**Determining the possible population affected for floodplains in the north of Colombia.**

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**Methods**

**Processing Imagery.**

For The raster of Landsat downloaded I do classify supervise.

I used 4 classes

Water: include all water, rivers, streams, sea, and reservoirs.

Urban: all towns, roads, cities.

Nature: soils, vegetation

Crops: agriculture.

For each class I used 10 samples initially.

After of execute supervise classify, I had repeat the process four times, and finally I used 38 samples.

The image Landsat have values null represented with pixels. In this step I removed the null value with the Set Null Tool.

**Create Rivers and Streams.**

With the tool Raster to polygon, I transform the raster to polygon.

Then Using the Select tool I extract the polygons with water, except the sea. For this I use a SQL expression for extract the values of the pixels by water only and reduce the count of polygons that probably are not water. For this, is selected shape\_area>10000.

**Create Towns Polygons.**

With the same procedure for the rivers is created the Towns. For this, isn’t selected filter in area, because the raster lost many polygons.

**Create Towns Polygons with Census population.**

In this step with the tool Tabulate Intersection I create the data of Census for the towns polygons. I received the population by each polygon but must be re calculating using the percent of area in the counties. I had to do it, because I don’t have the census by towns.

Tools used: tabulate intersection, join relation, field calculator, export data.

**Create areas flood.**

I use the Buffer tool for create the floods area of rivers and streams. Then I used the intersect tool for create the towns polygons with floods.

Calculate population in flood.

For the last I calculate the population in places with flood using the field calculator same way that I calculated the population by town.

Note:

I estimate the population by area of floodplains with percent of area.

**Results**

After I run the analysis, I estimate the population affected by the floods (shown in data tables) with a total of 30,340 people. Although it is an important number, it is known that more people are affected during the winter, but in this analysis I can only estimate the affected population directly in the explanation of rivers and streams, it is not possible to estimate the affected population indirectly. Further the image of Landsat isn’t very accurate.