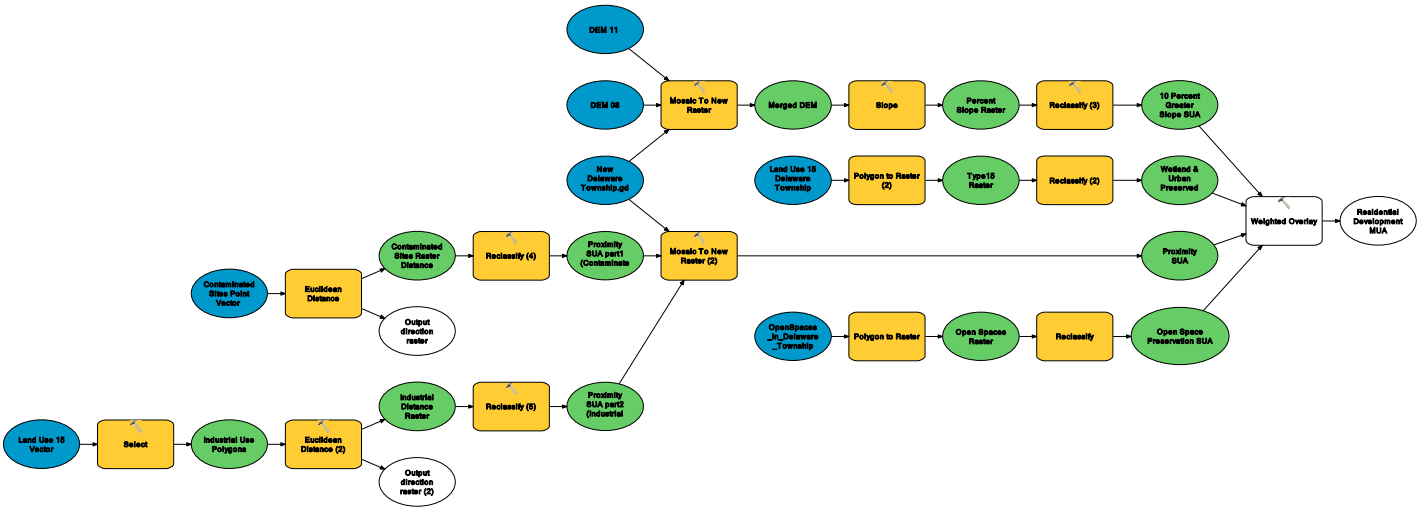

DEM 11
DEM 08
Mosaic To New Raster
Merged DEM
Slope
Percent Slope Raster
Reclassify (3)
10 Percent Greater Slope SUA
New Delaware Township.gd
Land Use 15 Delaware Township
Polygon to Raster (2)
Type15 Raster
Reclassify (2)
Wetland & Urban Preserved
Weighted Overlay
Residential Development MUA
Contaminated Sites Point Vector
Euclidean Distance
Contaminated Sites Raster Distance
Output direction raster
Reclassify (4)
Proximity SUA part1 (Contaminate
Mosaic To New Raster (2)
Proximity SUA
OpenSpaces_In_Delaware_Township
Polygon to Raster
Open Spaces Raster
Reclassify
Open Space Preservation SUA
Land Use 15 Vector
Select
Industrial Use Polygons
Euclidean Distance (2)
Industrial Distance Raster
Output direction raster (2)
Reclassify (5)
Proximity SUA part2 (Industrial

Model

Open Space Preservation SUA:

After downloading the data set called “State, Local, and Non-Profit Open Space of New Jersey” shape file from NJDEP Open Data website, polygon to raster conversion was performed to rasterize the data set. Then this data was reclassified by changing the State, Local, and Non-Profit cells to denote 1 and the NoData cells to denote 9 (which means area of highest suitability).

Wetland and Urban Preservation SUA:

The land use file of 2015 for NJ was downloaded from NJDEP Open website and was clipped by the boundary of Delaware Township. This file had land uses by type and by labels as well. The file was rasterized by performing polygon to raster conversion, by using type15 attribute as value. Among its attribute types, Wetlands, Water, and Urban Areas were reclassified to denotes 1 whereas all other areas cells, including nodata cells, were assigned the score of 9.

Ten Percent Greater Slope Preservation SUA:

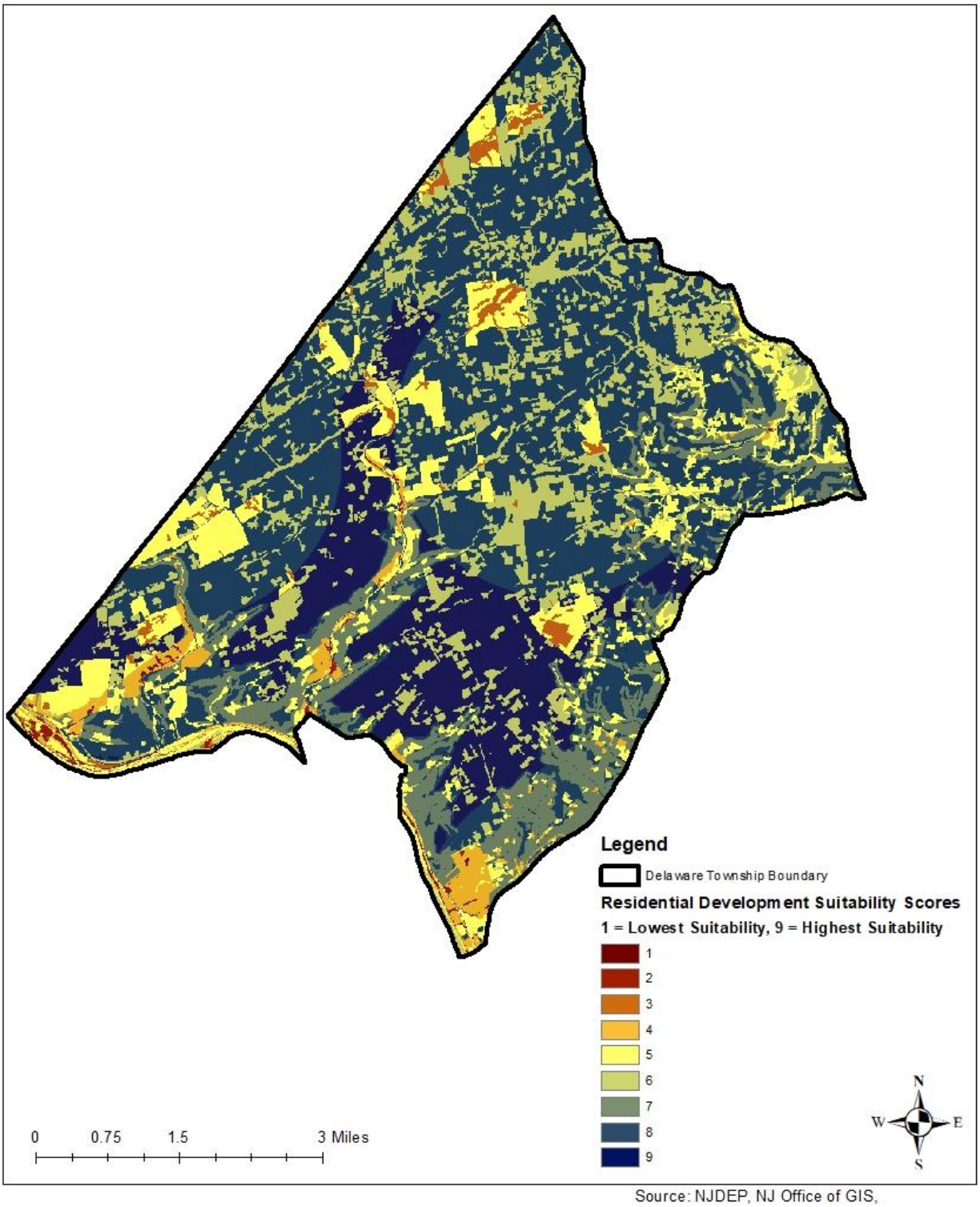
The digital elevation models of area 08 and 11 downloaded from NJDEP website was merged together using mosaic to new raster tool. This data was rasterized by calculating the slope in percents (not degrees) using Slope tool. The resulting raster file was reclassified from 1- 9: Percentages from 10 and above were classified as 1; 0-0.5 % was denoted 9 (most suitable due to small slope); 0.5 -1 % as 8; 1- 1.5 % as 7; 1.5 – 2 % as 6; 2 -4 % as 5; 4 -6 % as 4; 6 – 8 % as 3; and lastly, 8 – 10% as 2.

Industrial and Contamination Proximity SUA:

The clipped land use polygons for Delaware Township were selected by attributes to represent only Industrial land use polygons. This selection was then translated into distance raster using Euclidean Distance tool. The distances were classified from 1 -9: Within 3000 ft, all areas were denoted as unsuitable (1). The suitability scores increased with intervals of 3000 ft until a max distance of 5.3 miles was reached. This was the first of the two raster files that were used to make this SUA.

Secondly, the contamination sites vector points file was downloaded from NJDEP website and clipped again for Delaware TWP. This was rasterized using Euclidean Distance tool and reclassified with the same suitability score convention as for the industrial proximity raster. Then these two rasters were combined using mosaic to new raster tool to give proximity SUA with suitability scores from 1 -9.

Delaware Township Residential Development Suitability



Source: NJDEP, NJ Office of GIS,

It is observed that the majority of the areas in Delaware Township have a suitability score of 8 which is a good indication for any future residential development project. As for the areas of sites with the highest suitability score, they are the third highest in terms of acreage. These sites are situated in the south or mid -west region of township. However, sites with suitability score of 8 are spread throughout the township thereby granting a lot of flexibility for the planning committee to pick sites of their likings. Surprisingly, there are very few sites with low suitability score in Delaware TWP. In fact, the acreage of sites with lowest suitability happens to be the lowest among all sites. This shows that Residential Development based on the constraints of this project has propitious prospects with almost no conflict, apparently. I would recommend starting from the mid-south region of the municipality for such projects.

OBJECTID	VALUE	AREA (Square Miles)	PERIMETER (Miles)
9	9	151942496	771800
8	8	407257504	3188000
7	7	115127504	1249800
6	6	184522496	2652900
5	5	126475000	1683800
4	4	27015000	427500
3	3	14292500	236800
2	2	4530000	157500
1	1	1305000	56200

Weighting Method:

Rank sum weighting method was used by ranking the four layers as per the order of the objectives written in the assignment document. The reason this method was selected was because slopes SUA and proximity SUA were from 1- 9 whereas Open Space Preservation SUA and Wetland & Urban Preservation SUA were only 1 or 9. Therefore to prevent the range of 1- 9 values in the former two SUAs from skewing the results of suitability, it was needed to assign them such weights which lowers their importance, but it does not make their importance negligible. For this purpose, the sum weighting method was the perfect choice.

Rank Sum Weighting Method for 4 layers			**n = 4**	**w = (n-r+1)/Sum(n-r+1)**
Layer Name	**Rankings [r]**	**n-r+1**	**Weights**	
Open Space Preservation SUA	1	4	0.4	
Wetland and Urban Preservation SUA	2	3	0.3	
Industrial and Contamination Sites Proximity SUA	4	1	0.1	
10 Percent Greater Slope SUA	3	2	0.2	
		10	1	