



CEE 5190/6190: GIS for Civil Engineers

Instructor: Jeffery Horsburgh

Assignment 3 **Building a geodatabase**

Submitted by
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- 1) A new geo database was created and it was named assignment 3 and as per the instruction the metadata was edited and appropriate title, credit and descriptions were added. Screen shot of the window showing title, Description and Credits is shown in fig 1

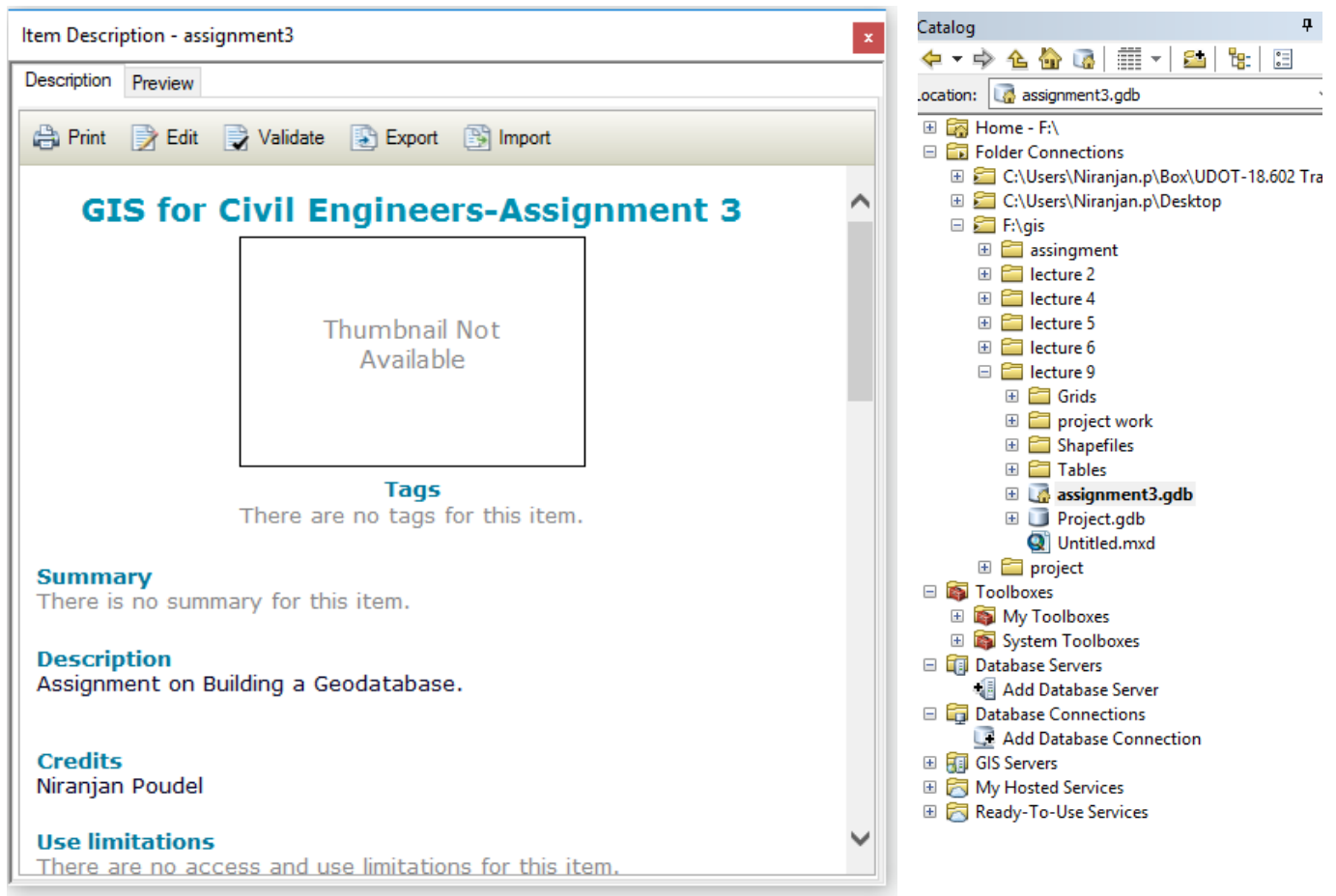


Fig 1: Title, Description and Credits for new geo data base

- 2)
 - i. Three new feature datasets with names Hydrology, Monitoring and Political were added to the geodatabase, each of the datasets were assigned to **NAD 1983 UTM Zone 12N** spatial reference system and **NAVD 1988** for the vertical coordinate system. Screenshot of XY coordinate system and z coordinate system is shown below in fig 2 and 3.
 - ii. Shapefiles "streams.shp", and "watershed.shp" were imported to Hydrology feature dataset, "water_quality_stations.shp" and "streamflow_gages.shp" were imported to monitoring feature dataset and "utah.shp" was imported to Political dataset. Proper symbology was provided and the watershed was set to 100% transparency and Utah was set to 60% transparency. Fig 4 shows the screen shot to the extents of watershed layer.

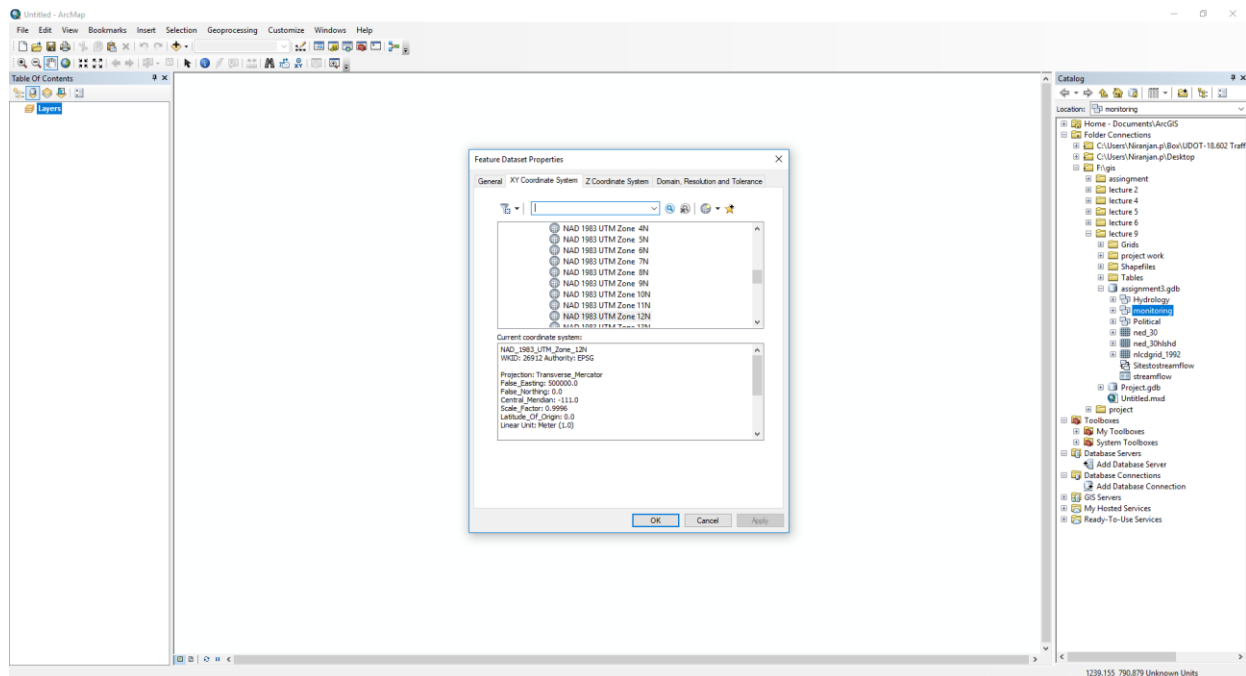


Fig 2: XY coordinate system of monitoring feature dataset.

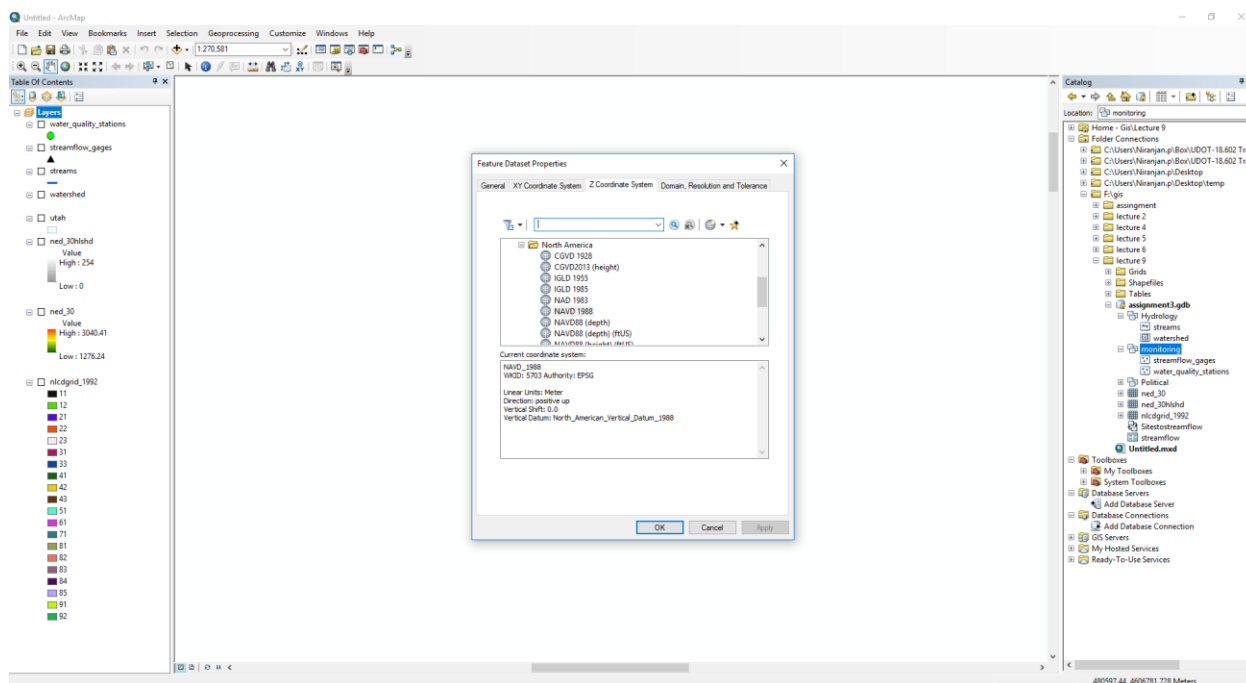


Fig4: Z coordinate system of monitoring feature dataset.

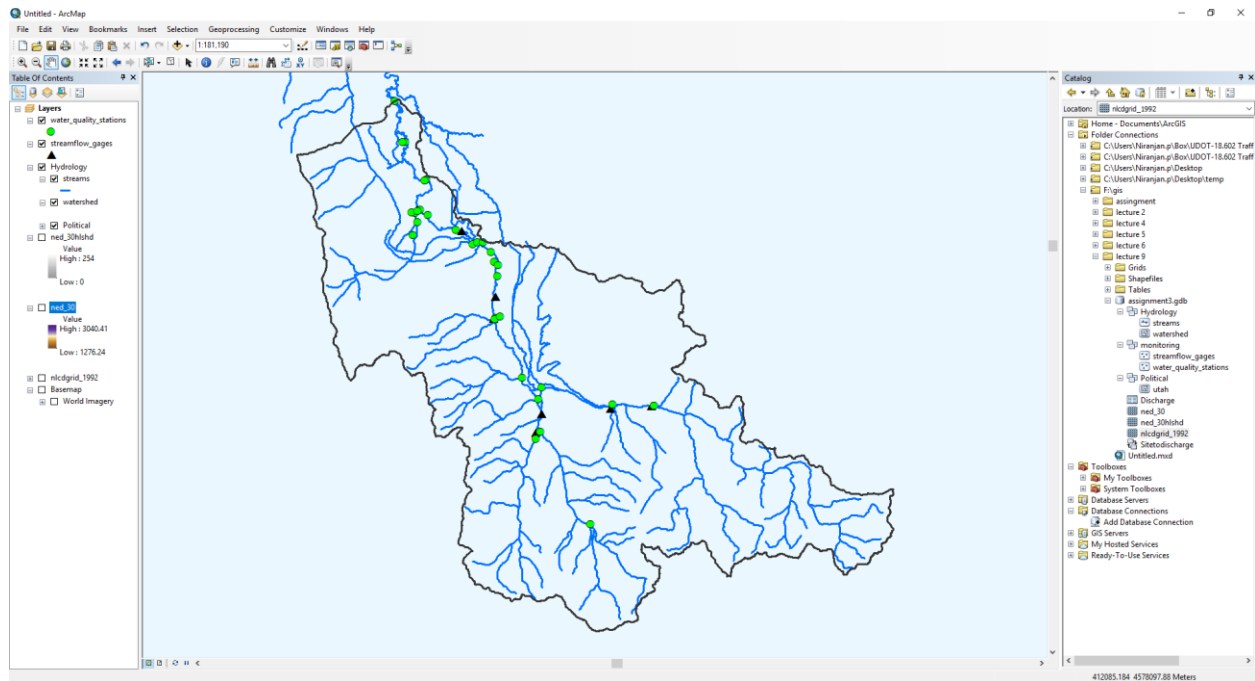


Fig 4: Watershed layer, arc catalog showing geodatabase, datasets and feature classes

- 3) Raster datasets provided were imported to the geodatabase and added to the map. The symbology and transparency were provided as suggested. “Ned_hlshd” was moved above “ned_30” layer. Fig 5 shows screenshot of the ArcMap to the extent of watershed and arc catalog is also shown in the fig.

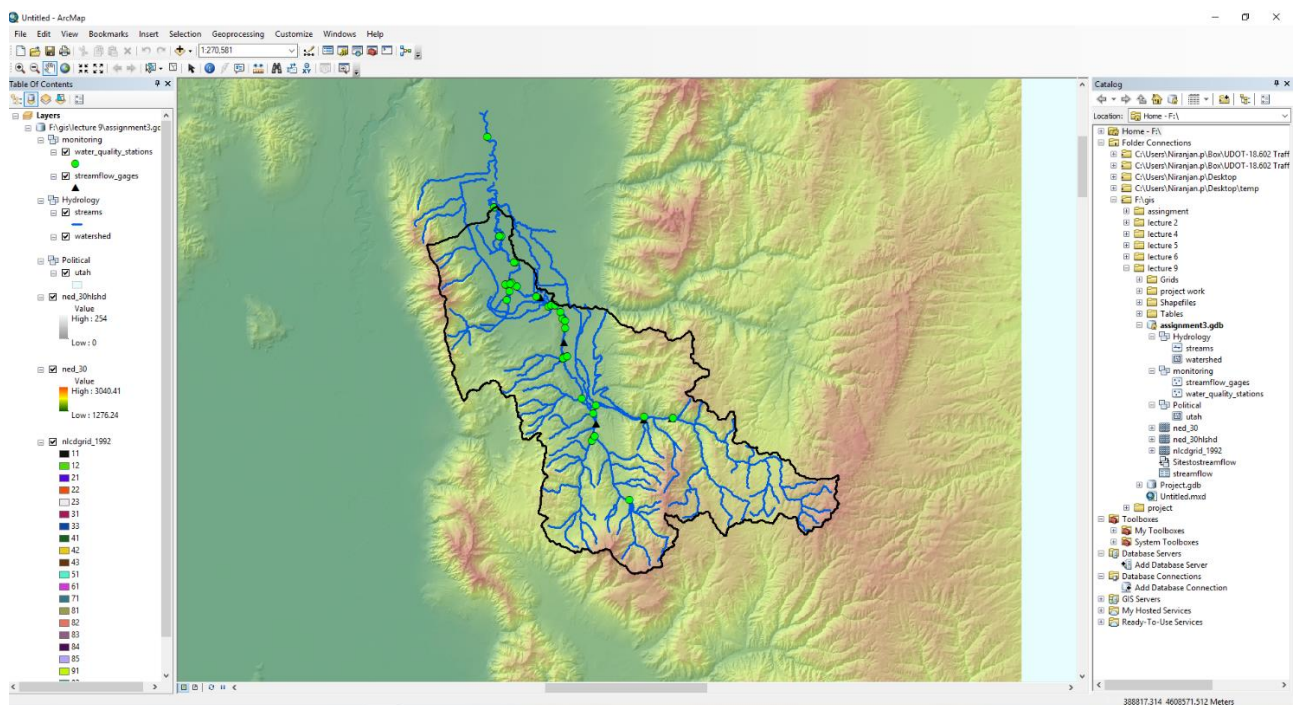


Fig 5: Raster datasets and arc catalog

4)

- i. Table "LBR_discharge.csv" was imported to the geodatabase, SiteCode attribute in the field map was set to "Text" with a length of 50 and added to the map. The table showing more than 20 rows of data in the table is shown below in Table 1.

OBJECTID *	AgencyCode	SiteCode	Date	DischargeCFS	CommentCode
1	USGS	10104600	7/1/1966	13	A
2	USGS	10104600	7/2/1966	13	A
3	USGS	10104600	7/3/1966	13	A
4	USGS	10104600	7/4/1966	13	A
5	USGS	10104600	7/5/1966	13	A
6	USGS	10104600	7/6/1966	13	A
7	USGS	10104600	7/7/1966	12	A
8	USGS	10104600	7/8/1966	12	A
9	USGS	10104600	7/9/1966	12	A
10	USGS	10104600	7/10/1966	12	A
11	USGS	10104600	7/11/1966	12	A
12	USGS	10104600	7/12/1966	12	A
13	USGS	10104600	7/13/1966	12	A
14	USGS	10104600	7/14/1966	12	A
15	USGS	10104600	7/15/1966	12	A
16	USGS	10104600	7/16/1966	11	A
17	USGS	10104600	7/17/1966	11	A
18	USGS	10104600	7/18/1966	11	A
19	USGS	10104600	7/19/1966	11	A
20	USGS	10104600	7/20/1966	11	A
21	USGS	10104600	7/21/1966	11	A
22	USGS	10104600	7/22/1966	11	A
23	USGS	10104600	7/23/1966	11	A
24	USGS	10104600	7/24/1966	11	A
25	USGS	10104600	7/25/1966	11	A
26	USGS	10104600	7/26/1966	11	A
27	USGS	10104600	7/27/1966	11	A
28	USGS	10104600	7/28/1966	11	A
29	USGS	10104600	7/29/1966	10	A

Table 1: Table(streamflow) imported from the given file.

- ii. One to many relationship class was created inside geodatabase called **SitesToStreamflow** relating the Station field in the attribute table of **streamflow_gages** feature class and the **SiteCode** field in the **streamflow** table, composite relationship and both was selected for the message propagation direction. The screen shot of the General tab of properties dialog is shown in the fig 6.

Relationship Class Properties

General Rules

Name: Sitestostreamflow

Type: Composite

Cardinality: 1 - M

Notification: Both

Origin Table/Feature Class

Name: streamflow_gages

Primary Key: STATION

Foreign Key: SiteCode

Destination Table/Feature Class

Name: streamflow

Labels

Forward: streamflow

Backward: streamflow_gages

OK Cancel Apply

Fig 6: General properties of relationship class

- iii. From the attribute table of stream_flow gages, row with Station = 10105900 was selected, and related streamflow table was opened. Screenshot of statistical summary from DischargeCFS is shown below in fig 7.

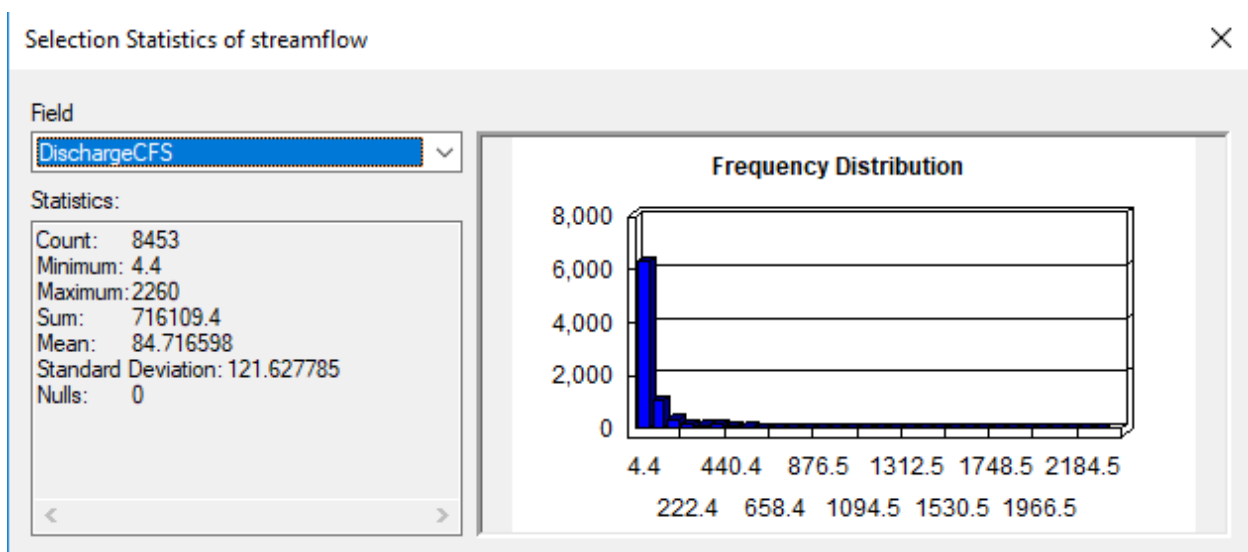


Fig 7: Statistical summary of the selected streamflow records.

- 5)
- i A new file geo database was created and named as Project inside the project folder. One feature dataset was created named Adamsneighborhood. Our project focuses on the reduction of time and cost for the collection of recyclable solid wastes in Adams Neighborhood. NAD 1983 UTM ZONE 12N coordinate system was selected for XY coordinate system and NAD 1988 for Z coordinate system. We selected these coordinate systems to reduce the distortion because our project is in Logan city which falls in Utah state. These coordinate systems also use metric system which will be easy for us to understand the calculations.
 - ii Two shapefiles were downloaded from the web address “www.arcgis.com/home.” containing the information of the road network in Logan and the information of all the buildings in the Logan city. As mentioned earlier these data are required in our project for the route assessment, to calculate travel time and to locate the position of the houses in the neighborhood. As these were imported in the feature dataset with name “buildings” and “road network”, already in a coordinate system there was no need to convert into the coordinate system. The screenshot in fig 8 shows the expanded tree view of the geodatabase with feature dataset and the feature classes.

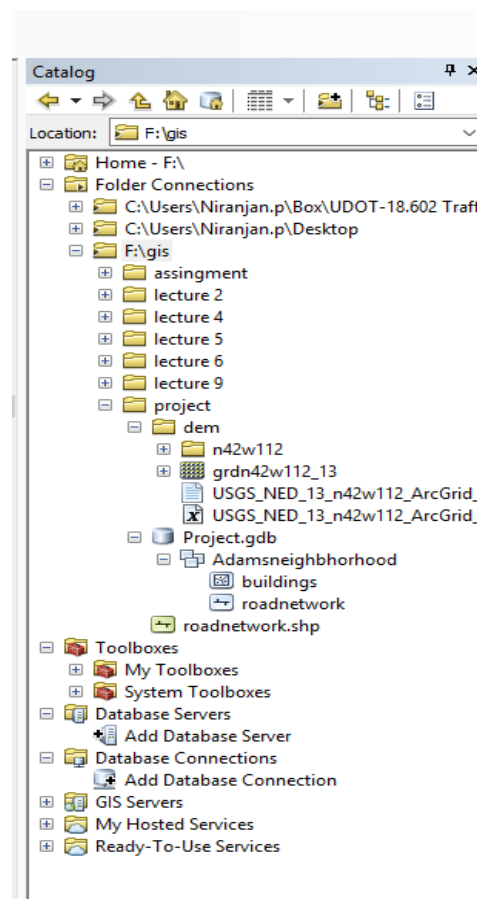


Fig 8: Expanded tree view of the geodatabase with feature dataset and the feature classes.

- iii The feature class were added to a new map. The buildings were given the blue color symbology and the road network were given red color symbology. Digital elevation model 1/3 arc second (approximately 10-meter resolution) was downloaded from the provided webpage. The DEM was added to the map and 60% transparency was given. There is no much elevation difference in the Adams neighborhood so there is not much change in color. The screen shot somewhat to the extent of Adams neighborhood is shown in the following screenshot.



Fig 9: Feature class and DEM raster set Arc Map window.

CEE 5190 / 6190
Assignment 3. Building a Geodatabase

Item	Standard	Points Available	Points Awarded
Formatting	Submission conforms to formatting requirements in the Syllabus, including title page.	5	
1	Screenshot of item description dialog with correct title and name in the credits	5	
2	<ul style="list-style-type: none"> • Dialog showing correct coordinate system for Hydrology feature dataset (5). • Map with all feature classes in the Hydrology and Monitoring feature datasets visible. The Catalog window must be visible with the feature datasets expanded to show their contents (15). 	20	
3	Screen shot must show map including the DEM with shaded relief provided by the hillshade and the correct vector layers. The catalog window must show all layers successfully added to the geodatabase.	25	
4	<ul style="list-style-type: none"> • Screen shot of streamflow table must show at least the first 20 records of streamflow data (10) • Must include screenshot of relationship class properties (5) • Screen shot of discharge summary for Station 10105900 must be correct. (10) 	25	
5	<ul style="list-style-type: none"> • Clear, written description of the coordinate system chosen for your geodatabase/feature dataset. (5) • Clear written descriptions of the two datasets you obtained and loaded into your geodatabase (5) • Map showing the two vector datasets on top of the NED DEM. Catalog window must be visible showing the new geodatabase, feature dataset, feature classes, and raster dataset (DEM) (10) 	20	
Total		100	