Lab Exam GOG 521 Fall 2023

Name:

Question 1

**Deliverable 1-1:** Clear description of your analysis steps.

**Deliverable 1-2:** Transition matrix of land cover change.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 2006 |  |  |  |  |  |
|  |  | Urban | Agriculture | Forest | Wetland | Water | Total |
| 1990 | Urban |  |  |  |  |  |  |
|  | Agriculture |  |  |  |  |  |  |
|  | Forest |  |  |  |  |  |  |
|  | Wetland |  |  |  |  |  |  |
|  | Water |  |  |  |  |  |  |
|  | Total |  |  |  |  |  |  |

**Deliverable 1-3:** Answers to the 2 questions above.

**Deliverable 1-4:** Screen capture of the simplified land cover of the areas which became urban between 1990 and 2006.

Question 2

**Deliverable 2-1:** Clear description of your analysis steps.

* Used Raster Calculator to Create a new raster with areas of storm surge areas of 1m or less with the following condition: Con("dem\_lidar" <= 3.28084, 1, 0) converting from ft to meters.
* Used Focal Statistics to remove any low-lying areas with the new raster as the input.
* Converted the resulting raster to polygon using raster to polygon.
* Clipped study area to buildings.shp
* Used intersect with New polygon and clipped buildings layer
* Used Select By Attribute statements to find the following results.

**Deliverable 2-2:** Summary of your results, using a table like the one below

|  |  |  |
| --- | --- | --- |
| Type of building | Count of buildings impacted by 1 m surge | |
| Commercial | 2,402 |  |
| Garage | 565 |  |
| Residential | 10,673 |  |
| Shed | 1845 |  |
| Total | 15,485 |  |

Question 3

**Deliverable 3-1:** Clear description of your analysis steps.

* **Spatial join using Buildings and flood zones as inputs (one to one).**
* **Created a new field (InFloodZones)**
* **Calculated new field using the following condition:**

**'No' if 'X' in !Floodzones.Zone! else ('100-year' if 'A' in !Floodzones.Zone! else ('500-year' if 'B' in !Floodzones.Zone! else 'Unknown'))**

**This condition assigns a 100- or 500-year value to the field if the conditions are met (IE to clarify that X is no zone, A is 100 year, and B is 500 year.)**

* **To complete the table and the screenshot deliverable I created another new field (Added\_97\_03) for 500 year flood zone buildings built between 1997 and 2003.**
* **Then calculated the field using the following condition:**
* **'Yes' if int(!Source!) > 1997 and int(!Source!) <= 2003 else 'No'.**
* **To find the number of buildings and there area in sq ft, I Used select by attributes to sort by the newly created field and summarized the selection using the SHAPE\_Area field to get the sum of the area in sq ft.**

**Deliverable 3-2:** Two tables like those above.

|  |  |  |  |
| --- | --- | --- | --- |
| Floodzone | Number of buildings | | |
|  | Present in 1987 | Added between 1987 to 1997 | Added between 1997 and 2003 |
| 100-year  500-year | 102  370 | 152  594 | 156  763 |

|  |  |  |
| --- | --- | --- |
| Landuse | Buildings added from 1997 to 2003 | |
|  | Number of buildings | Area of buildings (sq. feet, no decimals) |
| 100 Single Family (100) or Duplex (150) | 243 | 958 ft2 |
| 113 Mobile Homes  160 Large-lot Single Family | 29  N/A | 23,103 ft2  N/A |
| 200 Multi-family | 27 | 164,333 ft2 |
| 300 Commercial | 128 | 235,765 ft2 |
| 400 Office | 35 | 330,617 ft2 |
| 500 Industrial  560 Resource Extraction (Mining) | 3  N/A | 39,844 ft2  N/A |
| 600 Civic | 17 | 534,405 ft2 |
| 700 Open Space | 33 | 25,822 ft2 |
| 800 Transportation | 5 | 20,441 ft2 |
| 860 Streets and Roads | 9 | 12,583 ft2 |
| 870 Utilities | 6 | 2853 ft2 |
| 900 Undeveloped | 4 | 6857 ft2 |
| 940 Water  999 Unknown | 0 | 0 |

**Deliverable 3-3:** Screen capture showing the floodzones in the study area with the buildings added between 1997 and 2003 that are located in the 500-year floodzone.

A map of a city

Description automatically generated

Question 4

**Deliverable 4-1:** Clear description of your analysis steps.

**Deliverable 4-2:** Screen capture of your cost surface. Make sure to include a legible TOC or legend.

**Deliverable 4-3:** Screen capture of your final corridor. Make sure to include a legible TOC or legend.

Question 5

**Deliverable 5-1:** Clear description of your analysis steps.

* Created new viewshed using the viewshed tool with the DEM as the input.
* Extracted values to points using the viewshed and viewpoints.
* Used observer points tool with observer point values feature class and viewshed as inputs.
* Analyzed the resulting attribute table to fill out the table below.

**Deliverable 5-2:** Matrix of the results of your intervisibility analysis of the viewpoints.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Viewpoint 1 | Viewpoint 3 | Viewpoint 4 | Viewpoint 7 | Viewpoint 8 | Viewpoint 9 |
| Viewpoint 1 | - | Not Visible | Not Visible | Not Visible | Visible | Not Visible |
| Viewpoint 3 | Not Visible | - | Not Visible | Visible | Visible | Not Visible |
| Viewpoint 4 | Not Visible | Not Visible | - | Visible | Visible | Not Visible |
| Viewpoint 7 | Not Visible | Not Visible | Not Visible | - | Not Visible | Visible |
| Viewpoint 8 | Not Visible | Not Visible | Not Visible | Not Visible | - | Not Visible |
| Viewpoint 9 | Not Visible | Not Visible | Not Visible | Not Visible | Not Visible | - |

**Deliverable 5-3:** Which viewpoint(s) is (are) the most visible from other viewpoints? Which one(s) the least?

**Deliverable 5-4:** Top three viewpoints with the largest visible area as a % of the total study area. Report the viewpoint ID as well as the percentage.