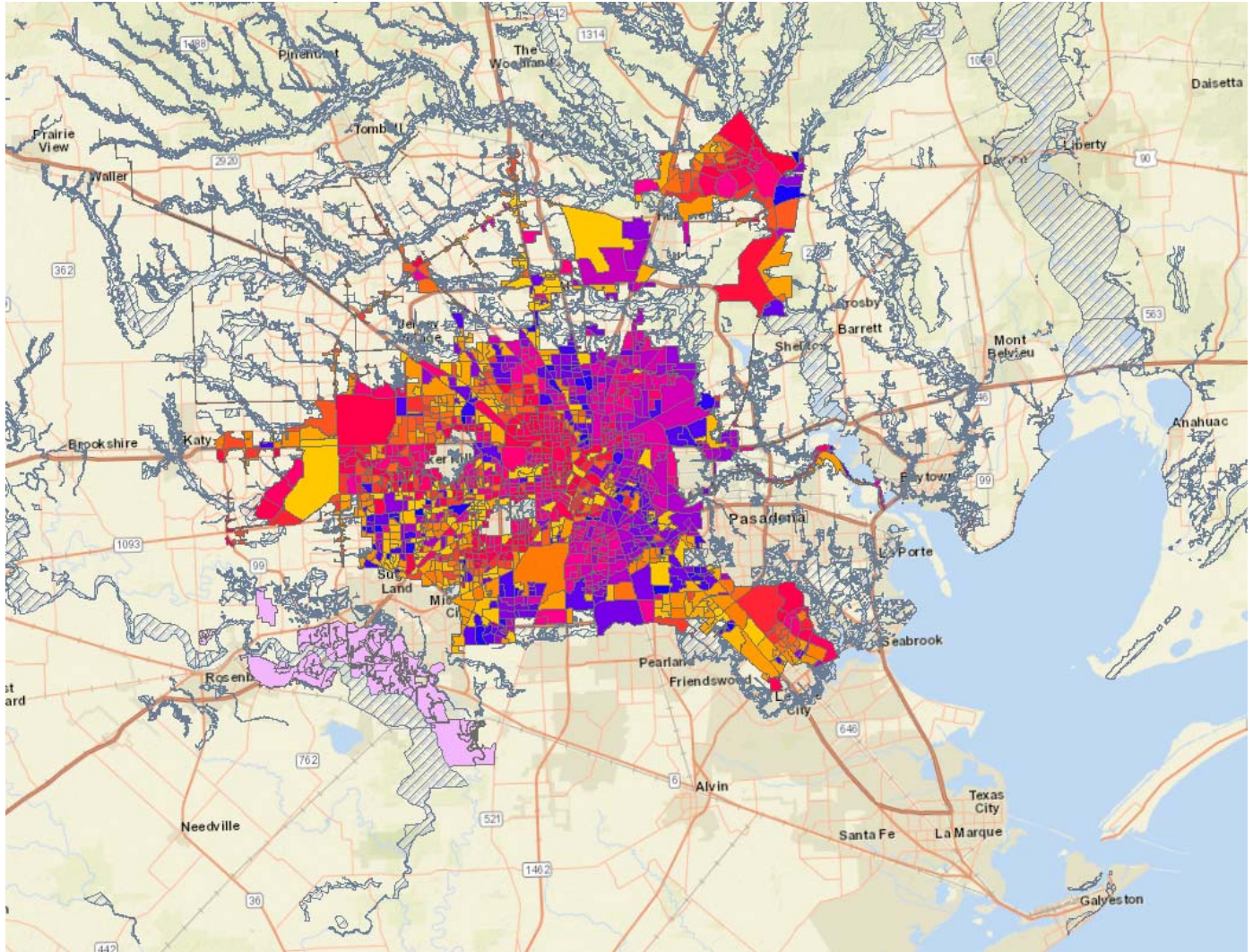


## The Effect of Floodplains on House Values in Houston, Texas

### Hypothesis

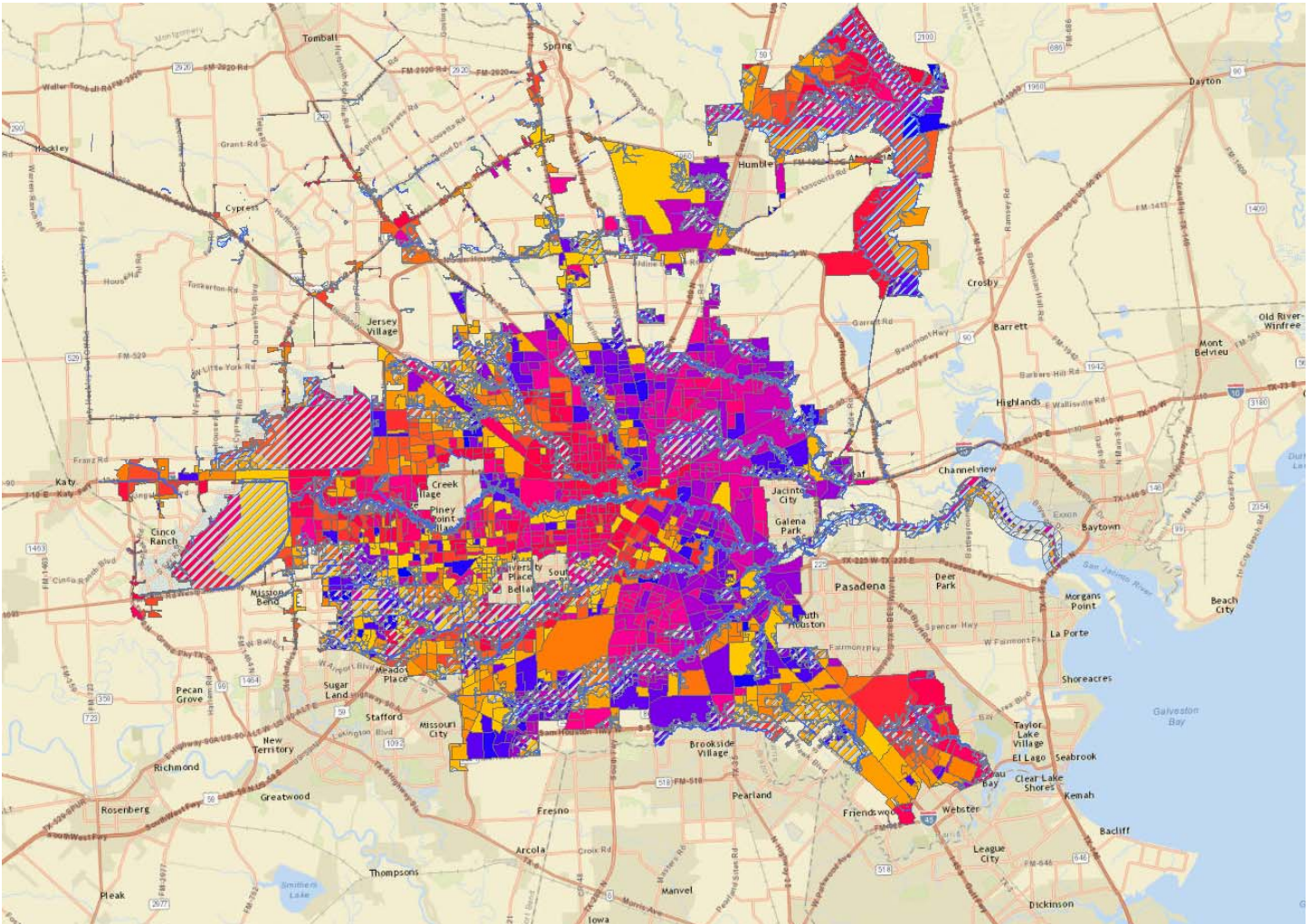
The goal of this project is to assess whether or not property and house values are affected by their location on a floodplain. My hypothesis is that if an area is more highly prone to flooding its property value will suffer.

- 1) I collected data from the city of Houston GIS open data ([cohgis.mycity.opendata.arcgis.com](http://cohgis.mycity.opendata.arcgis.com)). The floodplain data comes from FEMA. Both datasets were applied to a Texas basemap, as shown in **Figure 1**.



**Figure 1:** Initial layout of map after all data is added to the dataframe.

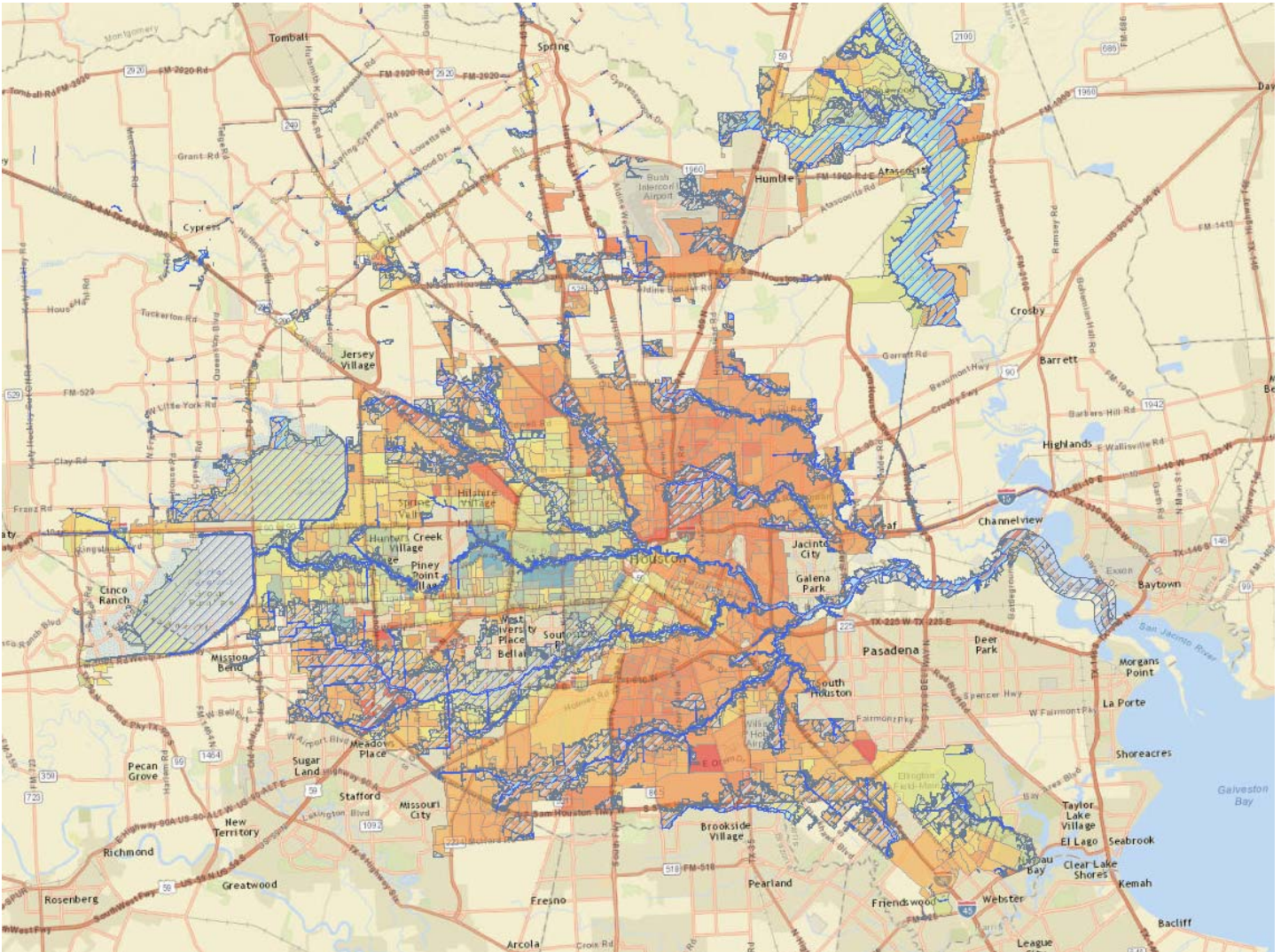
- 2) I clipped the floodplain data to within Houston city limits, as shown in **Figure 2**. (Median House Value data was only for Houston City limits)



**Figure 2:** Map post-clipping to Houston city limits

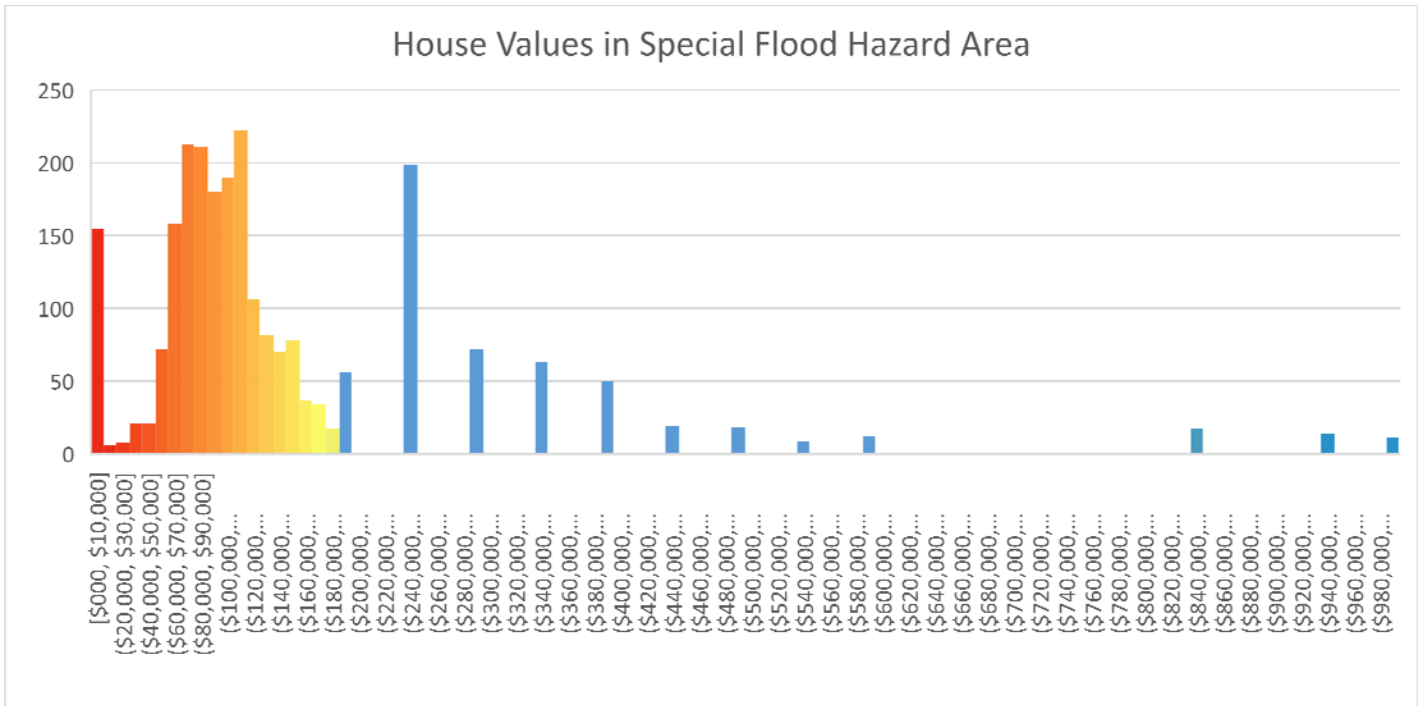
- 3) I added the Median\_House\_Value\_by\_Census\_Block\_Group\_2010 dataset and added a gradient to show the highs and lows of property values.
- The Median House Value field in the Attribute Table was out of order because it was a text field instead of a long integer field. I created a new value field called "HouseVal" That changed the text field into a long integer field. In order to group the values as ranks instead of each individual value, so as to clean up the Legend, I added a new value field called "Value". I grouped house values in increments of 10,000 up to 200,000. After 200,000, they were grouped by increments of 50,000 up to 1,000,000. The final attribute table is shown in **Figure 3**.
  - Areas that a 0 for House Value were changed to a light pink so it was more obvious.
  - I added 30% transparency to more easily see what part of the city is affected
  - The final Median\_House\_Value\_by\_Census\_Block\_Group\_2010 shapefile's gradient symbology is shown in **Figure 4**.





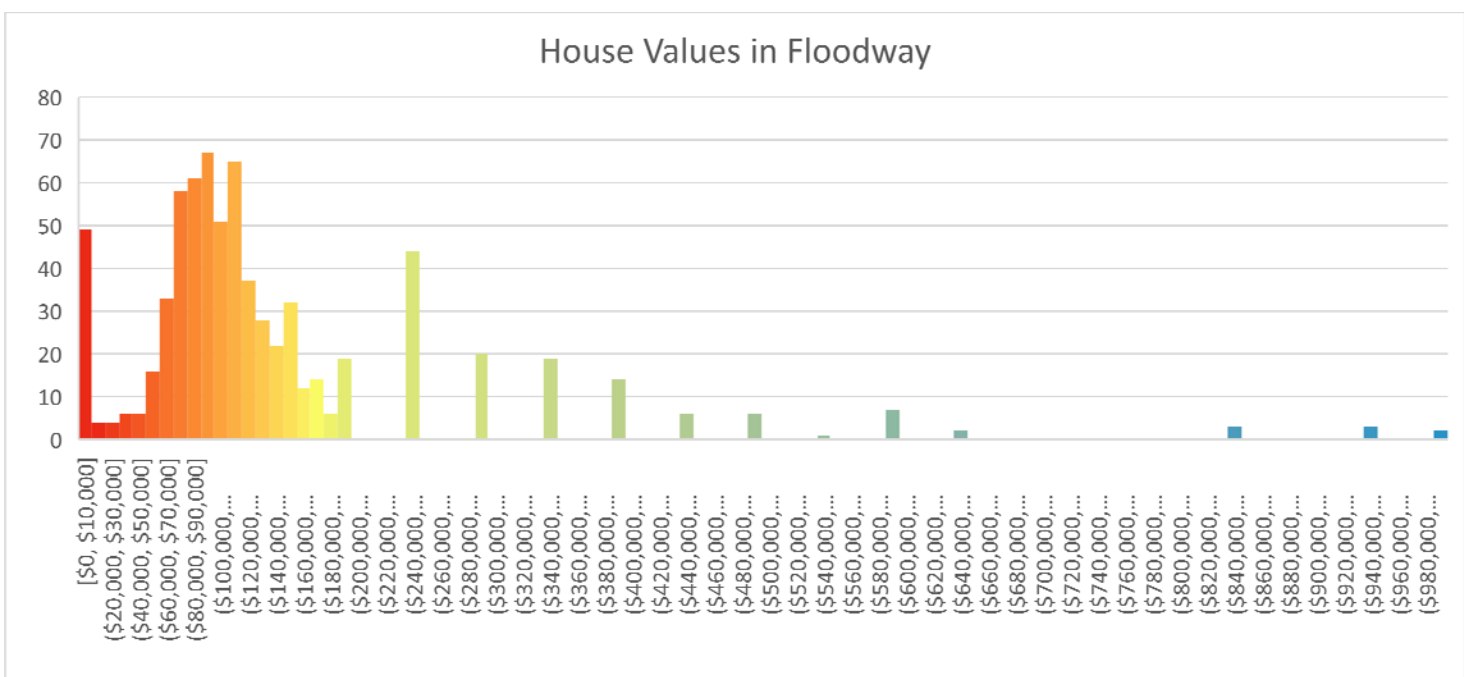
**Figure 4:** Map after gradient symbology and 50% transparency has been applied to the Median\_House\_Value\_by\_Census\_Block\_Group\_2010 shapefile.

- 4) I wanted to make a graph showing the parts of the city that are affected by the different levels of flood.
  - a. Using the Select by Attribute tool, I separated Floodway, Special Flood Hazard Area, and 500 Year Floodplain into individual shapefiles
  - b. I used the Intersect tool to create shapefiles that show areas that are in the Floodway, Special Flood Hazard Area, and 500 Year Floodplain areas.
- 5) I created graphs using these new intersected shapefiles showing the property values of the areas within these zones.
  - a. I copied the attribute table into Excel and created histograms from there.



**Figure 5:** Each bar in the histogram was given a specific RGB color value that corresponded to its value in the Median\_House\_Value\_by\_Census\_Block\_Group\_2010 shapefile symbology.

- b. I manually matched colors for the histograms to the colors of the census zones used in the map.
- c. I compared the three maps together with a graph of House Values not in any floodplain. These graphs are presented in **Figures 6, 7, 8, and 9.**



**Figure 6:** Histogram depicting the amount of houses falling in each House Value category within the general floodway.

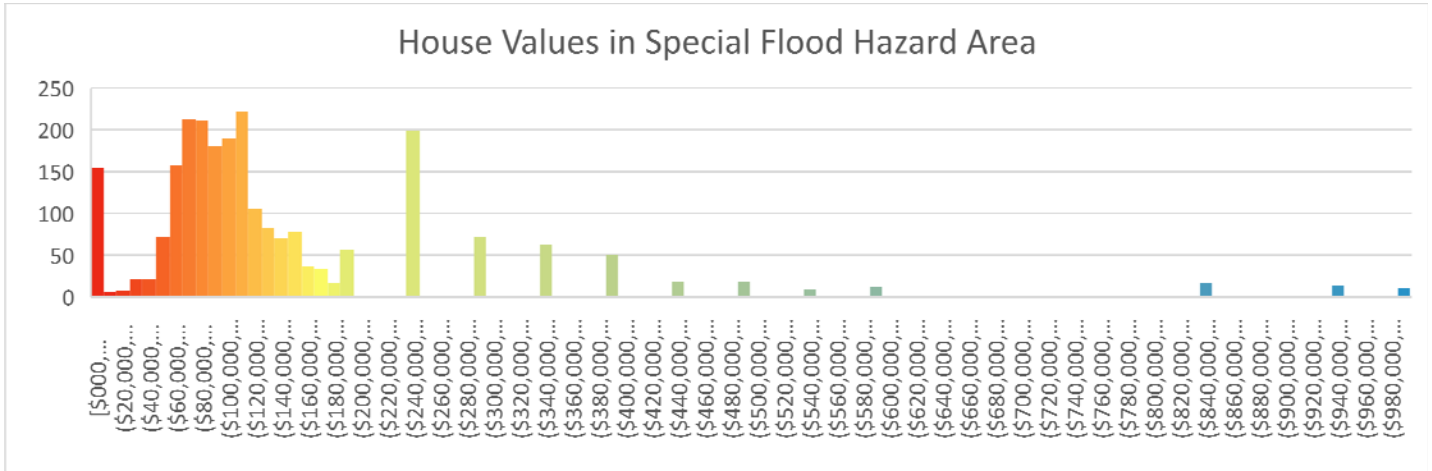


Figure 7: Histogram depicting amount of houses falling in each House Value category within the special flood hazard area.

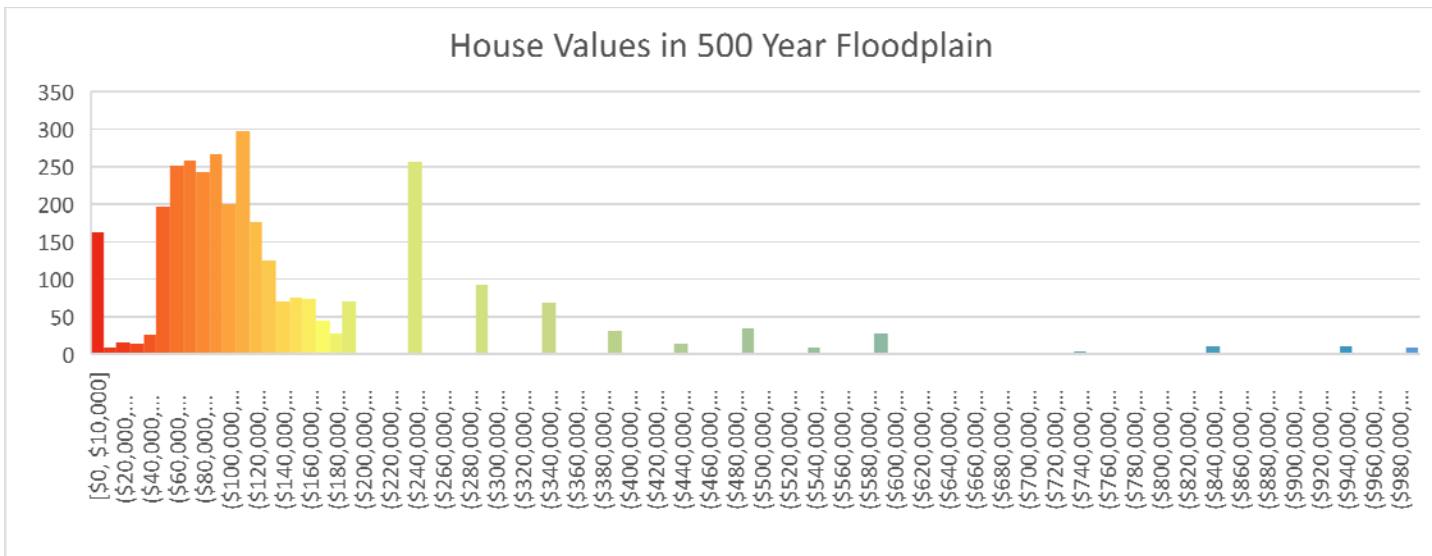


Figure 8: Histogram depicting the amount of houses falling in each House Value category within the 500 year floodplain.

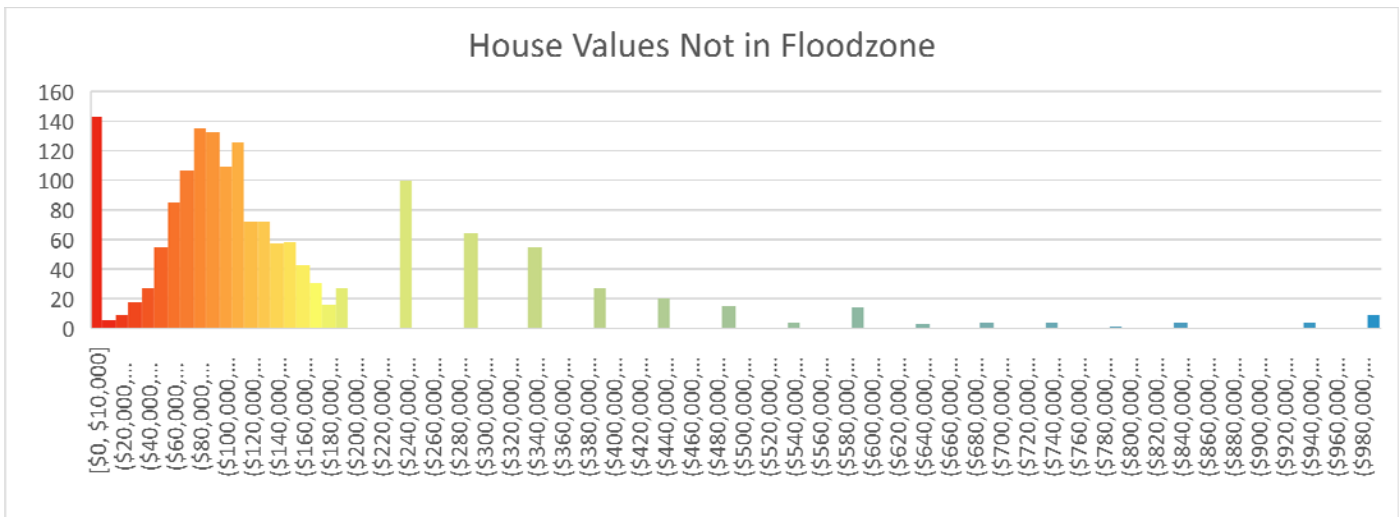


Figure 9: Histogram depicting the amount of houses falling in each House Value category outside of the floodzone.

- 6) The final map includes an inset of a closer view to the downtown Houston area for a clearer look at the symbology presented.

**Conclusions:**

As the graphs indicate, there doesn't seem to be a correlation between a district's location in a flood zone and its property value. This goes against my original hypothesis, but the end result is still very interesting. Considering Houston's historical location in low-lying, swampy area, it isn't all that surprising that property values are not significantly affected by the danger of flooding.

# Map Showing the Effect of Floodplains on House Values in Houston, Texas

