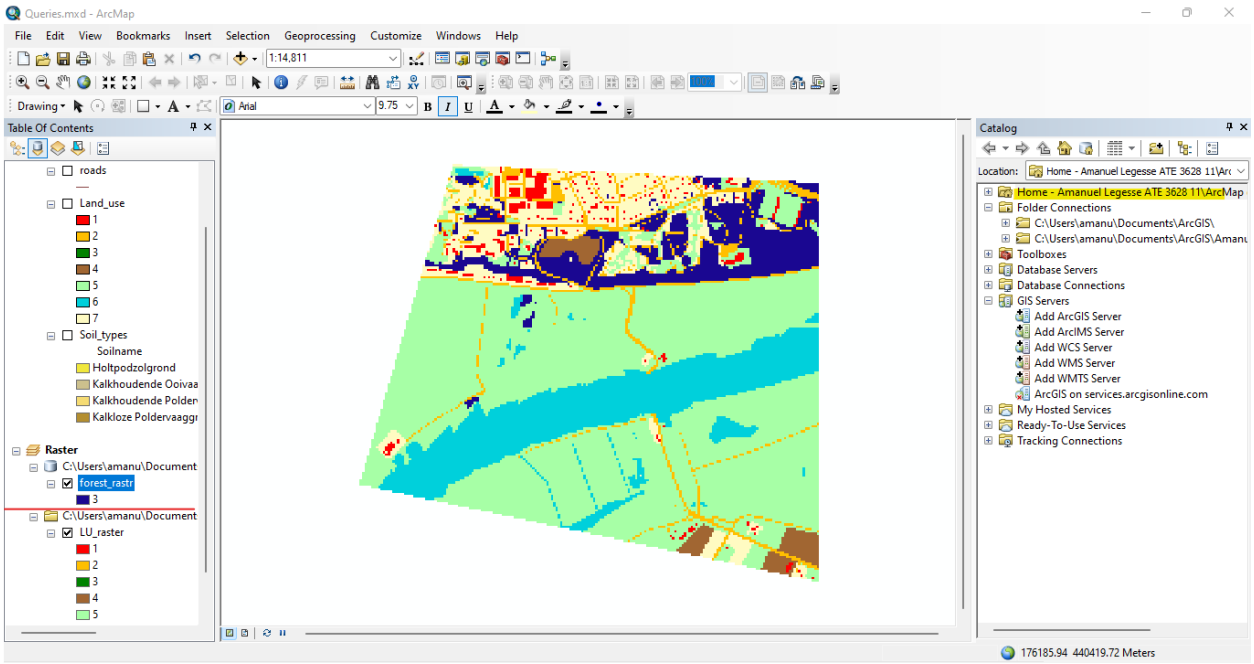
A: 15266 cells are selected.



B: Classes with value 5 and 6 are selected.



C: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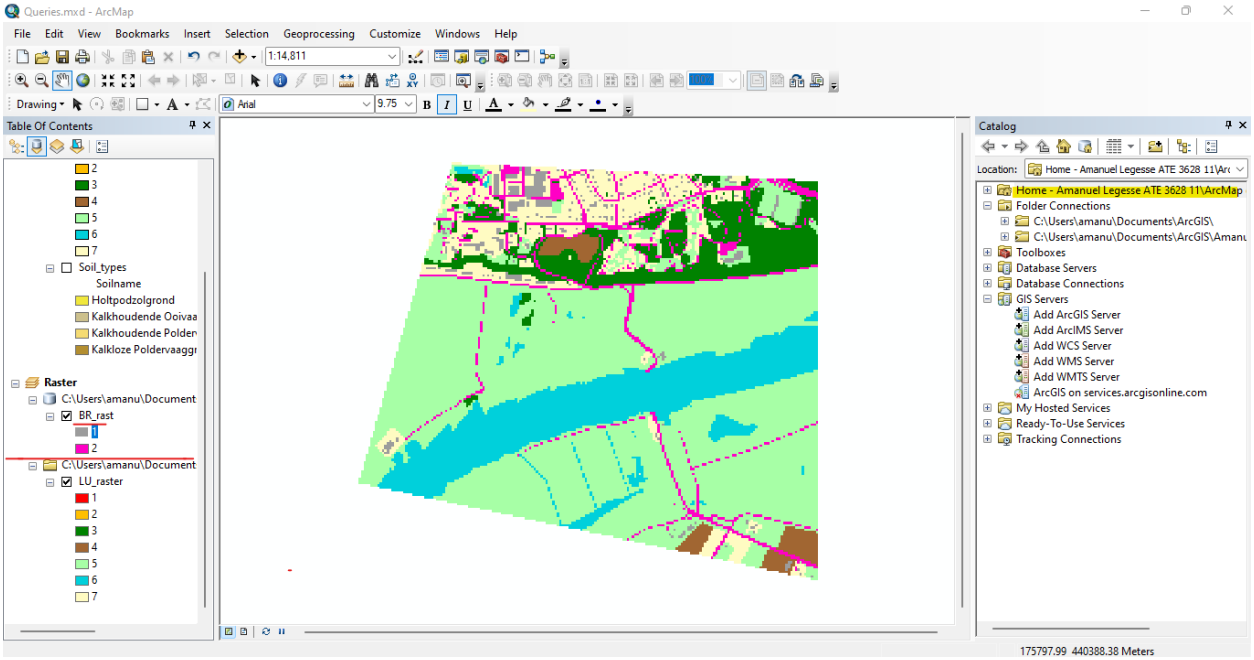
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My Hosted Services
Ready-To-Use Services
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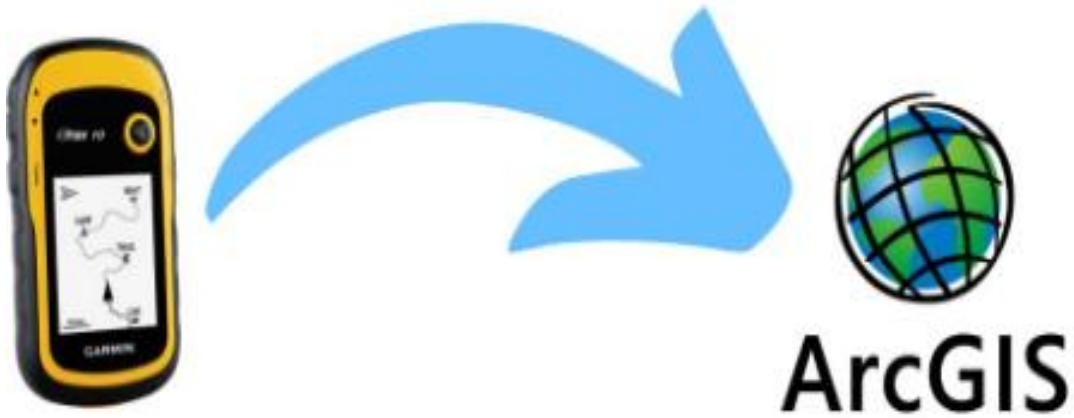
ARC-GIS

PROJECT:



AMANUEL LEGESSE

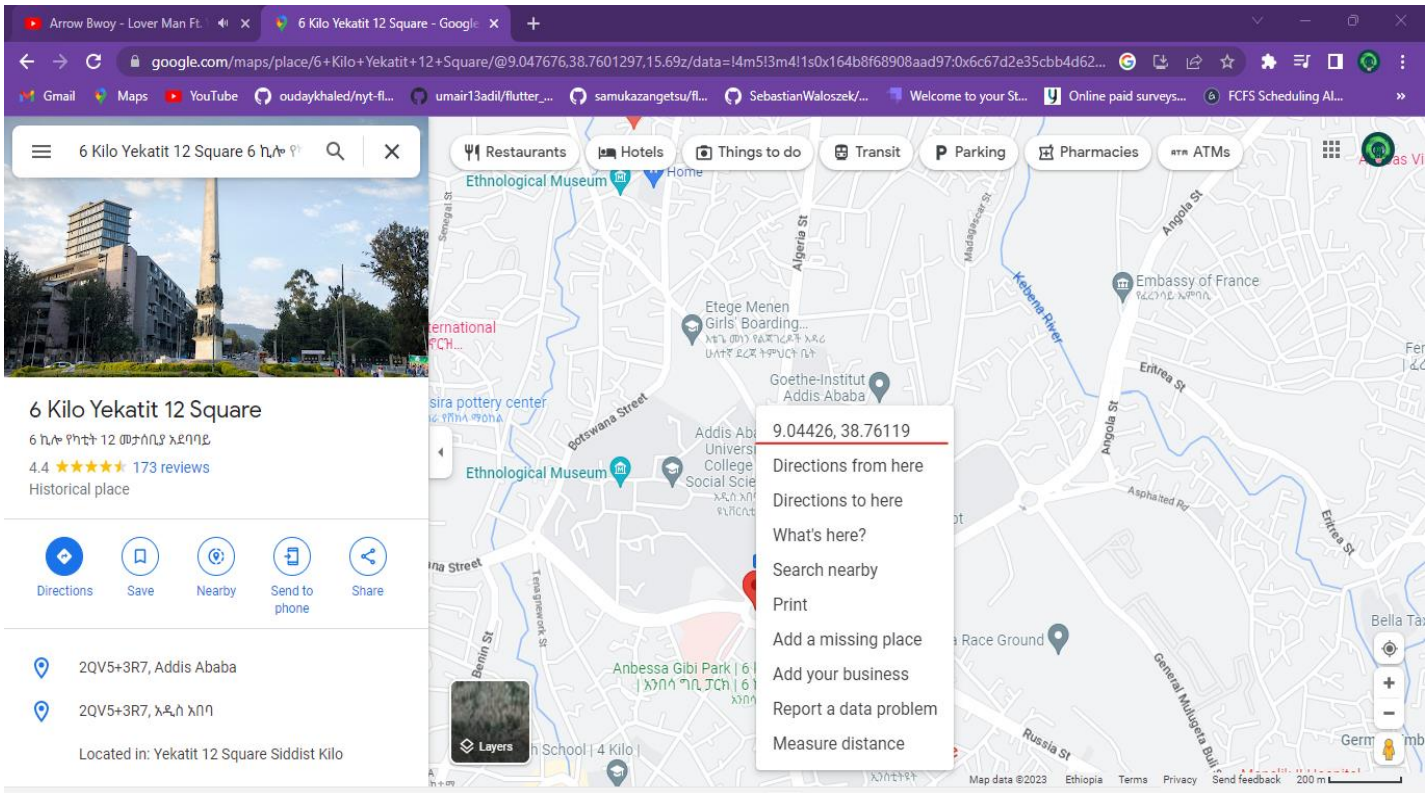
SOFTWARE ENG. EXT

ID – ATE/3628/11

POINT PROJECTION ON ARCMAP

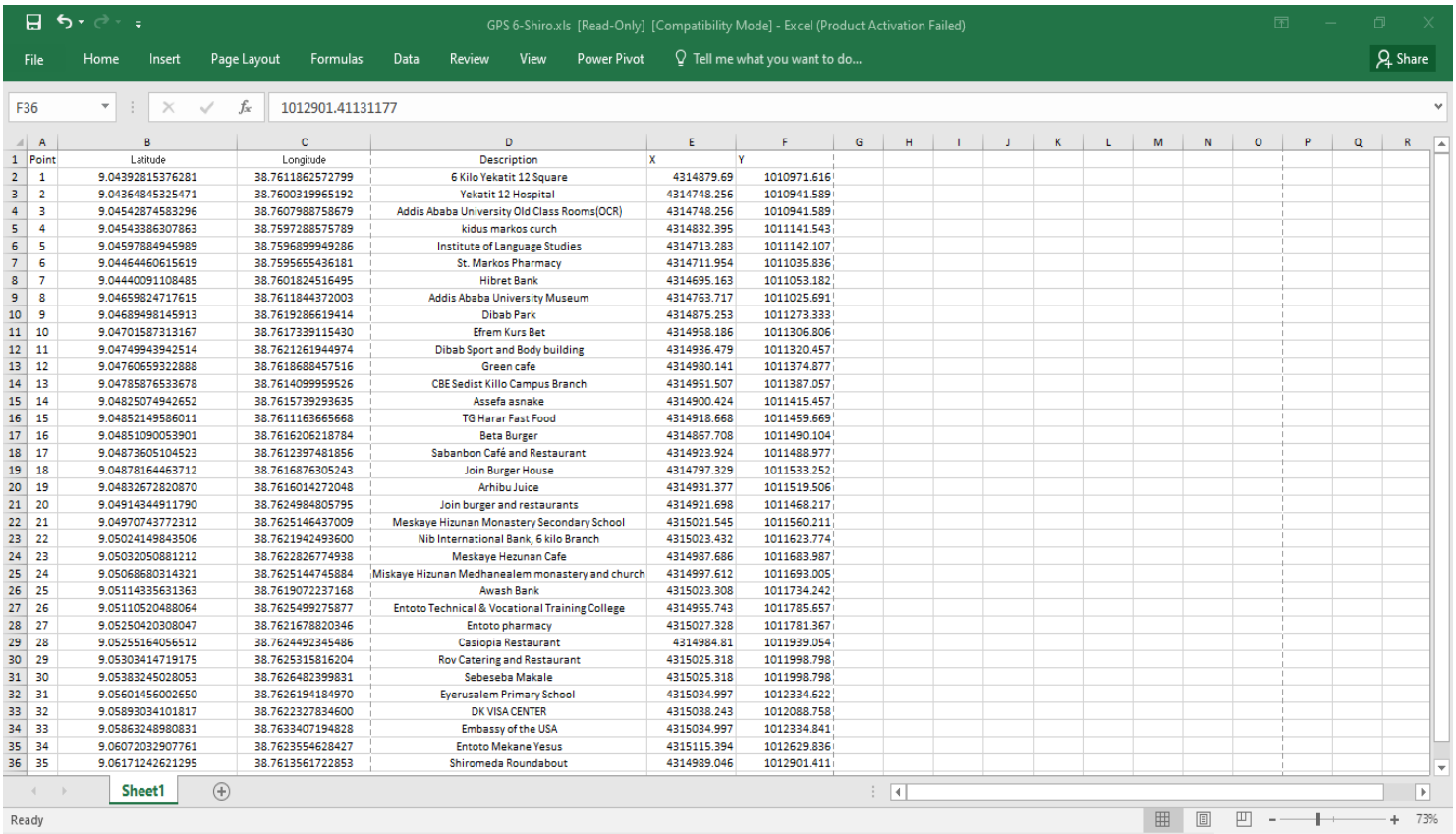
This assignment is briefly about collecting 35 points from a nearby location then projecting them on arcmap.

The location I have chosen for this project starts from 6kilo yekatit 12 square up to shiro-meda roundabout. The list of points choosen are as follows:



After going through the points on google map I gathered the latitude and longitude then converted them into X Y coardinate system.

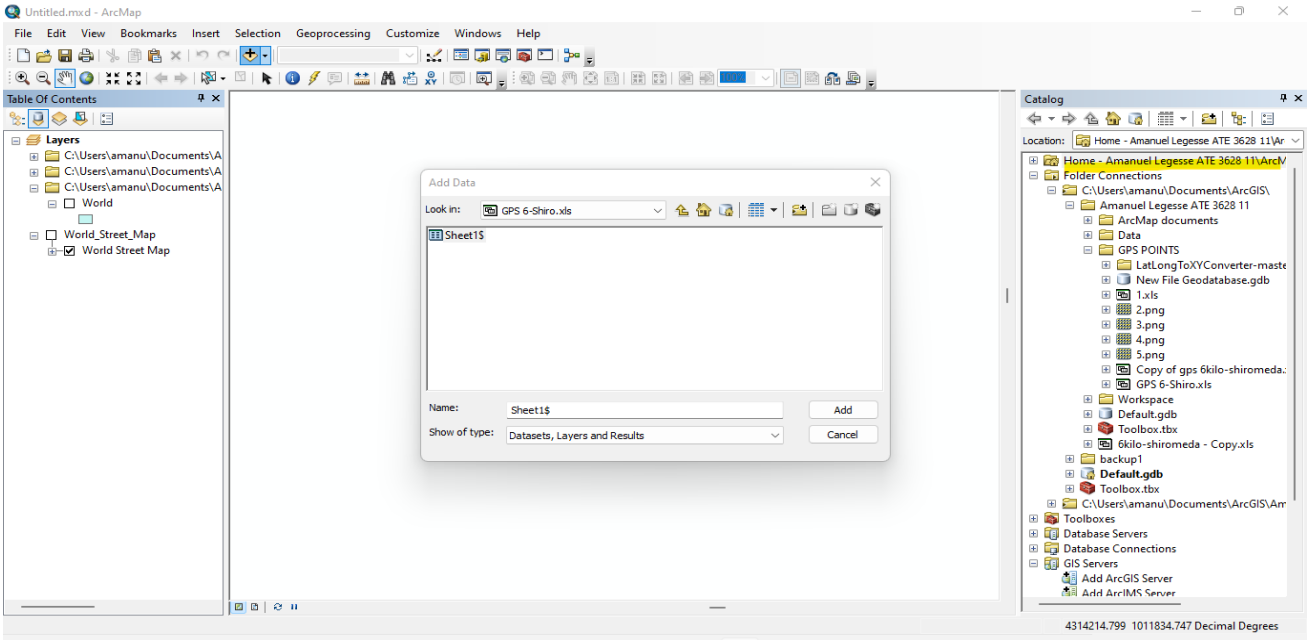
I gathered the data in excel form and saved the data sheet in .xls workbook form so arcmap can easily recognize the table.



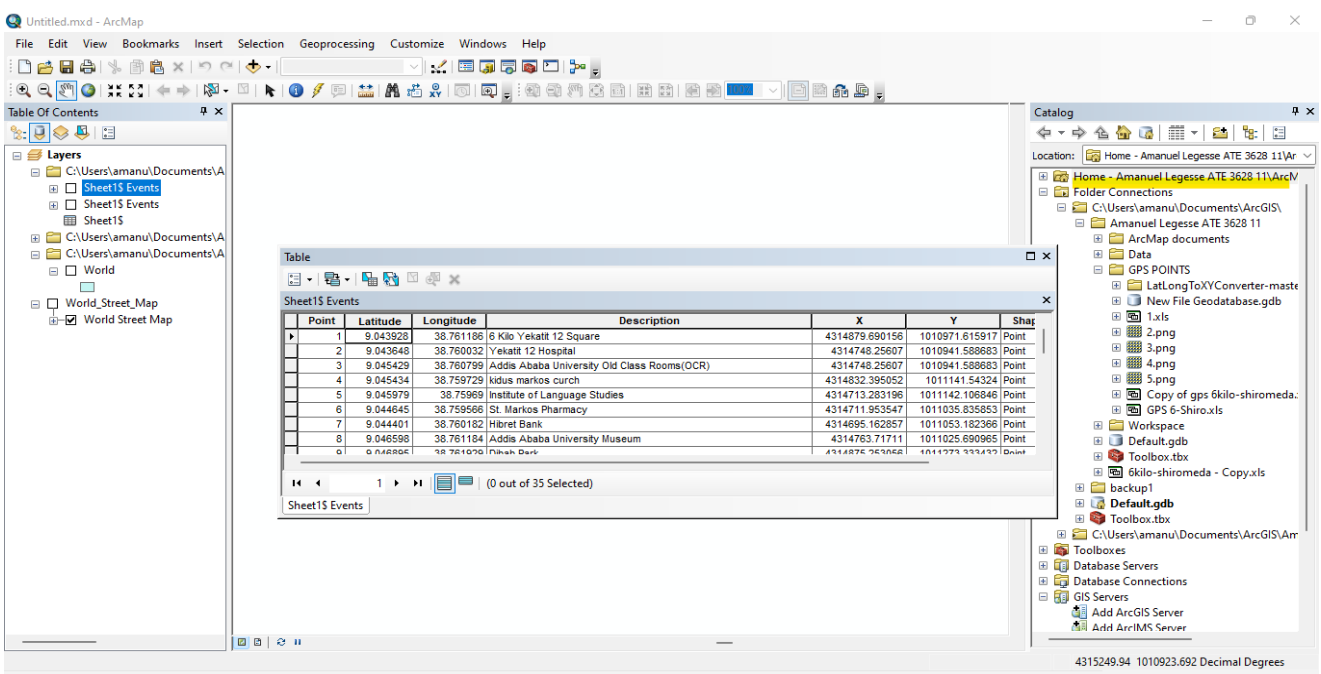
Point	Latitude	Longitude	Description	X	Y
1	9.04392815376281	38.7611862572799	6 Kilo Yekatit 12 Square	4314879.69	1010971.616
2	9.04364845325471	38.7600319965192	Yekatit 12 Hospital	4314748.256	1010941.589
3	9.04542874583296	38.7607988758679	Addis Ababa University Old Class Rooms(OCR)	4314748.256	1010941.589
4	9.04543386307863	38.7597288575789	kidus markos curch	4314832.395	1011141.543
5	9.04597884945989	38.7596899949286	Institute of Language Studies	4314713.283	1011142.107
6	9.04464460615619	38.7595655436181	St. Markos Pharmacy	4314711.954	1011035.836
7	9.04440091108485	38.7601824516495	Hibret Bank	4314695.163	1011053.182
8	9.04659824717615	38.7611844372003	Addis Ababa University Museum	4314763.717	1011025.691
9	9.04689498145913	38.7619286619414	Dibab Park	4314875.253	1011273.333
10	9.04701587313167	38.7617339115430	Efrem Kurs Bet	4314958.186	1011306.806
11	9.04749943942514	38.7621261944974	Dibab Sport and Body building	4314936.479	1011320.457
12	9.04760659322888	38.7618688457516	Green cafe	4314980.141	1011374.877
13	9.04785876533678	38.7614099959526	CBE Sedist Killo Campus Branch	4314951.507	1011387.057
14	9.04825074942652	38.7615739293635	Assefa asnake	4314900.424	1011415.457
15	9.04852149586011	38.7611163665668	TG Harar Fast Food	4314918.668	1011459.669
16	9.04851090053901	38.7616206218784	Beta Burger	4314867.708	1011490.104
17	9.04873605104523	38.7612397481856	Sabanbon Café and Restaurant	4314923.924	1011488.977
18	9.04878164463712	38.7616876305243	Join Burger House	4314797.329	1011533.252
19	9.04832672820870	38.7616014272048	Arhibu Juice	4314931.377	1011519.506
20	9.04914344911790	38.7624984805795	Join burger and restaurants	4314921.698	1011468.217
21	9.04970743772312	38.7625146437009	Meskaye Hizunan Monastery Secondary School	4315021.545	1011560.211
22	9.05024149843506	38.7621942493600	Nib International Bank, 6 kilo Branch	4315023.432	1011623.774
23	9.05032050881212	38.7622826774938	Meskaye Hezunan Cafe	4314987.686	1011683.987
24	9.05068680314321	38.7625144745884	Miskaye Hizunan Medhanealem monastery and church	4314997.612	1011693.005
25	9.05114335631363	38.7619072237168	Awash Bank	4315023.308	1011734.242
26	9.05110520488064	38.7625499275877	Entoto Technical & Vocational Training College	4314955.743	1011785.657
27	9.05250420308047	38.7621678820346	Entoto pharmacy	4315027.328	1011781.367
28	9.05255164056512	38.7624492345486	Casiopia Restaurant	4314984.81	1011939.054
29	9.05303414719175	38.7625315816204	Rov Catering and Restaurant	4315025.318	1011998.798
30	9.05383245028053	38.7626482399831	Sebeseba Makale	4315025.318	1011998.798
31	9.05601456002650	38.7626194184970	Eyerusalem Primary School	4315034.997	1012334.622
32	9.05893034101817	38.7622327834600	DK VISA CENTER	4315038.243	1012088.758
33	9.05863248980831	38.7633407194828	Embassy of the USA	4315034.997	1012334.841
34	9.06072032907761	38.7623554628427	Entoto Mekane Yesus	4315115.394	1012629.836
35	9.06171242621295	38.7613561722853	Shiromeda Roundabout	4314989.046	1012901.411

- The excel file can be found in this project folder.

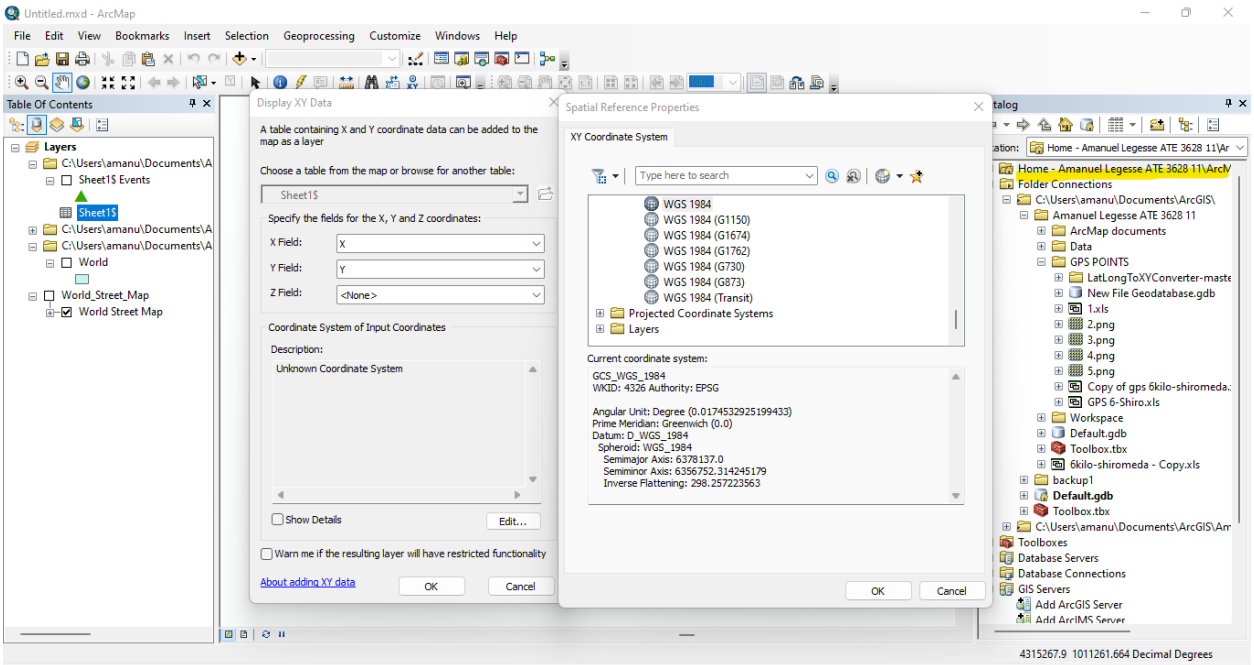
By adding my excel data arcmap was able to detect the data sheets.



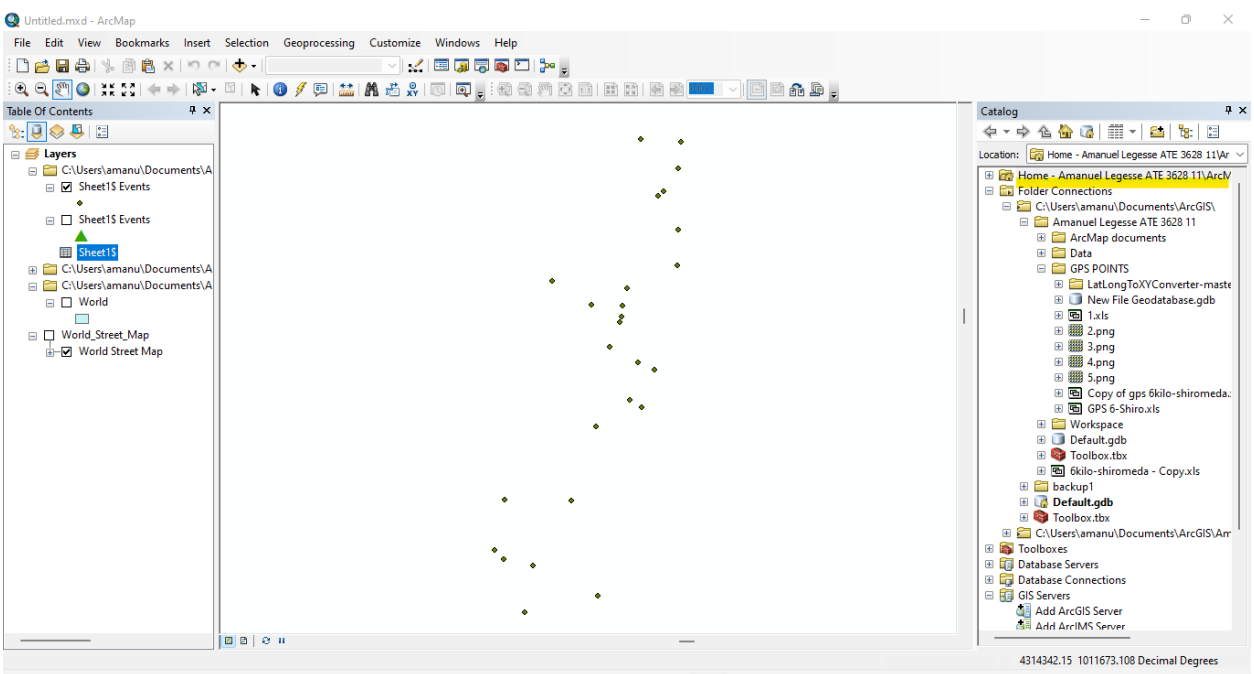
To make sure all the data are present I previewed the sheets in table form.



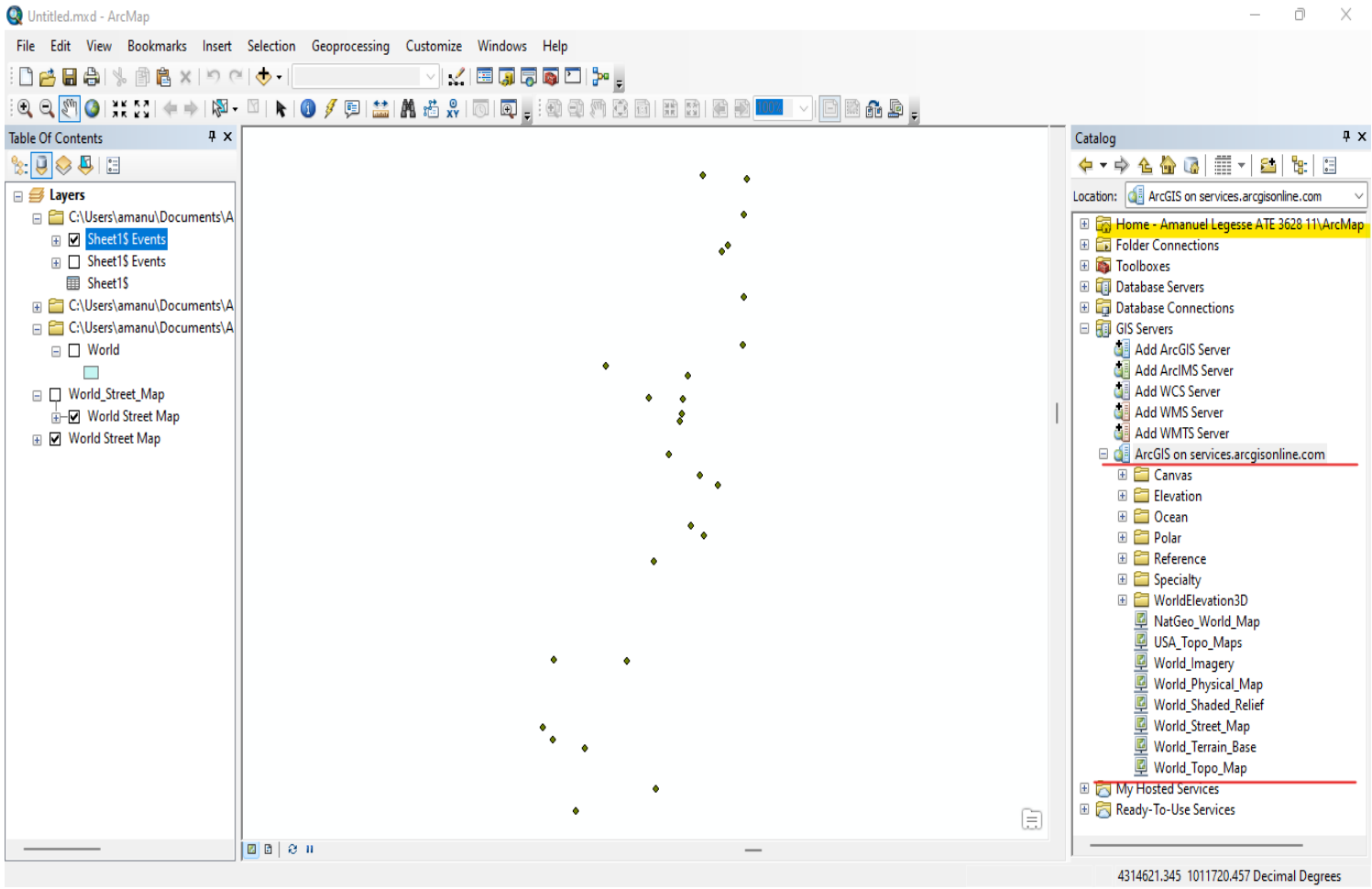
To preview my data sheet I selected the display XY data and gave the XY coaordinates of the points then chose GCS_WGS_1984 as the coordinate system.



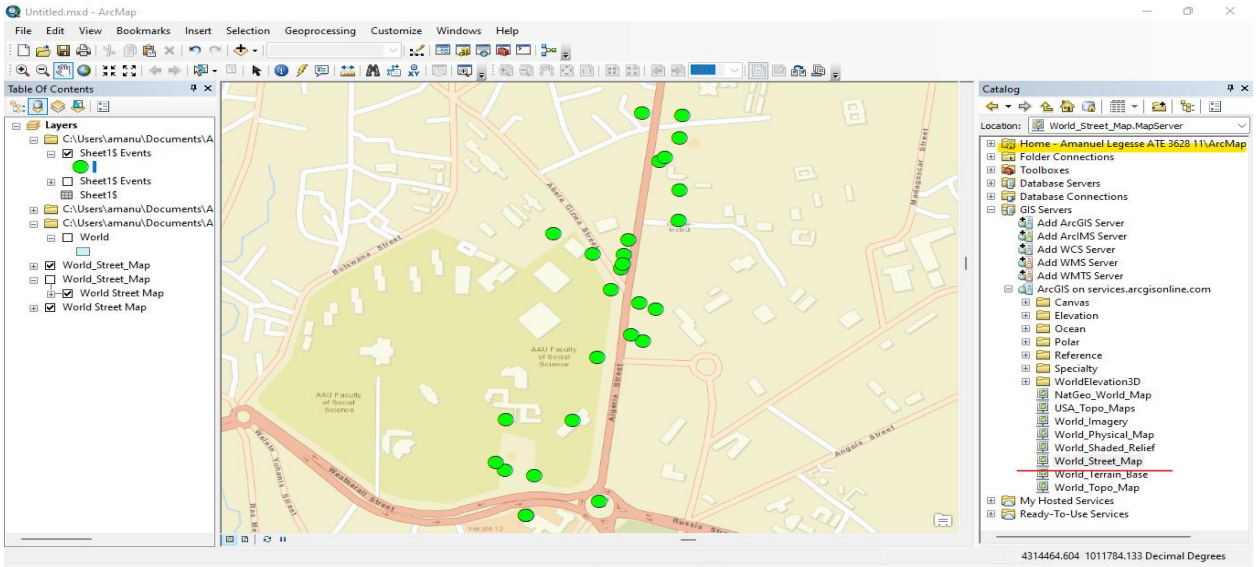
- The points are then visible as shown:



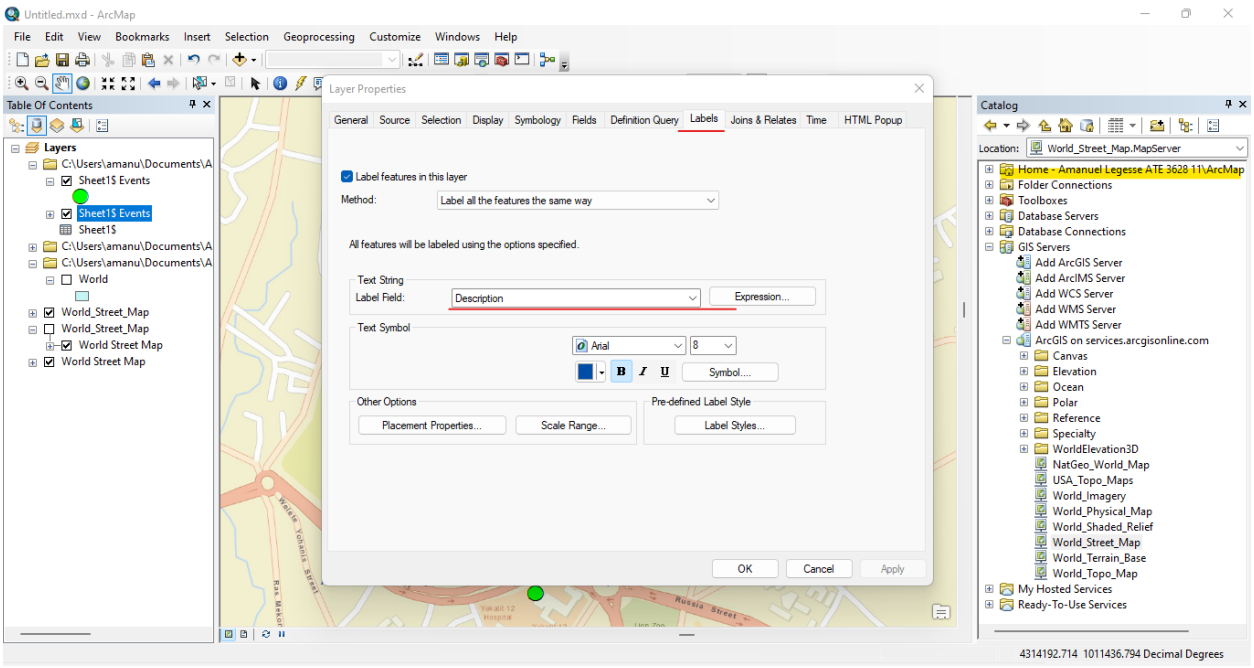
The next step would be adding the world map to display the gathered points on it yet adding basemap by accessing arcgis online services I was able to fetch map data from their website.

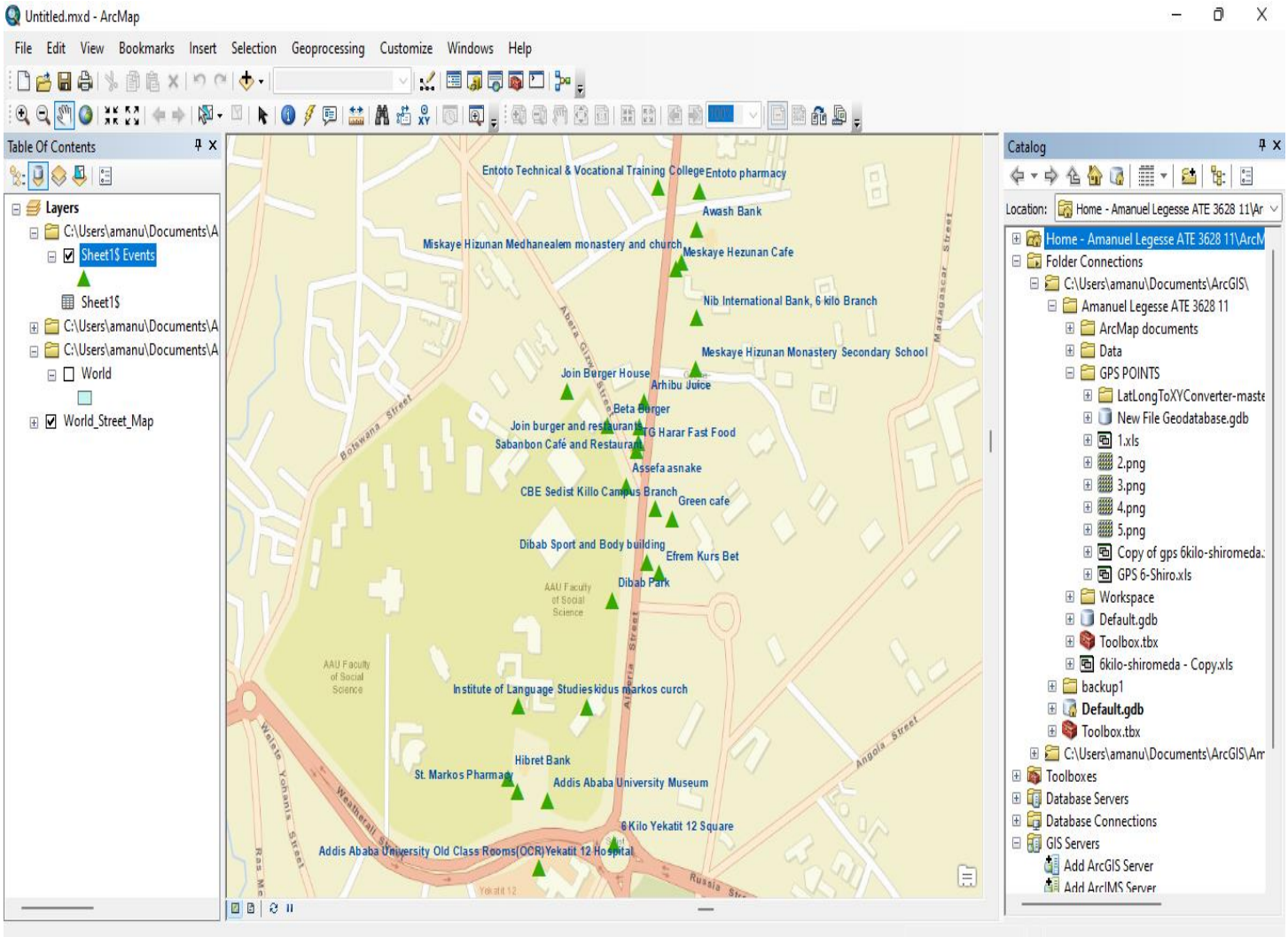


Activating the world street map results in the following map projection.



To make things clear I labeled my points with description that was already provided in the table.





- ✓ As a conclusion, using the above steps I was able to display 35 points from my neighborhood to arcmap using XY coordinate system and by the use of arcgis services a street map was used to make sure my points are in the right coordinate system.