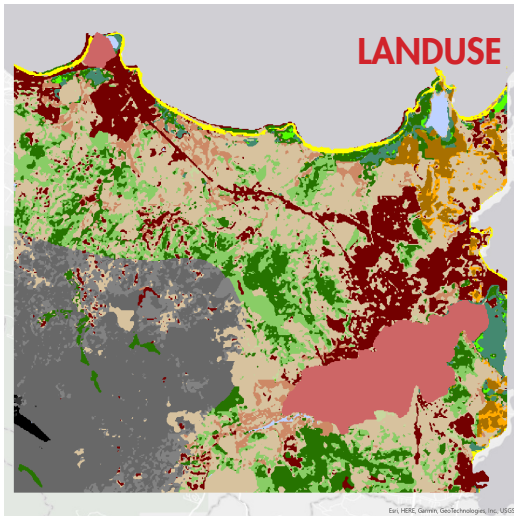# Homework 6 Set up checkpoints   Zile WU

For this week's assignment, we will use distance accumulation to calculate the best location for a checkpoint by combining the height and site type of Puerto Rico.
Tools used :
Reclassify / Distance Accumulation / Cell Statistics / Optimal Path as Raster / Raster Calculator
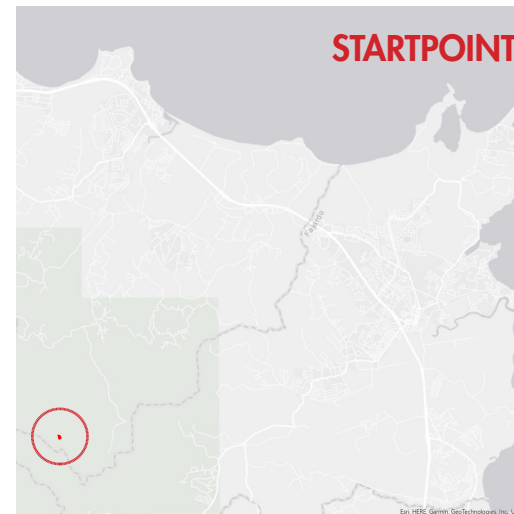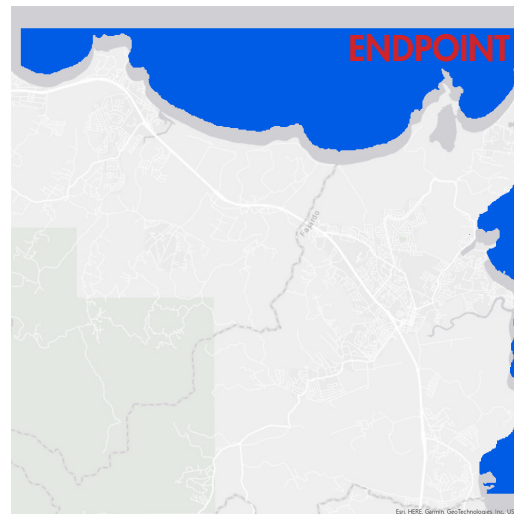

LANDUSE

ROAD

ELEVATION

Step 1 - Input Data

We use data in three categories:
LANDUSE layers as route resistance and endpoint screening.
The ROAD layer used to determine the location of checkpoints.
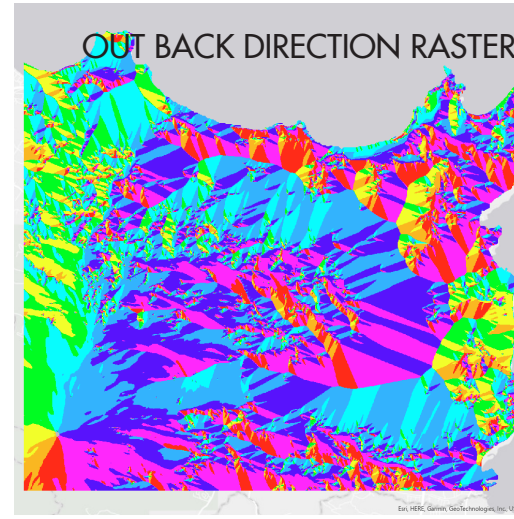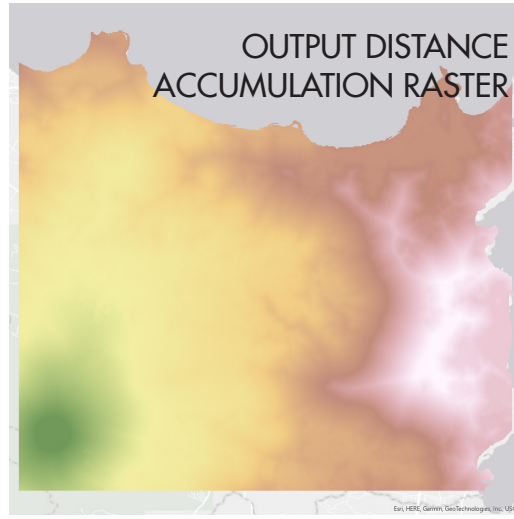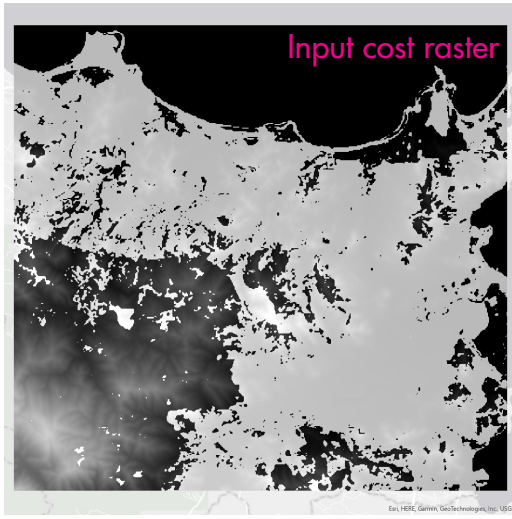ELEVATION layer as route resistance and startpoint.

Reclassify the LANDUSE layer to creat the land friction with rivers, roads, non-forest land, and populated areas,
Above raster = 600, Others = NODATA
and select all the ocean raster as endpoint.
Ocean = 1 Others = NODATA

Reclassify the ELEVATION layer to select the startpoint.
elevation between 660 to 670 = 1
others = NODATA

FRICTION

ENDPOINT

STARTPOINT

Input cost raster

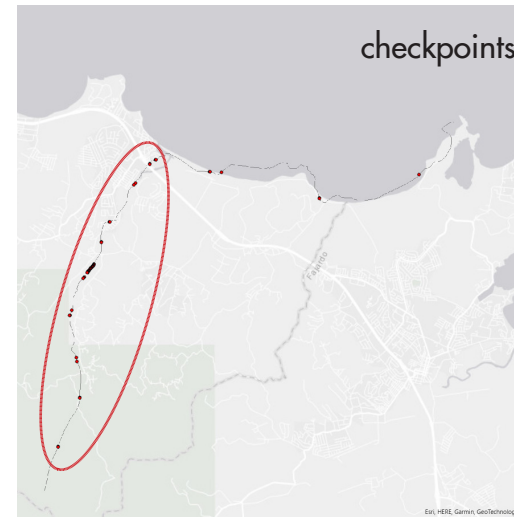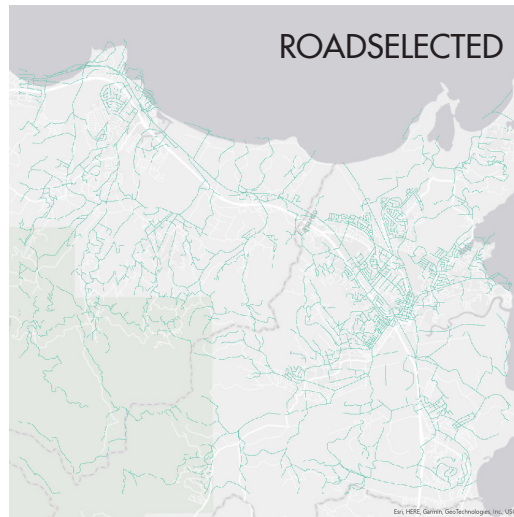OUTPUT DISTANCE ACCUMULATION RASTER

OUT BACK DIRECTION RASTER

Step 2 - Distance Accumulation

We use the friction layer made in the previous step together with the existing height to calculate the distance accumulation based on the starting point.

Use Cell Statistic to sum up the ELEVATION layer and the FRICTION layer as the Input cost raster
Set STARTPOINT as the Input raster.
And then we get the OUTPUT DISTANCE ACCUMULATION RASTER and OUT BACK DIRECTION RASTER

optimal path

ROADSELECTED

checkpoints

Step 3 - Optimal Path as Raster

Using the previously obtained
OUTPUT DISTANCE ACCUMULATION RASTER, and OUT BACK DIRECTION RASTER, calculate the best possible path

Use Optimal Path as Raster to find the optimal path.
Reclassify the ROAD layer to select all the roads as ROADSELECTED layer.
Finally use Raster Calculator
ROADSELECT == optimal path find all the checkpoints
Due to the value of landfriction, the points in the circle may be the better check points

Tips.
the Projected coordinate system of the source data is NAD 1927
the Projected coordinate system of the bottom map is WGS 1984
the There may be a slight misalignment between checkpoint and the bottom map