CIVIL AND ENVIRONMENTAL ENGINEERING

CEE 5190/6190: GIS for Civil Engineers

Instructor: Jeffery Horsburgh

Assignment 2

Vector vs. Raster Data and Geodatabase vs. Shapefile

Submitted by
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1.

i. The shape file HUC 10 level was added from the **WB_HU10** feature class in the **WBD** feature dataset. and the shapefile was projected into the requested coordinate system using “project” function in the toolbox.

ii. Logan river was extracted and the symbology chosen was 100% percent transparency inside the area and light blue in the boundary line. A basemap was added in the background. The screen shot of the Logan River watershed is presented in fig 1 below;

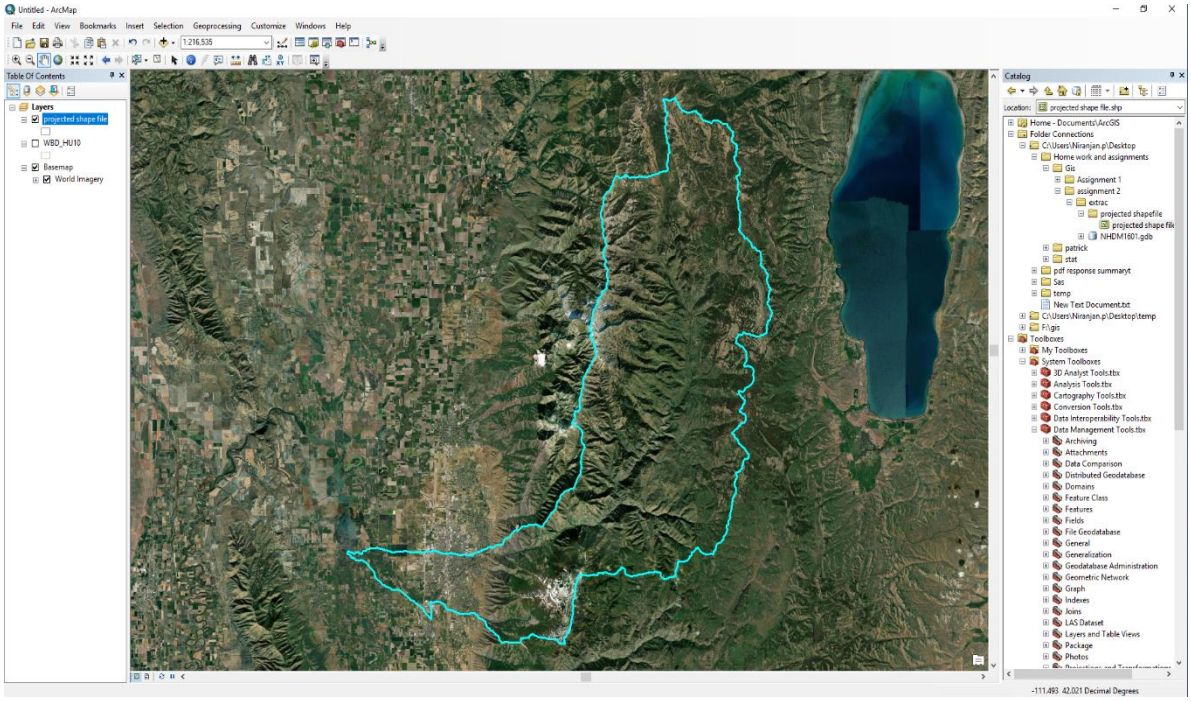

Fig1: Logan river watershed with newly projected and modified Shapefile.

2.

i. Three features classes, ***NHDFlowline, NHDWaterbody and HYDRO_NET_Junctions*** were added to the map. Now by using the “Select by Location” feature of ArcMap, the NHD features which intersect with the Logan River Watershed were selected and were extracted one by one into a new shapefiles.

ii. The new shape files were all projected into the designated coordinate system (NAD 1983 StatePlane Utah North FIPS 4310(Meters)), the symbology were provided. The flowlines were designated dark blue, hydraulic junctions were represented with black triangles as shown in fig 2. Some of the lines can be seen leaving the Logan River watershed, these lines represent the flowline which intersect the boundary at the origin or somewhere along the line.

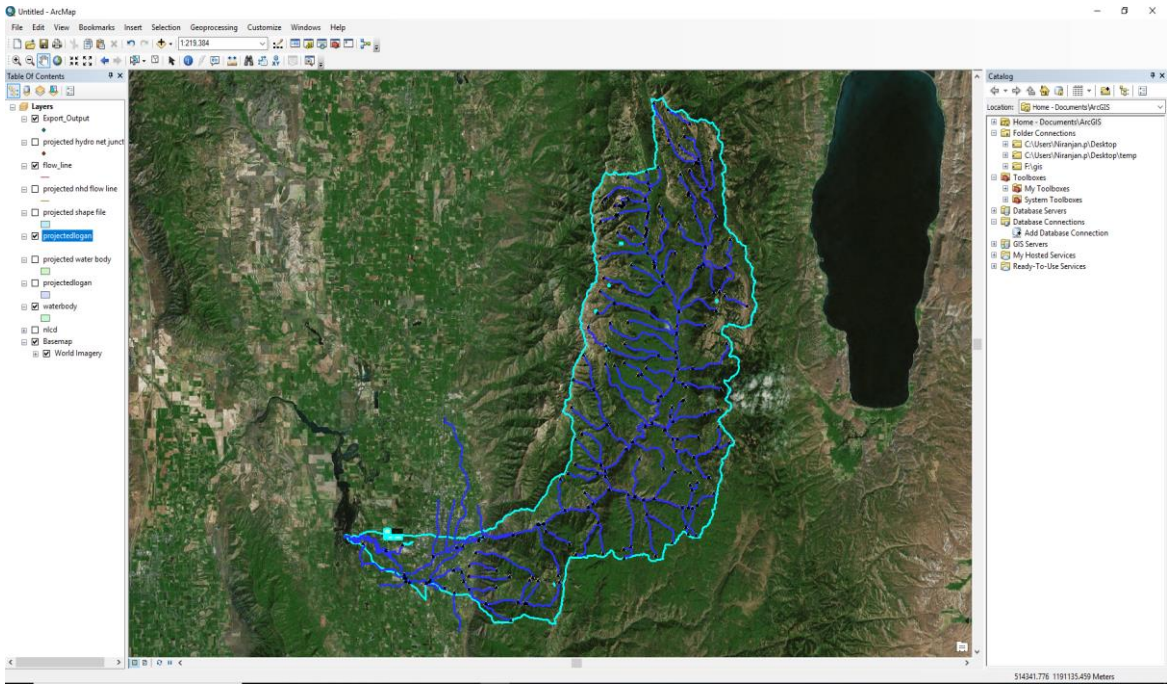

Fig 2: ArcMap window showing basemap, watershed boundary, extracted flowline, waterbody and junctions.

3.

i. The provided webpage was visited and from MRLC Consortium Viewer, the map was zoomed to the area showing Logan River Watershed. Then the download area was adjusted to cover entire Logan River Watershed area. The NLCD data was downloaded from the link in email.

ii. The downloaded dataset was projected to NAD 1983 StatePlane Utah North FIPS 4310(Meters) using “Project Raster” in the toolbox and was used as a basemap for future use. The screen shot of the “Layer properties” window of the landcover is shown below in fig 3.

iii. The screenshot of the watershed boundary showing the flowlines, waterbodies, junctions along with land cover dataset is shown below in fig 4.

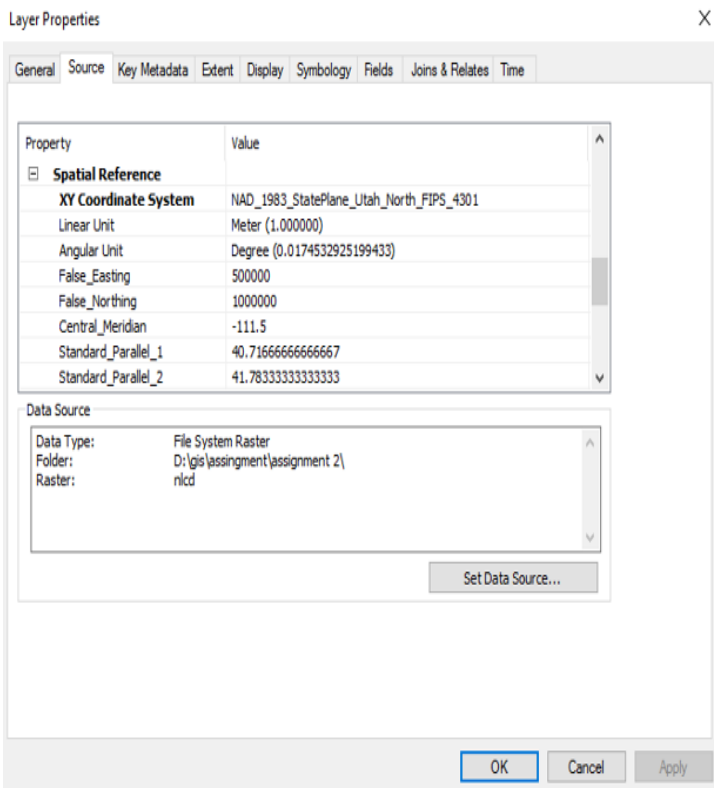

Fig 3: Layer properties window.

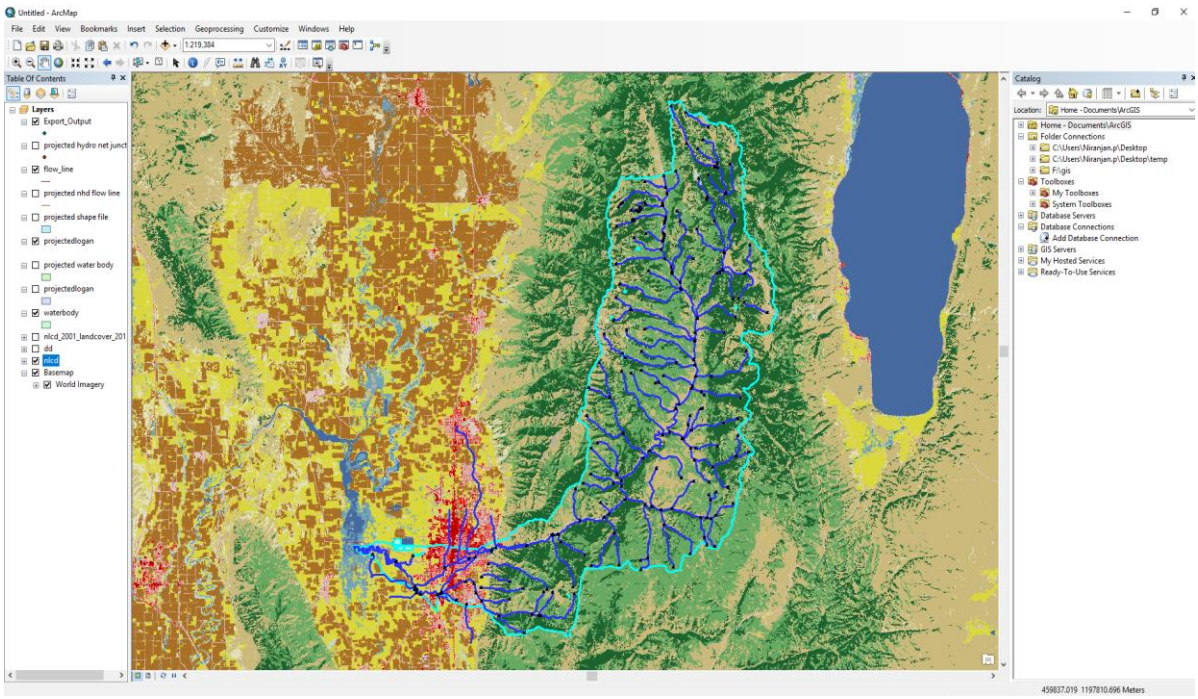

Fig4: Logan river watershed showing landcover dataset with flowlines, waterbodies and junctions

4.

i. Using “Tabulate Area” function from Arc Toolbox from mentioned path and combining with the legend from the NLCD from the excel sheet downloaded the following is the table showing Land Cover Class Number, Land Cover Class Name, area in square meter and square kilometer. Area in square kilometer is rounded to third decimal place.

Row ID	Land Cover class	Land Cover Class Name	Area(m^2)	Area(km^2)
1	11	Open Water	1068300	1.068
2	21	Developed, Open Space	10484100	10.484
3	22	Developed, Low Intensity	10591200	10.591
4	23	Developed, Medium Intensity	6219000	6.219
5	24	Developed, High Intensity	2019600	2.020
6	31	Barren Land	2997900	2.998
7	41	Deciduous Forest	205264800	205.265
8	42	Evergreen Forest	205516800	205.517
9	43	Mixed Forest	19443600	19.444
10	52	Shrub/Scrub	158493600	158.494
11	71	Herbaceuous	1734300	1.734
12	81	Hay/Pasture	14761800	14.762
13	82	Cultivated Crops	2743200	2.743
14	90	Woody Wetlands	3579300	3.579
15	95	Emergent Herbaceuous Wetlands	1670400	1.670

Table 1: Land Cover Class Name and their areas.

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Grading Rubric

Item	Standard	Points Available	Points Awarded
Formatting	Submission conforms to formatting requirements in the Syllabus, including title page.	5	
1	Screenshot of extracted Logan River watershed with basemap in the background	20	
2	Screenshot of map of extracted NHD datasets including the ***NHDFlowline***, ***NHDWaterbody***, and the ***HYDRO_NET_Junctions***.	25	
3	Screenshot of map of layer properties for projected land cover dataset and screen shot of map showing land cover, watershed boundary, flowlines, and junctions.	25	
4	Land cover summary table for the Logan River watershed with appropriate table caption and columns for land cover class, land cover class name, area in square meters, and area in square kilometers.	25	
Total		100	