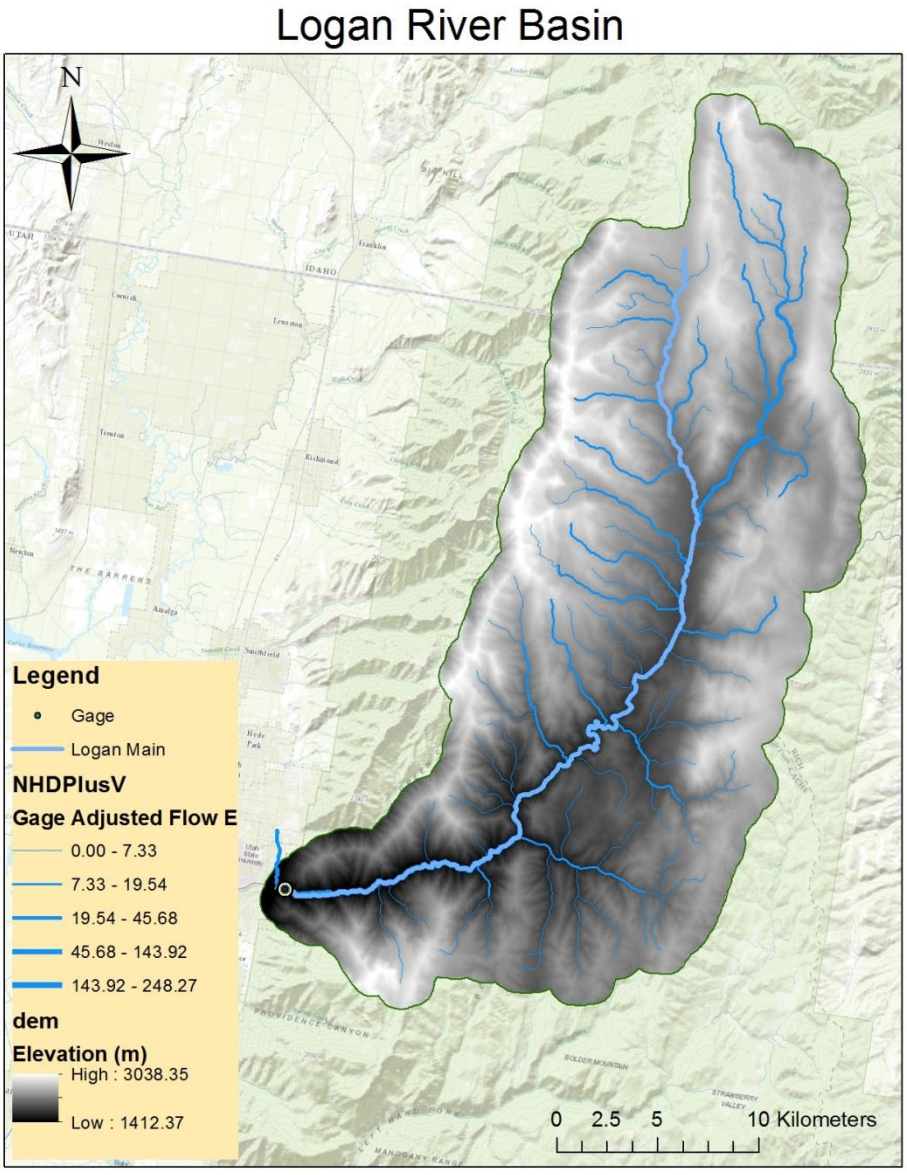
GIS in Water Resources Exercise 4 Solution

1)

Logan River Basin Medium Resolution				
Main Stream Length (m)	Total Stream Length (m)	Basin Area (m^2)	Drainage Density (m/m^2)	Ave. Overland flow distance (m)
53,109.68	388,384	555380000	0.00070	715.0

Logan River Basin High Resolution			
Total Stream Length (m)	Basin Area (m^2)	Drainage Density (m/m^2)	Ave. Overland flow distance (m)
636,461	555380000	0.0011	436.3

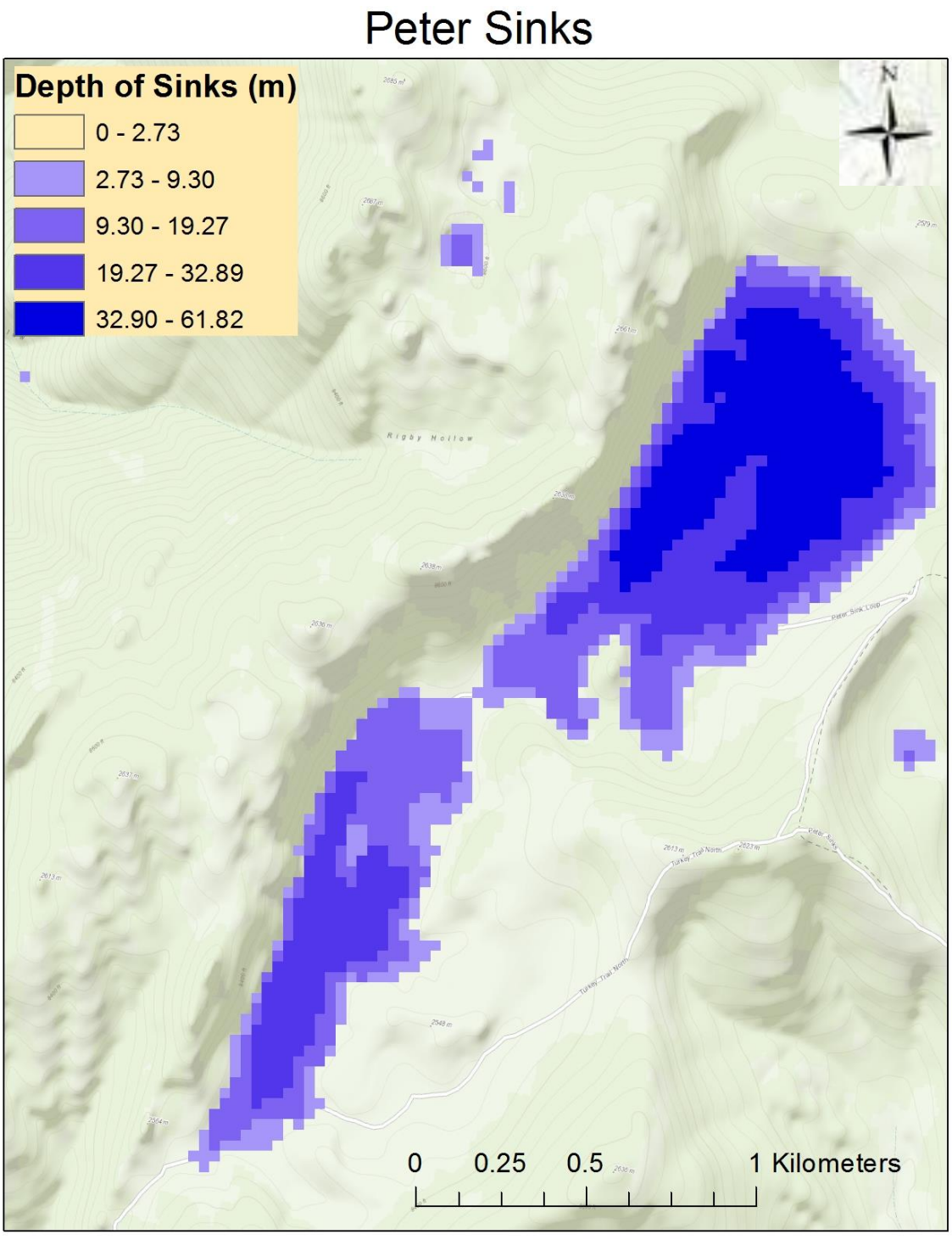
2)



3)

Number of Columns	Number of Rows	Grid Cell Size (km^2)	Minimum Elevation (m)	Maximum Elevation (m)
968	1466	956.17	1412.37	3038.35

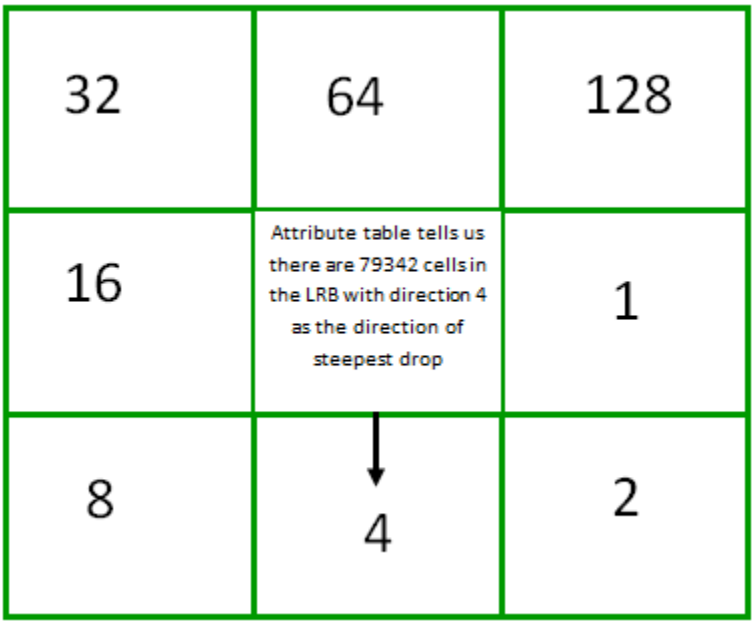
4) Deepest sink = 61.82 m deep



5) Flow Direction Attribute Table

fdr

OBJECTID *	Value	Count
1	1	120985
2	2	89373
3	4	94913
4	8	79342
5	16	112640
6	32	74308
7	64	71722
8	128	79821

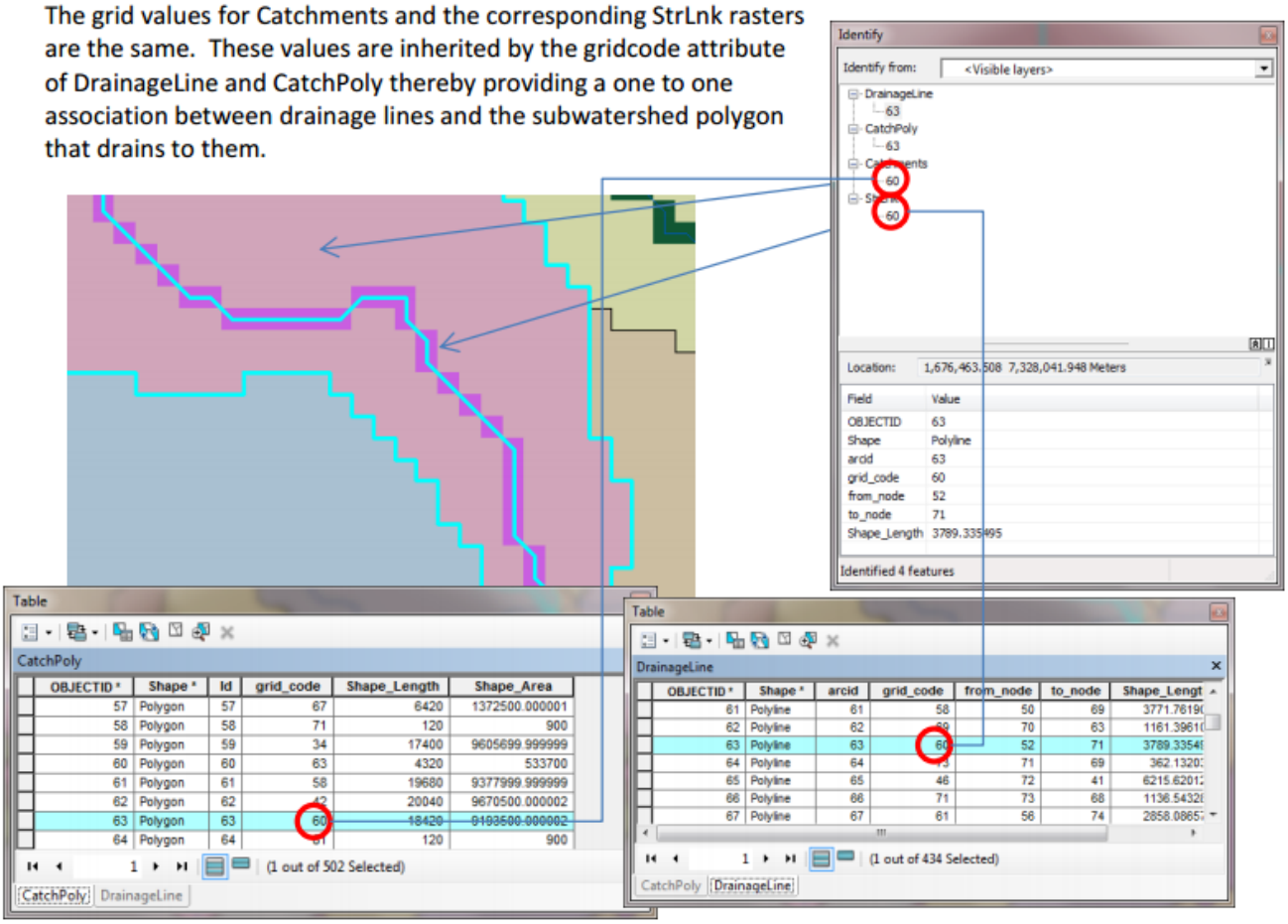


6)

DA Number of cells	Area (km^2)	USGS DA (miles^2)	USGS DA (km^2)
583856	558.19	214	554.26

7)

The grid values for Catchments and the corresponding StrLnk rasters are the same. These values are inherited by the gridcode attribute of DrainageLine and CatchPoly thereby providing a one to one association between drainage lines and the subwatershed polygon that drains to them.



8)

Right Hand Fork						
Total Length (km)	Number of Stream Links	Distance from junction to outlet (km)	Total Length of upstream links (km)	total upstream area (km^2)	drainage density (length /area) (km^-1)	number of downstream links on path to outlet
20216.81	13	14.5	20.2	65.8	0.3	3

Franklin Basin						
Total Length (km)	Number of Stream Links	Distance from junction to outlet (km)	Total Length of upstream links (km)	total upstream area (km^2)	drainage density (length /area)	number of downstream links on path to outlet
53.8	13	39.6	33.6	89.9	0.4	16

Beaver Mountain						
Total Length (km)	Number of Stream Links	Distance from junction to outlet (km)	Total Length of upstream links (km)	total upstream area (km^2)	drainage density (length /area)	number of downstream links on path to outlet
29.32	7	45.5	29.3	67.1	0.4	18

9) The longest flow path in the Logan River Basin = 61178m = 61.178km