"How has the market for houses in the greater Houston area been affected by Hurricane Harvey?"

Abstract:

This essay focuses on how Hurricane Harvey has affected the housing market in Houston, Texas; specifically, on how it has affected flooded and unflooded homes' prices. The research question is "**how has the market for houses in the greater Houston area been affected by Hurricane Harvey**?"

Various locations across the greater Houston area were chosen; houses ranged from very expensive to lower cost. Five areas were chosen using this cost criterion as well as how affected the areas were; in particular Meyerland and Memorial were deeply affected during Hurricane Harvey. Fifty houses within these neighbourhoods were chosen at random, including flood damaged, untouched and unknown condition homes. The house price data was collected utilising Zillow, a real estate website, using quarterly figures from March 2017 to March 2018. Through the use of this secondary data, graphs, tables and maps were generated with trends analysed and discussed.

Utilising the data gathered and the Spearman rank-order correlation, it was observed that there was positive correlation between flood levels and the percentage changes in *flooded* house prices. This suggested that the price drop was due to lower consumer confidence, demand dropped and the prices and quantity of purchased houses dropped consequently. In general, the theory and evidence presented illustrates that prices of *unflooded* homes have increased as a result of Hurricane Harvey, and conversely how prices of *flooded* homes have decreased.

(Word Count: 228)

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I- Introduction:

Hurricane Harvey affected the entire Houston area detrimentally, as well as Puerto Rico and parts of the Caribbean, lasting from late August to early September 2017[1]. In total, the damage cost $125,000,000,000 (National Hurricane Centre). This is particularly significant as although Harvey's death toll was not as high as Hurricane Katrina's (2005) (82 and 1,833 respectively[2]), Harvey dropped 27 trillion gallons of rain[3] whereas Katrina dropped 6.5 trillion[4]. Perhaps the largest effect of Harvey was the number of houses flooded and destroyed, specifically over 100,000 in Houston alone[5].

Harvey's main destructive impact was on housing; thus, the focus of this essay is the effect of Hurricane Harvey on prices of houses. All houses examined are in neighbourhoods that were badly affected; north-east of Houston was hardly affected so it wasn't included in the investigation. Additionally, the neighbourhoods chosen represent various wealth bands; River Oaks is very affluent and an old, established community, Cinco Ranch is middle band and a newer community, Meyerland is an old middle-class area, Pasadena is an old lower-income area, and Memorial is a newer middle-class community. The worst affected areas in Houston (using the data collected) are Memorial and Meyerland.

House types are divided into flooded and unflooded houses. Thus, it can be an established whether the prices of unflooded homes have increased due to increased demand, and whether the prices of flooded homes have decreased due to less demand for these homes as they are more prone to flooding. The main idea is that of how **preferences and tastes** alter the demand for housing, as well as **consumer confidence**. Through the investigation, only one type of housing was chosen: detached housing. The pricing of apartments, condominiums and lots/land were not included.
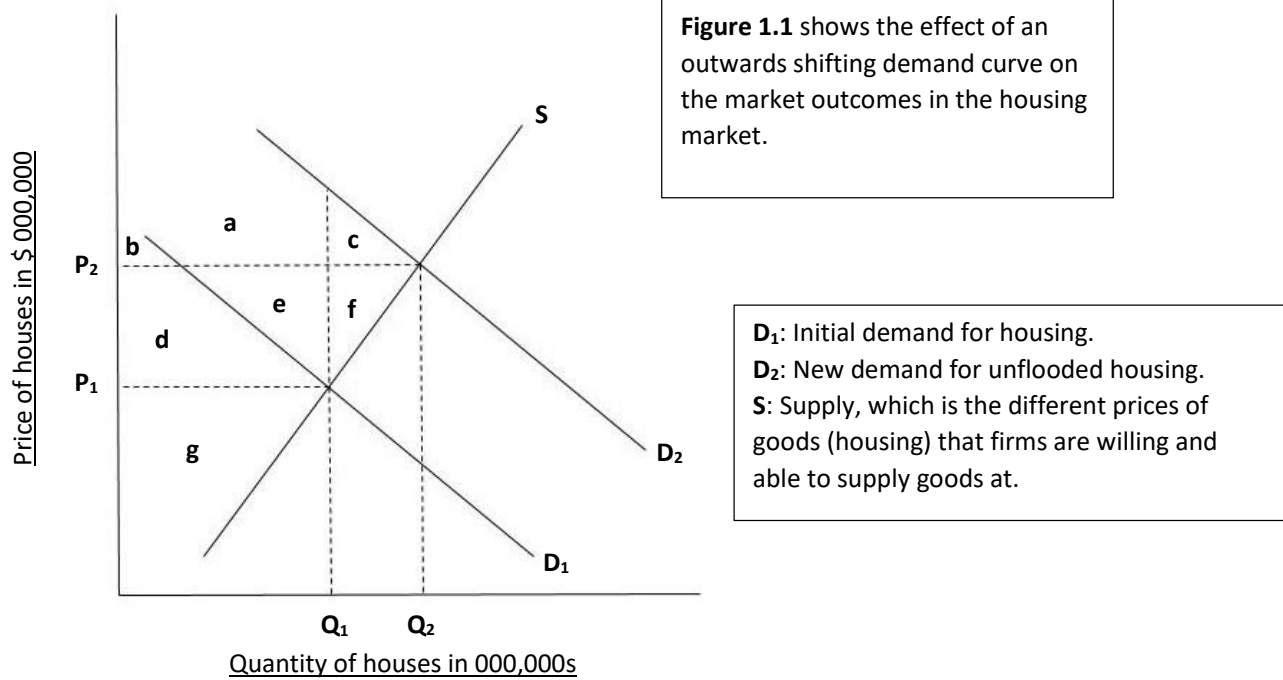
To help evaluate the economic effects of Hurricane Harvey in the greater Houston area, a research question was formed; "**How has the market for houses in the greater Houston area been affected by Hurricane Harvey?**" The economic theory applied is the theory of supply and demand altering

due to changes in housing conditions, thus prices fluctuate. The majority of the data collected comes

from Zillow[6], an online real estate website. To compare flood data and house prices, actual flood

data was needed, thus the Harris County flood mapping tool[7] was used.

II- Economic theories related to the housing market before and after Hurricane Harvey:

i- *Supply and demand:*

The main theory that applies to the changing prices of housing in Houston is supply and demand. As

market demand, which is the sum of each individual demand for goods, is changed by preferences

and tastes, as well as consumer confidence, this can result in the demand curve shifting inwards or

outwards, (see **figure 1.1**).

Figure 1.1 shows the effect of an outwards shifting demand curve on the market outcomes in the housing market.

D_1: Initial demand for housing.
D_2: New demand for unflooded housing.
S: Supply, which is the different prices of goods (housing) that firms are willing and able to supply goods at.

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Generally, there is a preference for housing that hasn't been flooded as houses will likely not be affected by a future flooding, so less investment is needed in the house. As shown in **figure 1.1**, as demand for goods (i.e. housing) increases, the market equilibrium shifts, causing increases in prices of housing that have not been flooded, as well as an increase in quantity demanded for these houses. Thus, the quantity demanded for unflooded houses would be at Q_2, an increase from Q_1, and the prices of unflooded housing would be higher at P_2 than the initial price at P_1.

The letters on **figure 1.1** represent consumer and producer surpluses. At the level of the initial demand at D_1, consumer surplus is areas $b + d$, and producer surplus is area g. However, as demand for unflooded housing shifts outwards and to the right, due to more consumers being willing and able to buy housing at any given price, consumer surplus equals areas $a + b + c$, whereas producer surplus is areas $d + e + f + g$.

Demand for housing changes due to changing consumer preferences and tastes, as well as consumer confidence. As illustrated in **figure 1.1**, demand shifts outwards. This could be due to consumer confidence; consumers will be more willing and able to buy unflooded housing as it requires fewer running costs for repairs, as it is less susceptible to future flooding. Thus, at any given price, there are more consumers willing to purchase unflooded homes, resulting in the outwards shift in the demand curve.

<center>ii- <u>*Asymmetric Information:*</u></center>

Asymmetric information links to the idea that buyers and sellers do not have equal access to information, resulting in a misallocation of resources to the production of goods or services. In the housing market, sellers have more information on housing conditions than buyers, as there is no regulation for sellers to list these conditions. The sellers have a better idea of the amount of damage

housing has been susceptible to, and the cost and quality of repairs. Linking to **figure 1.1**, if perfect

market information existed, consumers would know the houses' condition, so if the housing was not

flooded, there would be greater demand for it, resulting in an outwards shift in the demand curve

from D_1 to D_2, meaning the quantity of unflooded housing as well as the price would increase

consequently.

The idea of a moral hazard also links to the housing market in Houston. Moral hazard: occurs when

one party in an economic transaction takes risks, however, they do not face the entire costs of these

risks. For the housing market in Houston, the owners of housing, who buy flood insurance, do not

face the full costs of the risks they have accepted- they do not have to pay entirely for damage. In

general, this means flood insurance is underprovided in the housing market. Another example of

asymmetry in the market for housing is adverse selection, where the owners of houses that buy

insurance have more information about themselves than the insurance providers.

Figure 1.2 below shows how a lack of asymmetric information (so there is lots of information) in the

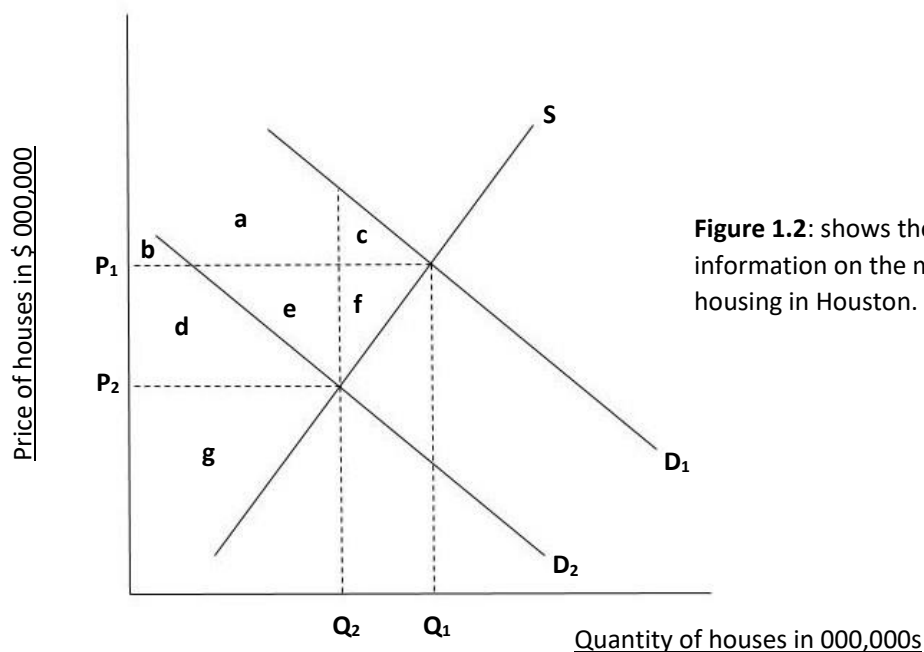housing market can affect the market outcomes for flooded houses.

Figure 1.2: shows the effect of perfect information on the market for flooded housing in Houston.

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Demand shifts inwards from D_1 to D_2 because of changing consumer preferences, as mentioned before. Consumers are less willing to spend money on housing that is more prone to flooding, so consequently, demand shifts to the left because, for any given price, there are less consumers wanting flooded housing. Thus, the price of this flooded housing decreases from P_1 to P_2. At D_1, consumer surplus; the difference between the highest price consumers are willing and able to pay for housing and the price eventually paid for housing, is equal to areas $a + b + c$. On the other hand, producer surplus; the difference between prices received by firms for selling housing and the lowest price they are willing and able to accept to supply housing- is equal to areas $d + e + f + g$. When demand shifts inwards to D_2, producer surplus results in being equal to area g, whereas consumer surplus equal to areas $b + d$.

iii- *Assumptions of the economic theories:*

Although it seems reasonable that consumers would be less willing to spend money on flooded housing, and more willing to spend money on unflooded housing, this is just an assumption, and it may not be completely true. It depends on the price elasticity of demand of the housing, which is the responsiveness of a change in quantity demanded due to a change in price (of housing). The theory also assumes that there is an inwards or outwards shift in the demand curve for housing due to consumer confidence and preferences/tastes, but there also may also be other demand factors that influence the market; some of the non-price determinants of demand could include: income and demographic changes.

III- Methodology used to collect data:

Secondary research from Zillow was used to find quarterly house prices from March 2017 to March 2018; I added separate prices to find how flooded and unflooded house prices have fluctuated for each area before and after Harvey. Quarterly data figures have been collected for March, June, September and December of 2017 and March 2018. As Harvey occurred during late August and early September 2017, price changes were expected to occur around this time of year. Secondary data will be used to create my own graphs and diagrams of percentage changes in house prices, as well as flood maps with interpreted trends.

Additional data was sourced from the Harris County flood education mapping tool to find flood levels during Harvey. Different neighbourhoods across Houston were affected differently, so flooding data is necessary to evaluate whether the house price changes were caused by flooding.

Because some houses did not have their flood condition mentioned, for each specific neighbourhood they weren't included in the flooded and unflooded housing data for this study; although, they were included in the whole Houston average.

As previously mentioned, data was collected from five neighbourhoods: Meyerland, Cinco Ranch, River Oaks, Pasadena and Memorial (**figure 2.1**). These locations were chosen because all the areas except for Cinco Ranch and Meyerland are near to Buffalo Bayou. Cinco Ranch was chosen because it is a newer community, and Meyerland was chosen because it received significant rainfall.

Figure 2.1: A map of the greater Houston area to show chosen locations[8].
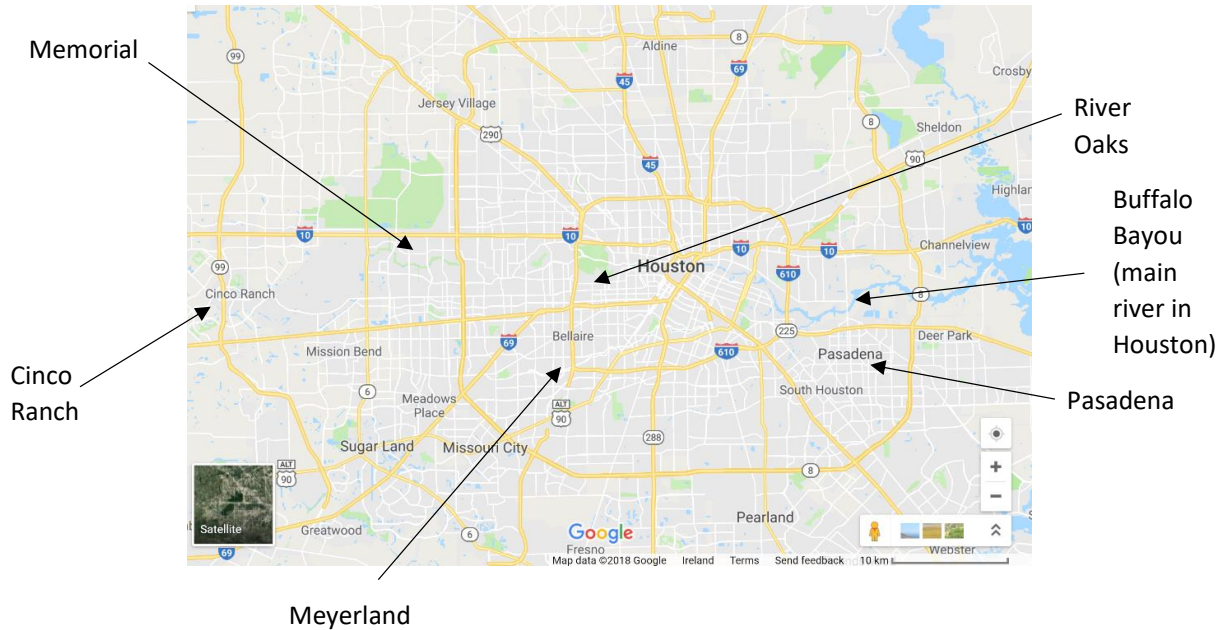
The first set of data collected consisted of quarterly house prices from a sample of fifty houses for each neighbourhood. House prices from March 2017, June 2017, September 2017, December 2017 and March 2018 were used. For each neighbourhood, the house condition was also mentioned. **Green indicated no flooding or damage** during Hurricane Harvey, **yellow means no mention of flood conditions** and **red means the house had some flood damage**. Houses with different flood conditions were separated to find out what had happened to each set of housing.

The next data collected was rainfall data from August 26th to 29th 2017[9]. The reason for this time frame was because Harvey hit Houston during these dates, although it formed earlier and lasted until September 2nd. The data used in section IV comes from **tables 4-8** (see appendix).

IV- Data analysis:

i- *House prices:*

Figure 3.1: Meyerland average house price of flooded vs not flooded housing from **table 4** in appendix.
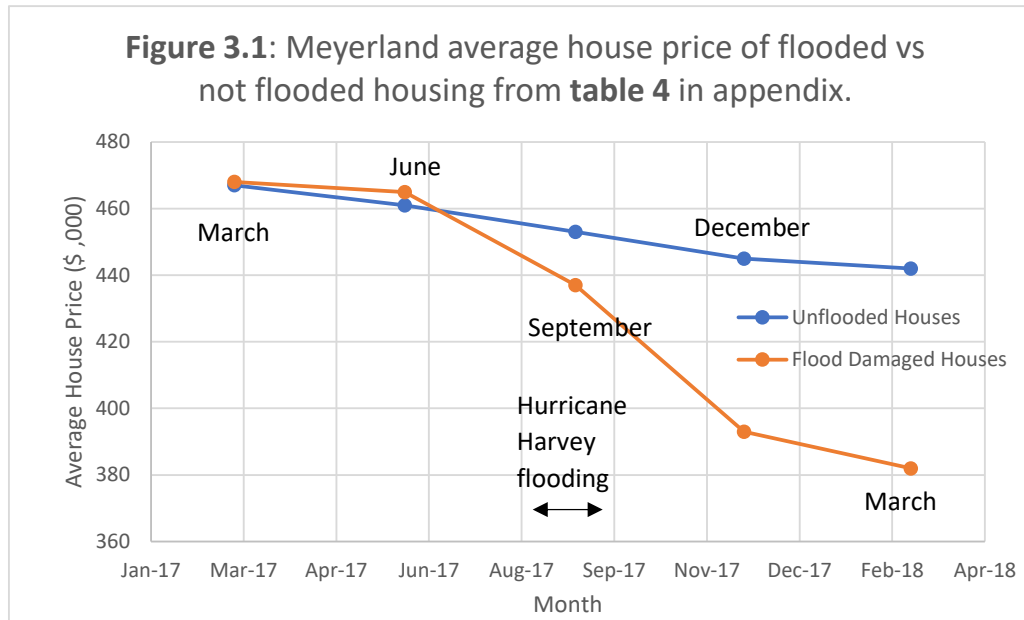
As seen in Meyerland (**figure 3.1**), both flooded and unflooded houses saw price decreases in the March 2017- March 2018 period. It is clear from the figure that flood-damaged houses have had a much steeper price decline, which is not surprising. Although it could be predicted that unflooded homes should have had a price increase due to greater demand for unflooded homes (see **figure 1.1**), Meyerland was badly affected during Hurricane Harvey, thus demand for *all* of the housing in Meyerland may have been lower. The steepest decline in house prices was from September to December, and this coincided with the time immediately after Hurricane Harvey flooding. It can thus be interpreted that the steep house price drop is due directly to houses being flooded and thus, lower demand for them. At any given price, then, there is a fewer number of people willing to purchase housing.

Figure 3.2: Cinco Ranch average house price of flooded vs not flooded housing from **table 2** in appendix.
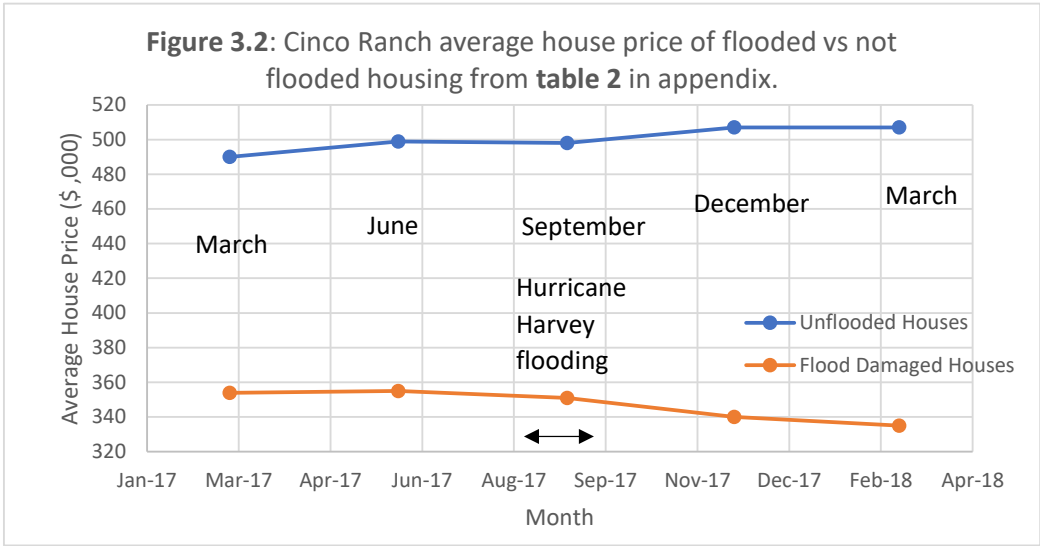
As seen in the graphs for Cinco Ranch (**figure 3.2**), unflooded houses' prices increased since Harvey, whereas the flooded houses' prices decreased, both linking to **figure 1.1** and **figure 1.2**. There is a preference for housing that hasn't flooded, thus its prices and quantity bought increased due to an outward shifting of the demand curve. Conversely, flooded housing's prices decreased, which is likely due to decreasing demand for flooded housing as these houses are prone to flooding, resulting in more money needed for flood protection as well as repairing damage, thus **consumer confidence** may have been lower. Another trend in the data is that unflooded housing's prices in general are significantly higher than flooded housing (approximately 25% to 30%). This could be a result of the housing being built on more expensive, elevated land that is less likely to flood, while housing in lower lying areas may have flooded previously, thus, depressing their price.

Figure 3.3: River Oaks average house price of flooded vs not flooded housing from **table 6** in appendix.
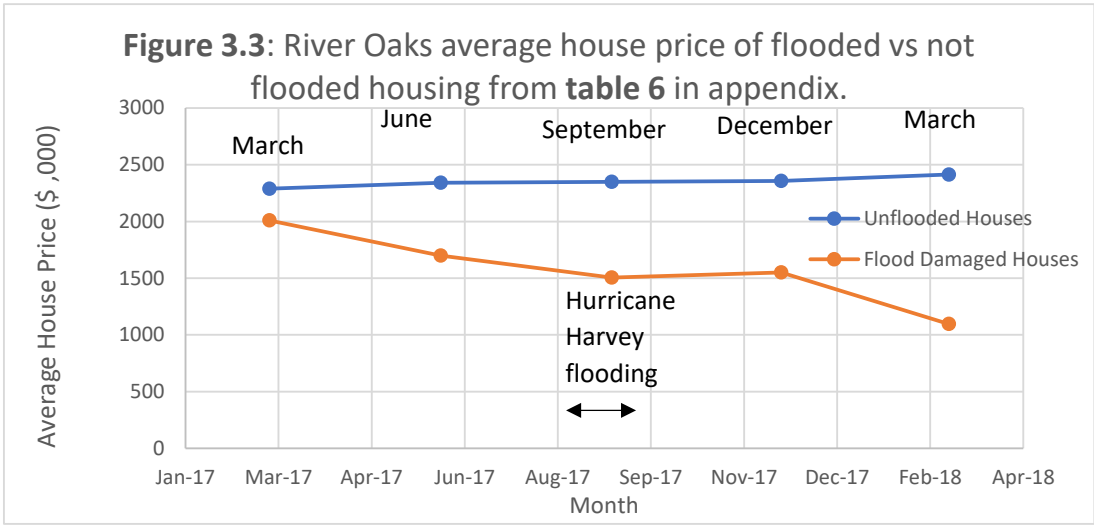
One clear trend from the River Oaks data (**figure 3.3**) is that as there is a relatively large separation between the unflooded and flooded housing's prices (15% to 40%), the more expensive housing has remained unflooded whereas relatively cheaper housing has been flooded. Linking to the idea of decreasing demand due to **tastes and preferences**, prices of housing that have been flooded has decreased as it is less desirable to buy housing that has and will be more prone to flooding. People are less willing to buy this housing; thus, prices have decreased. For housing that hasn't flooded, prices have slowly increased, but there has been no significant increase in price before and after Hurricane Harvey. This indicates that the demand pattern shown in **figure 1.1** where prices of unflooded houses have increased due to greater demand hasn't occurred.

Figure 3.4: Pasadena average house price of flooded vs not flooded housing from **table 7** in appendix.
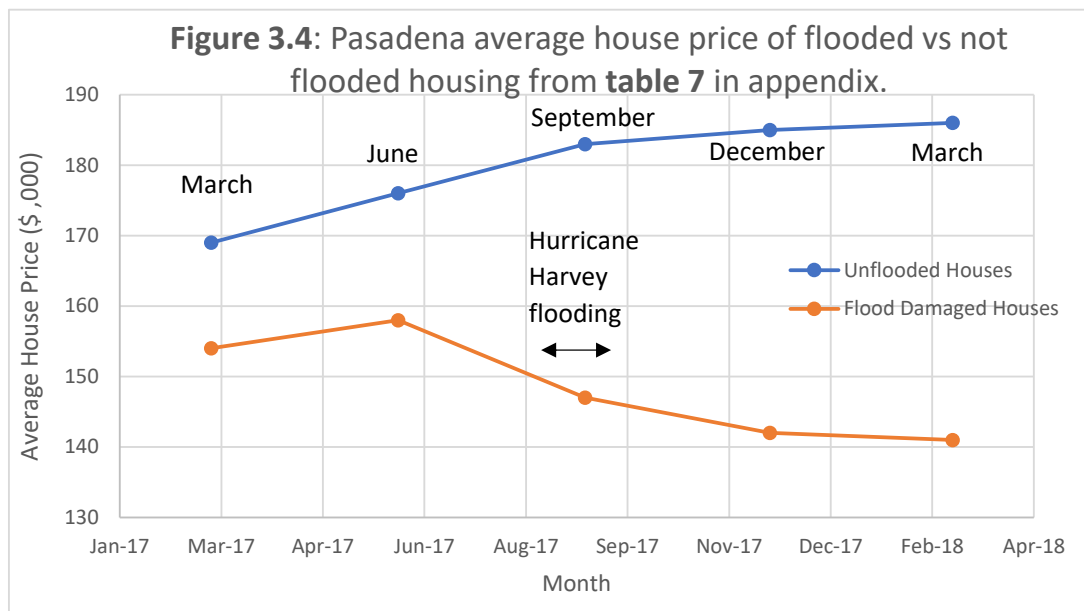
Like most of the other data samples, the flooded housing's prices have decreased over time whereas the unflooded housing's prices have increased for Pasadena (**figure 3.4**). Looking at **figure 1.1** and **figure 1.2**, the reason for the decrease in the prices of flooded housing could be due to changing **preferences and tastes**. The consumers of housing are less willing to buy housing that is more susceptible to flooding as more money is needed to repair and protect it, thus this housing isn't cost-effective to buy and maintain. The demand curve for flooded housing shifts inwards as a result (**figure 1.2**), consequently, price falls.

For unflooded housing, the opposite has occurred; their prices have increased. However, there is no gradient increase after the Hurricane, indeed the gradient is slightly lower thus showing slight decrease in the rate of house price increase. House prices have to be consistently increasing in the timeframe of my data analysis, and it is not clear that house price decreases are due to Harvey.

Figure 3.5: Memorial average house price of flooded vs not flooded housing from **table 8** in appendix.
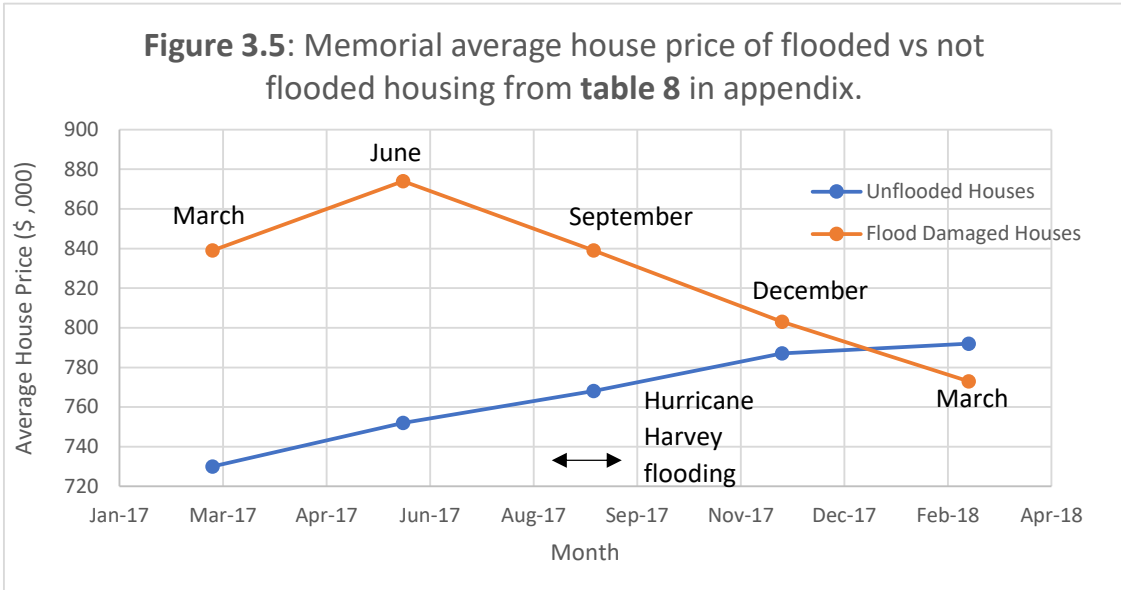
The obvious trend for the Memorial data (**figure 3.5**) is that the flooded housing's prices have dropped whereas the unflooded housing's prices increased. However, as neither of the two data's gradients have changed before and after Hurricane Harvey, it cannot be said with confidence that Harvey caused the price decreases and increases. Though, generally, house prices have changed due to altering demand. As seen at the start of this data that unflooded housing's prices were lower than the eventually flooded houses, it can be interpreted that the demand for relatively cheaper housing has increased rather than the increasing demand for unflooded housing. In addition, as in general, flooded housing's prices are higher than unflooded housing, it can be postulated that the reason for the price decrease was due to decreasing demand for expensive housing rather than decreasing demand for flooded housing, as the gradient after Harvey was the same as before it. By early 2018, prices for flooded and unflooded homes had converged and were similar.

Figure 3.6: Houston average house price of flooded vs not flooded housing from **table 9** in appendix.
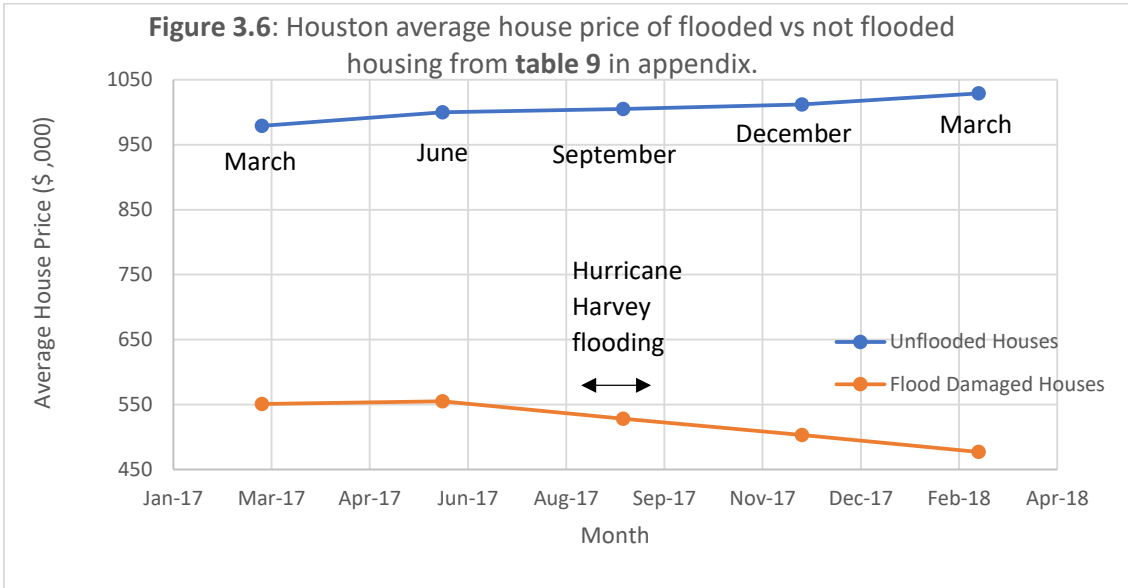
For Houston in general (**figure 3.6**), flooded housing's prices have decreased and unflooded housing's prices have increased. Although there isn't a sudden drop in the prices of this housing, the fact that there is a clear difference between flooded and unflooded homes' data trends shows that a market failure could have occurred as a result of Hurricane Harvey.

Figure 1.1 shows how increasing demand results in prices increasing, which corresponds to unflooded homes' prices increasing as seen in **figure 3.6**. The overall demand for these unflooded homes in Houston may have increased because they are less likely to flood and thus need less investment to protect them and to repair damage. Therefore, consumers are more willing to buy this housing and the demand curve for these homes shifts outwards, so there is a greater quantity consumed and the price increases.

Table 1- Amount of rainfall over Houston during Hurricane Harvey.

	Rainwater level (inches)				
Location	26th August 2017	27th August 2017	28th August 2017	29th August 2017	Total
Meyerland	3.20	17.52	8.04	5.00	33.76
Cinco Ranch	5.60	10.08	13.28	3.28	32.24
River Oaks	3.04	16.40	8.32	4.92	32.68
Pasadena	4.99	19.88	8.84	8.29	42.00
Memorial	4.57	15.91	10.55	4.00	35.03

For the Memorial and Pasadena neighbourhoods, there were three flood gauges and averages were taken to find mean levels of rainfall for each area (sample calculations below, using Pasadena as an example).

Sample calculations for table 1; the flood data table:

Pasadena (27th August):

Pasadena $_{average}$ = $\sum_{r=1}^{3} Pasadena_r$ = $\dfrac{Pasadena_1 + Pasadena_2 + Pasadena_3}{number\ of\ gauges\ (3)}$

Pasadena $_{average}$ = $\dfrac{19.52 + 21.08 + 19.04}{3}$ = 19.88 (inches).

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iii- *Heat Maps:*

I calculated percentage changes in house prices across each neighbourhood and used heat maps to illustrate and identify trends- see **figures 3.7 – 3.11**.

Table 2: Colours illustrating the various percentage changes in house prices from June 2017 to December 2017.

Percentage change in house price	Colour
- 40.01 and below	
Down to - 40	
Down to - 24	
Down to - 14	
Down to - 5	
0	
Up to + 5	
Up to + 14	
Up to + 24	
Up to + 40	
+ 40.01 and above	

Sample calculations for percentage changes in house prices between June and December:

$$\Delta\% = \frac{Final\ price - initial\ price}{initial\ price} \times 100$$

(prices in $1,000)

Sample calculation for 13131 Boheme in Memorial:

$$\Delta\% = \frac{602 - 621}{621} \times 100$$

$$\Delta\% = -3.06\% \ (2\ significant\ figures).$$

Figure 3.7: A heat map to show the general percentage changes in housing prices in Meyerland. Note the decreasing house price trend along Brays Bayou.
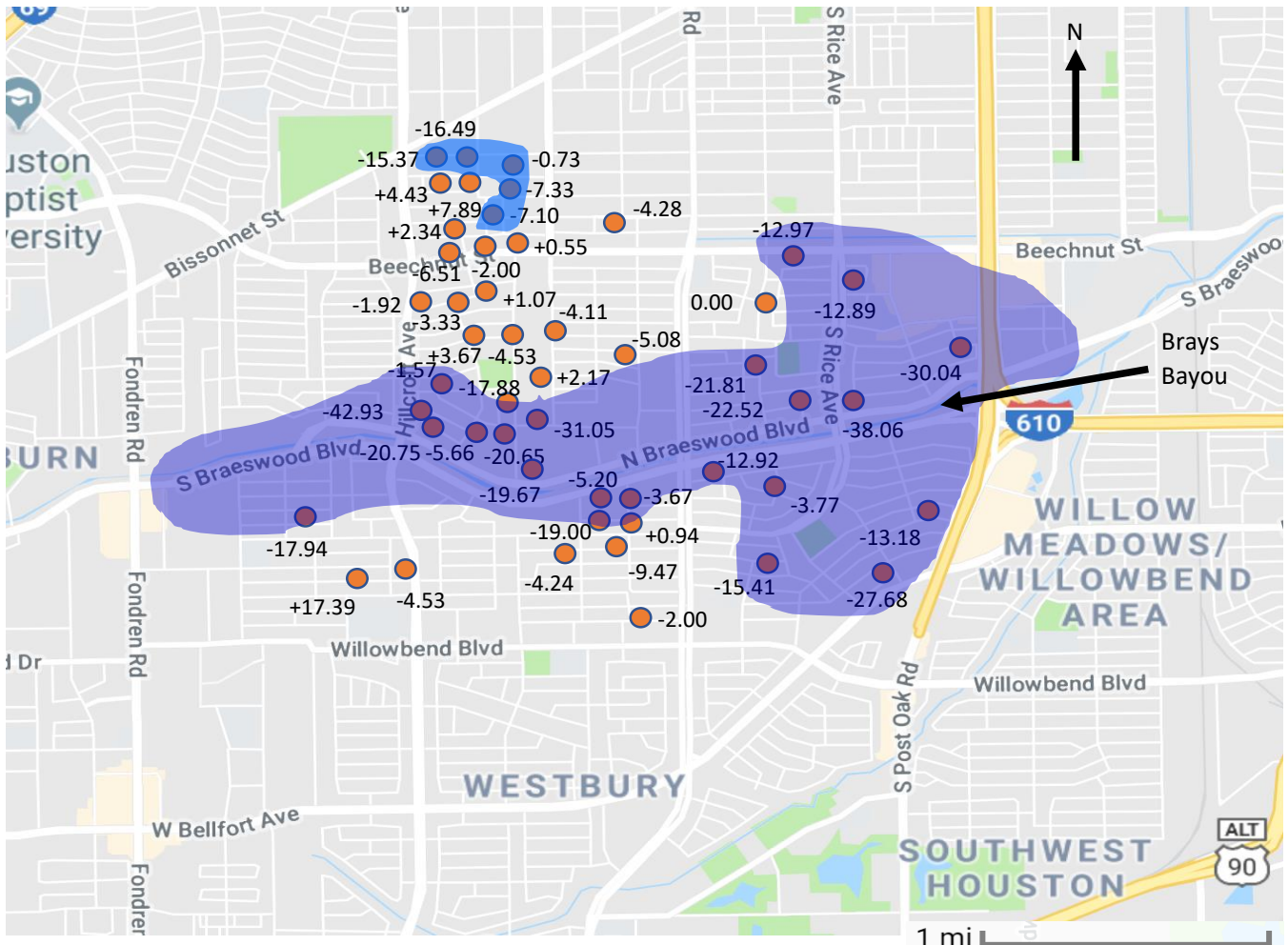
Figure 3.8: Heat map to show the general percentage changes in housing prices in Cinco Ranch. Note the decreasing house price trend to the south in the area of most lakes and rivers- lower lying land.

Percentage change in house price	Colour
- 40.01 and below	
Down to - 40	
Down to - 24	
Down to - 14	
Down to - 5	
0	
Up to + 5	
Up to + 14	
Up to + 24	
Up to + 40	
+ 40.01 and above	

Figure 3.9: Heat map to show the general percentage changes in housing prices in River Oaks. No obvious trends are identifiable.

Figure 3.10: Heat map to show the general percentage changes in housing prices in Pasadena. The trends in house price changes are discernible; there are more areas of house price increases than decreases.

Percentage change in house price	Colour
- 40.01 and below	
Down to - 40	
Down to - 24	
Down to - 14	
Down to - 5	
0	
Up to + 5	
Up to + 14	
Up to + 24	
Up to + 40	
+ 40.01 and above	

Percentage change in house price	Colour
- 40.01 and below	
Down to - 40	
Down to - 24	
Down to - 14	
Down to - 5	
0	
Up to + 5	
Up to + 14	
Up to + 24	
Up to + 40	
+ 40.01 and above	

Figure 3.11: Heat map to show the general percentage changes in housing prices in Memorial. Note the strong trend in house price decrease along the Buffalo Bayou.
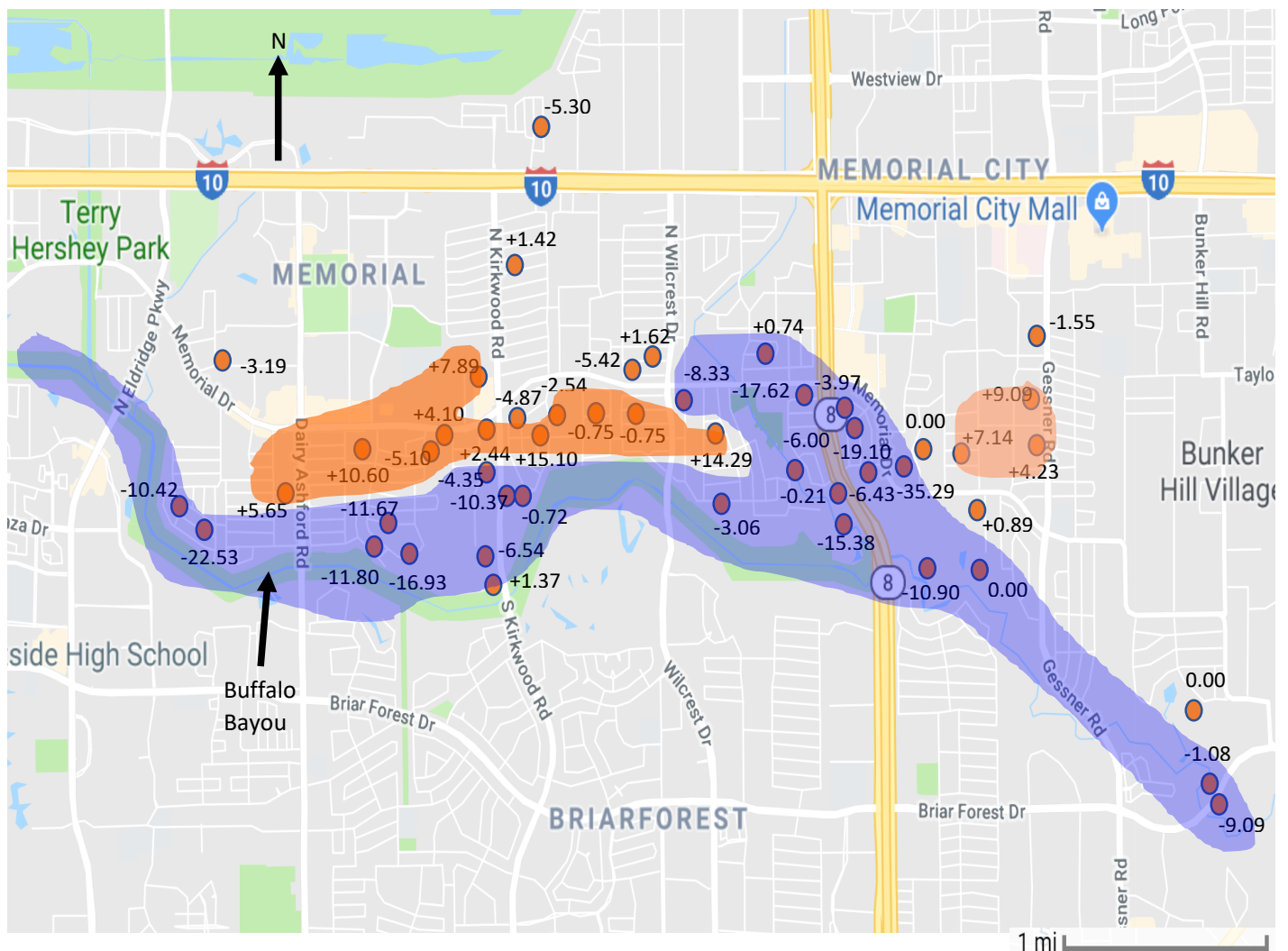
Figure 3.12- a collated diagram of **figures 3.7 – 3.11** onto a floodplain map[10] of the Greater Houston area.

Figure 3.10 Pasadena

Figure 3.8 River Oaks

Figure 3.7 Meyerland

Figure 3.11 Memorial

Figure 3.9 Cinco Ranch

Percentage change in house price	Colour
- 40.01 and below	
Down to - 40	
Down to - 24	
Down to - 14	
Down to - 5	
0	
Up to + 5	
Up to + 14	
Up to + 24	
Up to + 40	
+ 40.01 and above	

Legend

Floodplain Data

Effective FIRM (1/6/2017)

500 Delta

	At or Above 500 (Hollow)
	0 - 1
	1 - 2
	2- 3
	3 - 4
	4 - 5
	>5
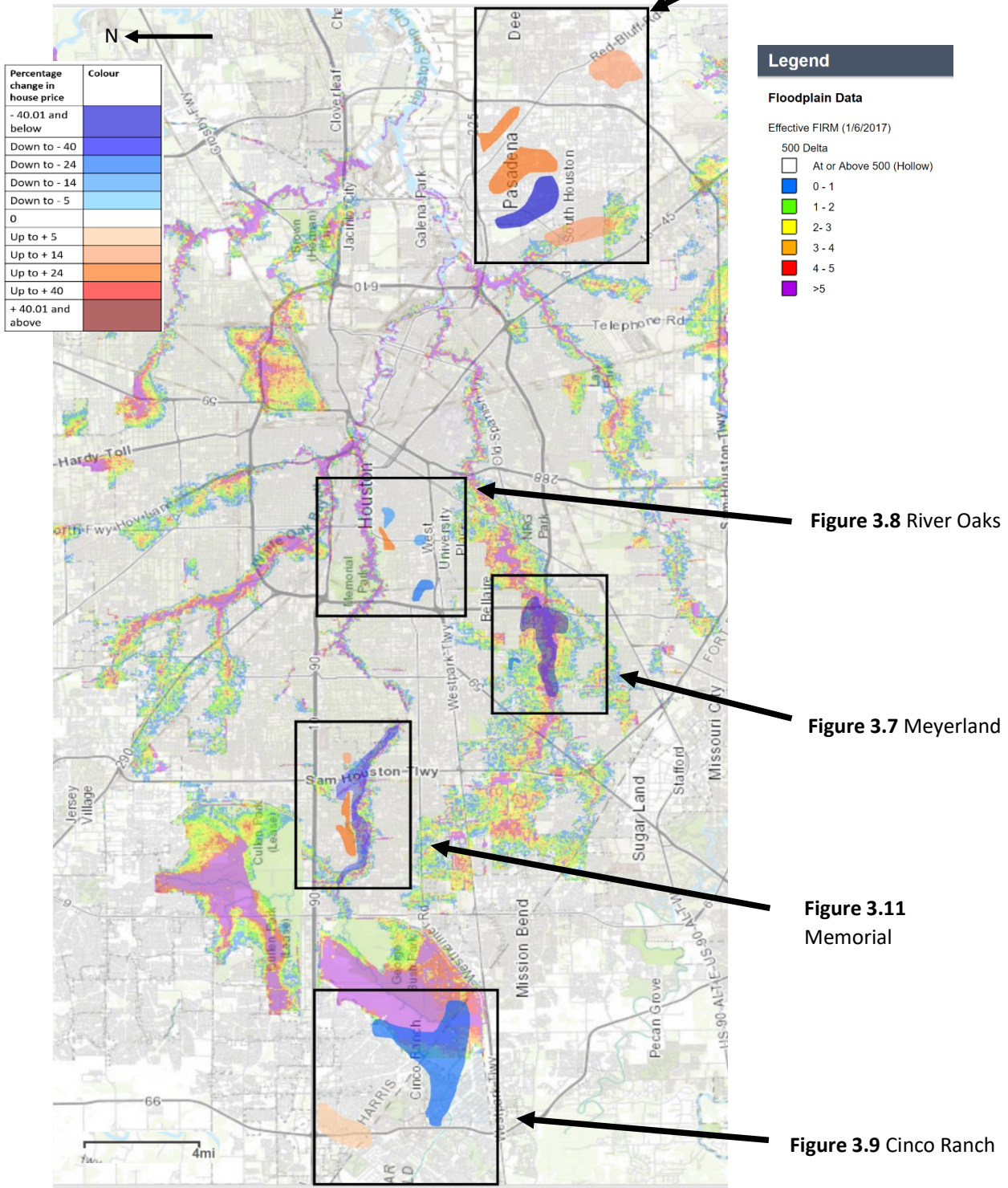
As seen in the Meyerland heat map (**figure 3.7**), largest areas of house price decreases were those closest to Brays Bayou. Although there were spots of house price increases, the general trend is that house prices in Meyerland decreased. As Meyerland was badly affected by the Hurricane, it can be interpreted that there was less demand for housing here as buyers are not willing to purchase housing that has a higher likelihood of flooding compared to other areas where flood risk is lower.

In Cinco Ranch, there is reasonable correlation between percentage of house price decrease and areas near Buffalo Bayou, particularly seen in the bottom right of the figure where a high concentration of houses that had a decrease in their prices were located. The areas where the house prices increased were to the north of Cinco Ranch in areas where there was no water nearby.

For River Oaks (**figure 3.8**), there was no obvious correlation. The River Oaks area barely flooded, so the data from this area will not show a strong correlation of house prices with flooding. There were isolated 'hotspots' of negative changes in house prices. However, there is no discernible trend with only small changes generally observed.

Pasadena (**figure 3.10**) did not have much of a correlation. There were few obvious trends there, with roughly the same number of houses increased and decreased in price.

The Memorial area (**figure 3.11**) demonstrates that the largest percentage decreases in house prices are along the Buffalo Bayou. There is a strong trend in house price decrease along the Bayou. There were also spots of house price percentage increases, moving away from the Bayou to the north.

Figure 3.12 shows that Pasadena, Meyerland, Cinco Ranch and Memorial fit the trend of house prices being linked to flooding. Meyerland had a large percentage decrease in house prices as it is on land which regularly floods, and Memorial fits this same trend along the Buffalo Bayou. Cinco Ranch's data also fits the trend as there is a large area to its east which regularly floods. Pasadena has historically remained relatively dry compared to the other areas, which is why there are

generally house price increases. River Oaks doesn't have an obvious trend as there are random spots of price increases and decreases.

<div align="center">

iv- *Spearman rank-order correlation:*

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In order to test the observed correlation between the amount of rainfall and house prices, a correlation method was used to evaluate a quantitative relationship between these two variables, for all five areas combined. The percentage change in average house prices from June to December 2017 were used (**table 3**).

Null hypothesis: There is some weak positive correlation between percentage change in house prices before and after Harvey and flood levels.

Sample calculations for table 3:

To find the percentage change in house price for Memorial:

$$\% \, \Delta = \frac{Initial \; price \; (in \; \$,000) - Price \; after \; Harvey \; (in \; \$,000)}{Initial \; price \; (in \; \$,000)} \; X \; 100$$

$$\% \, \Delta \; (Memorial) = \frac{874 \; (in \; \$,000) - 803 \; (in \; \$,000)}{874 \; (in \; \$,000)} \; X \; 100$$

= 8.12 %.

Table 3: Shows the rank orders of the percentage change in house prices of *flooded houses* as well as rainfall levels.

Location	Percentage change in house prices from June to December	Rank of percentage change in house prices	Rainfall level (inches)	Rank of flood level	Difference between ranks (d)	d^2
Meyerland	15.48	1	33.76	3	-2	4
River Oaks	8.77	3	32.24	5	-2	4
Cinco Ranch	4.23	5	32.68	4	1	1
Pasadena	10.13	2	42.00	1	1	1
Memorial	8.12	4	35.03	2	2	4

Using the equation below, the correlation between rainfall and changes in house prices was quantitatively measured. Numbers closest to + 1 means there is a strong positive correlation whereas positive numbers closest to 0 mean there is a weak positive correlation. Numbers closest to − 1 mean there is a strong negative correlation.

$$(R) = 1 - \frac{6 \sum d^2}{n^3 - n}$$

$\Sigma d^2 = 14$

$n = 5$

To find the rank order coefficient:

$$R = 1 - \frac{6\,(14)}{5^3 - 5}$$

R = 0.3, thus there is weak correlation between percentage changes in house prices and flood water levels. Thus, the null hypothesis is valid.

V- Evaluation:

One of the main assumptions of the theory was that the key cause of house price decreases across Houston was changes in demand; the only factors considered to affect this demand were **consumer confidence** as well as **preferences and tastes**. As the quantitative correlation method confirmed there was weak correlation with rainfall, it cannot be stated with full confidence that the housing market before and after Harvey was affected due to changing consumer confidence due to flooding, as well as a consumer preference for unflooded housing, thus greater demand for this housing and its price increases; flooded homes' prices would have decreased. There was also bias in the sampling as only fifty houses were randomly chosen from each neighbourhood. However, as average house prices were used, potential bias was reduced.

Meyerland's house prices (**figure 3.1**), against the general Houston trend, may have decreased due to prior flooding. As their percentage change in house price was greatest, it shows potential weaknesses of the quantitative correlation generated through this research. The most notable floods that have deeply affected Meyerland were the Tax Day Flood in April 2016, as well as the Memorial Day Flood in May 2015. As this was a stand-out data point, this shows the limitations of the method of correlation (**table 3**). While quantitative analysis (**table 3**) shows only a weak correlation between house price changes and Harvey, qualitative heat maps (**figure 3.7 – 3.11**) shows trends along the bayous/rivers.

VI- Conclusions:

In general, Hurricane Harvey affected the housing market in various ways, specifically, different conditions of houses had their prices changed due to Harvey. The data, without the correlation method, suggested that there was an overall decrease in average prices of flooded homes (**figure 3.6**) for Houston in general. For each specific neighbourhood, prices of flooded housing also decreased, thus there was evidence of price decreases due to changing **consumer confidence** and **preferences and tastes**.

As there was some positive correlation established between flood levels and house prices, it can be said that prices of flooded houses have decreased as a result of Hurricane Harvey. Additionally, as established through **figures 3.1** to **3.6**, it can be said that as a result of Harvey, prices of unflooded housing have increased.

There is a limitation to the validity of the data gathered through this with the data sample of fifty houses per neighbourhood being too small, as it does not utilise hundreds of houses in total around Houston.

One main conclusion that can be made from **figure 3.6** is that prices of flooded housing were much cheaper on average than that of unflooded homes. The areas least affected, an example being River Oaks, were located on slightly higher land. This higher elevation land is more expensive as it offers a natural protection to floods and rainfall. Areas such as Meyerland and Memorial, which were badly affected by Harvey, are next to major bayous, thus they are more likely to flood than other housing. Linking this to the data, these areas both experienced 15.48% and 8.12% change in their prices before and after Harvey (**table 8**), thus quantifiably, the fact that **consumer confidence** decreases, as these homes are more likely to flood is reflected by an inwards shifting demand curve and house prices consequently decrease.

However, part of the market asymmetry has been rectified; housing on Zillow and other real estate websites now include whether houses have flooded; consumers have started to become more aware of areas prone to flooding. The more information each party knows, whether it is the consumers, house owners or insurance companies, the better. This limits the risk of moral hazard, as insurance companies will likely not offer flood insurance for housing that is more likely to flood. Though, there will never exist perfect information in the housing market as humans cannot control the weather; there will always be a chance, however unexpected (particularly with climate change), that there will be flooding.

VII- Bibliography:

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VIII- Appendix:

Table 4- Meyerland:

	Price ($,000)					
Meyerland	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	% change
8102 Mullins	360	366	340	340	387	-7.10
5625 Pine	593	553	511	468	464	-15.37
5605 Pine	594	552	512	461	451	-16.49
5512 Valerie	673	681	662	676	686	-0.73
5642 Flack	365	361	363	377	379	4.43
5620 Flack	355	355	352	383	395	7.89
5526 Holly	478	505	499	468	491	-7.33
5634 Hazen	881	899	910	920	944	2.34
5647 Edith	333	307	313	287	288	-6.51
5602 Beechnut	305	300	306	294	283	-2.00
5554 Beechnut	371	366	358	368	373	0.55
5603 Beechnut	278	280	288	283	317	1.07
5615 Carew	480	481	475	465	450	-3.33
5738 Darnell	345	312	308	306	307	-1.92
5702 Jackwood	469	463	466	480	480	3.67
5530 Ariel	320	287	274	274	272	-4.53
5531 Ariel	307	292	282	280	276	-4.11
5726 Kuldell	422	446	452	439	423	-1.57
5506 Kuldell	296	277	280	283	283	2.17
9014 Mullins	336	330	315	271	271	-17.88
5723 Cheltenham	389	396	381	226	212	-42.93
5623 Braesvalley	322	310	302	246	224	-20.65
5622 Braesvalley	730	725	705	684	690	-5.66
5522 Braesvalley	318	306	303	211	210	-31.05
5528 Shadow Crest	349	361	328	290	263	-19.67
5727 Reamer	331	318	301	252	244	-20.75
5539 Queensloch	403	421	368	341	365	-19.00
5523 S Braeswood	481	481	480	456	456	-5.20
9702 Checkerboard	412	409	414	394	392	-3.67
9711 Burdine	427	424	427	428	420	0.94
9003 Prichett Dr	449	444	439	344	344	-22.52
8903 Ferris	431	431	411	337	298	-21.81
5030 N Braeswood	660	670	484	415	424	-38.06
4926 Yarwell	361	349	327	303	324	-13.18
4703 Jason	468	446	445	312	296	-30.04
5011 Darnell	831	807	776	703	658	-12.89
5126 Carew	534	555	517	483	475	-12.97
5443 Lymbar Dr	398	401	401	393	381	-2.00
5003 Lymbar Dr	352	354	254	256	266	-27.68

5444 Rutherglenn Dr	430	433	423	392	375	-9.47
5906 Yarwell	394	397	388	379	369	-4.53
5602 Dumfries	414	401	387	384	377	-4.24
5234 Yarwell	605	545	528	461	413	-15.41
5319 S Braeswood	549	542	518	472	452	-12.92
5211 Braesheather	708	742	685	714	700	-3.77
8626 Pritchett	1100	1100	1100	1100	1000	0.00
5429 Edith	800	701	700	671	664	-4.28
6122 Queensloch	376	379	361	311	312	-17.94
6015 Yarwell	322	322	305	378	355	17.39
5427 Ariel	418	453	452	430	449	-5.08
Sum	23323	23036	22176	20889	20628	
Average	466	461	444	418	413	

Table 5- Cinco Ranch:

	Price ($,000)					
Cinco Ranch	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	% change
21415 Ganton	444	448	434	425	391	-5.13
4515 Candlewood	535	521	509	523	520	0.38
2235 Enchanted Park	261	261	258	259	264	-0.77
2606 Morganfair	1400	1500	1400	1400	1400	-6.67
3015 Gilford	228	237	241	244	244	2.95
4511 Summits Edge	606	615	579	570	594	-7.32
4310 Leaflock	406	415	402	397	396	-4.34
4202 Stonecroft	428	413	413	419	419	1.45
22830 Roberts Run	433	439	436	434	434	-1.14
3918 Diamondale	326	325	316	320	324	-1.54
22510 Crownfield	282	288	285	286	287	-0.69
22118 Haden Park	386	377	367	367	368	-2.65
3619 Brinton Trails	325	332	315	302	302	-9.04
22518 Sail Harbour	331	332	329	322	352	-3.01
3314 Clear Water Park	427	436	436	436	436	0.00
4019 Sand Ter	267	271	265	255	247	-5.90
3511 Pedernales Trails	243	249	251	241	227	-3.21
21011 Kelliwood Arbor	577	559	526	506	491	-9.48
20411 Wild View	217	198	199	187	184	-5.56
20510 Indian Grove	242	244	229	216	208	-11.48
2907 Canyonview	224	211	210	210	210	-0.47
20702 Smokey Sage	255	257	259	260	260	1.17
2507 Kelliwood Lakes	464	460	452	450	472	-2.17
2606 Ivy Run	1400	1500	1500	1500	1500	0.00
2606 Silverhorn	1100	1100	1100	1100	1100	0.00
20406 Chadbury Park	339	339	341	329	321	-2.95

2014 Amber Glen	301	299	299	310	320	3.68
24906 Misty Heath	901	918	910	908	885	-1.09
1710 Octillo	281	275	279	282	290	2.55
24507 Red Bluff	323	320	322	327	331	2.19
24707 High Bridge	324	330	337	342	350	3.64
2702 Autumn Lake	627	643	662	675	641	4.98
3122 N Saddlebrook	583	604	805	1100	1100	82.12
3314 Baden Oaks	308	292	278	273	269	-6.51
2403 Blue Water Bay	367	361	351	354	372	-1.94
2110 Shadow Park	309	301	299	300	309	-0.33
1603 S Warmstone	318	319	317	319	324	0.00
22010 Shady Valley	190	195	199	198	199	1.54
1527 Carstone	221	218	218	217	219	-0.46
22931 Indian Ridge	174	176	180	181	179	2.84
923 Arrow Lake	150	156	157	158	153	1.28
22110 Deville	169	174	176	179	181	2.87
4106 Spyglass Hills	472	476	471	470	474	-1.26
21323 Kelliwood Greens	573	575	563	559	541	-2.78
21206 Willowford Park	359	363	361	348	341	-4.13
22415 Caroline Cove	328	335	330	272	281	-18.81
4814 Stackstone	369	379	386	372	375	-1.85
22007 Katie Ridge	484	485	487	490	460	1.03
5002 Barlow Bend	654	674	657	644	605	-4.45
21019 Kelliwood Grove	410	412	410	397	397	-3.64
Sum	21341	21607	21506	21633	21547	
Average	427	432	430	433	431	

Table 6- River Oaks:

River Oaks	Mar-17	Jun-17	Price ($,000) Sep-17	Dec-17	Mar-18	% change
1708 River Oaks	7900	7900	8000	8000	8000	1.27
2507 Locke	1200	1700	1600	1500	1400	-11.76
3109 Locke	2900	2900	3000	3000	3000	3.45
2504 Avalon	1100	1100	1100	1100	1100	0.00
2310 Peckham	996	993	1000	995	985	0.20
3606 Ella Lee	3800	3800	4500	4500	4500	18.42
6026 Glencove	2200	2200	2200	2200	2200	0.00
75 Briar Hollow	1000	1000	1100	1100	1100	10.00
5912 Community	746	709	754	796	853	12.27
2708 Colquitt	807	817	817	801	698	-1.96
5312 Buffalo	518	498	507	499	492	0.20
4122 W Northampton	496	498	489	491	499	-1.41

1929 Sharp	3500	2900	2500	2600	1700	-10.34
2218 Driscoll	992	980	974	1000	964	2.04
6008 Glencove	848	840	845	827	837	-1.55
2904 Suffolk	1400	1400	1400	1400	1500	0.00
3311 Drexel	960	959	938	947	1100	-1.25
4402 Ingersoll	1200	1200	1100	1000	1100	-16.67
4507 Shetland	1900	2000	2000	2000	1900	0.00
3122 Kettering	1400	2000	1800	1800	1700	-10.00
3315 Banbury	1300	1400	1400	1400	1400	0.00
3247 Inwood	3300	3300	3500	3500	3500	6.06
2435 Stanmore	2100	2100	2000	2100	2200	0.00
2232 Looscan	1300	1400	1400	1400	1500	0.00
3024 Del Monte	2800	2800	2900	2900	2900	3.57
2240 Inwood	3300	3300	3800	4100	3600	24.24
2149 Stanmore	1400	1400	1400	1400	1400	0.00
2223 Del Monte	2300	2300	2200	2200	3900	-4.35
1059 Kirby	2900	2900	2800	2700	3000	-6.90
3717 Willowick	4000	4100	4100	4100	4100	0.00
3229 Groveland	5300	5300	6000	6300	6300	18.87
1216 S Shepherd	902	875	838	850	1100	-2.86
36 Tiel Way	3500	3200	3000	3100	2900	-3.13
1000 Kirby	9300	9300	9400	9400	9400	1.08
908 S Shepherd	473	479	482	477	579	-0.42
305 Birdsall	677	685	692	692	767	1.02
224 E Cowan	2000	2000	2000	2100	2100	5.00
3642 Inverness	3900	3800	3600	3400	3400	-10.53
1017 Gross	404	415	416	416	418	0.24
3207 Sackett	1400	1700	1600	1600	1600	-5.88
1812 Driscoll	617	598	552	553	638	-7.53
2129 Del Monte	1500	1600	1600	1600	1500	0.00
2148 Looscan	2400	3100	3400	3300	3500	6.45
2003 Vermont	581	615	571	552	553	-10.24
1515 Woodhead	1600	1600	1500	1500	1500	-6.25
1614 Morse	1200	1200	1200	1200	1300	0.00
2233 Troon	4400	4500	4300	4300	4300	-4.44
3741 Inwood	3600	3800	3800	3800	3800	0.00
24 Crestwood	3300	3200	2900	2900	3000	-9.38
63 W Terrace	1400	1300	1300	1300	1700	0.00
Sum	109017	110661	111275	111696	113483	
Average	2180	2213	2226	2234	2270	

Table 7- Pasadena:

Pasadena	Price ($,000)					% change
	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	
1809 Brenda	121	127	135	135	135	6.30
3012 Briar	137	142	143	148	151	4.23
3521 Tanglebriar	121	128	133	136	146	6.25
515 Burke	96	99	105	113	111	14.14
1211 Dogwood	89	94	100	103	111	9.57
1117 Lafferty	108	110	113	115	118	4.55
1709 Nottingham	130	136	132	131	128	-3.68
1213 Aberdeen	85	106	122	118	121	11.32
1705 Oaks	251	262	144	145	147	-44.66
2114 Oaks	127	137	132	134	103	-2.19
1205 Maplewood	128	130	131	125	120	-3.85
302 Elm	68	68	77	80	82	17.65
308 Bearle	103	111	108	113	116	1.80
1410 Susan	79	84	86	64	73	-23.81
2818 Thomas	128	132	131	135	133	2.27
2013 Nottingham	131	135	120	114	128	-15.56
2214 Rosemead	122	133	135	127	126	-4.51
2109 Pomona	104	109	103	101	107	-7.34
3010 Earl	102	113	101	110	106	-2.65
3715 Meadowlake	93	91	89	86	69	-5.49
2606 Mill Creek	154	145	142	143	146	-1.38
1706 Parkside	130	136	137	142	143	4.41
618 Fox Hollow	308	299	295	291	287	-2.68
4008 Chile	292	351	357	362	370	3.13
4230 Fox Meadow	392	414	427	425	418	2.66
4003 Paraguay	286	304	331	329	344	8.22
4218 Brazil	241	253	271	272	273	7.51
4122 Rancho Vista	468	475	468	455	451	-4.21
5019 Colombia	183	190	185	185	186	-2.63
3518 Dry Creek	262	263	272	273	279	3.80
6115 Canada	164	171	175	177	180	3.51
5919 Birdie	255	266	262	265	263	-0.38
6615 Elmscott	258	265	271	273	275	3.02
6503 Saint Jude	247	255	260	267	260	4.71
5114 Scottline	245	256	254	255	244	-0.39
4302 Arboretum	262	271	287	290	290	7.01
4207 Blue Water	181	183	263	284	287	55.19
6503 Fairbourne	170	177	184	187	189	5.65
4231 Bermuda	135	133	126	110	106	-17.29
2222 Lamina	85	86	94	91	95	5.81
2301 Wayside	192	199	202	199	198	0.00
128 W 6th	125	127	121	122	126	-3.94
1710 Tulsa	177	188	187	188	189	0.00

413 Pecan	110	114	115	117	116	2.63
663 Marleen	123	126	126	128	134	1.59
5210 Laura Lee	247	241	252	255	241	5.81
727 Gilpin	106	108	113	107	101	-0.93
3441 Hickory	169	173	178	182	185	5.20
901 James	133	132	135	139	143	5.30
8203 Tarbell	134	139	142	145	154	4.32
Sum	8557	8887	8972	8991	9004	
Average	171	178	179	180	180	

Table 8- Memorial:

	Price ($,000)					
Memorial	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	% change
14115 River Forest	715	780	769	729	619	-6.54
14102 Bluebird	2400	2300	2200	2200	1700	-4.35
531 Woodbend	928	945	959	847	791	-10.37
14111 Heatherfield	517	510	490	517	478	1.37
503 Ramblewood	823	832	796	826	857	-0.72
14023 Taylorcrest	566	558	635	602	587	7.89
13734 Tosca	776	786	791	766	771	-2.54
620 Wren	691	698	709	715	767	2.44
630 Ramblewood	719	760	769	723	778	-4.87
14214 Chadbourne	553	549	553	521	538	-5.10
14407 Chadbourne	684	689	784	762	754	10.60
13619 Alchester	788	798	832	792	848	-0.75
627 Rancho Bauer	460	463	476	482	449	4.10
13915 Kingsride	972	986	997	1000	1000	1.42
1306 W Forest	415	415	411	393	394	-5.30
14859 Perthshire	438	439	436	425	397	-3.19
13111 Apple Tree	1300	1400	1600	1600	1500	14.29
13131 Boheme	605	621	628	602	586	-3.06
620 Stoneleigh	836	828	997	953	961	15.10
323 Isolde	1200	1300	1200	1100	1000	-15.38
322 Isolde	467	477	486	476	470	-0.21
327 Electra	817	834	836	784	865	-6.00
13515 Taylorcrest	630	646	614	611	614	-5.42
13514 Alchester	793	802	804	796	810	-0.75
426 N Wilcrest	1200	1200	1100	1100	1100	-8.33
12919 Memorial	471	579	511	477	504	-17.62
13315 Pebblebrook	672	677	681	688	695	1.62
13026 Taylorcrest	599	680	673	685	709	0.74
14619 Carolcrest	505	496	520	524	503	5.65
14834 Oak Bend	482	480	494	430	433	-10.42
318 Kickerillo	588	573	563	476	612	-16.93

431 Kickerillo	572	534	531	471	479	-11.80
14339 River Forest	668	660	637	583	591	-11.67
14811 Oak Bend	467	475	484	368	366	-22.53
12303 Mossycup	699	710	727	740	743	4.23
12510 Boheme	1400	1400	1400	1500	1600	7.14
12441 Cobblestone	897	931	914	1600	1500	71.86
403 Hollow	1200	1700	1300	1100	1100	-35.29
111 Paul Revere	1200	1200	1200	1200	1100	0.00
9011 Briar Forest	427	463	472	458	451	-1.08
38 Sandalwood	1500	1700	1700	1700	1800	0.00
39 Hudson	1100	1100	1100	1000	1200	-9.09
311 Paul Revere	888	900	928	908	873	0.89
12311 Cobblestone	1100	1100	1100	1200	1100	9.09
12307 Woodthorpe	649	645	632	635	639	-1.55
64 Legend	432	468	444	417	350	-10.90
12601 Boheme	1200	1300	1300	1300	1200	0.00
415 Mignon	497	504	508	484	475	-3.97
12707 Memorial	529	544	553	509	484	-6.43
12735 Memorial	527	644	566	521	524	-19.10
Sum	39562	41079	40810	40296	39665	
Average	791	822	816	806	793	

Table 9- Houston unflooded:

	Price ($,000)				
Houston	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18
8102 Mullins	360	366	340	340	387
5625 Pine	593	553	511	468	464
5620 Flack	355	355	352	383	395
5526 Holly	478	505	499	468	491
5634 Hazen	881	899	910	920	944
5647 Edith	333	307	313	287	288
5602 Beechnut	305	300	306	294	283
5603 Beechnut	278	280	288	283	317
5615 Carew	480	481	475	465	450
5530 Ariel	320	287	274	274	272
5531 Ariel	307	292	282	280	276
5443 Lymbar Dr	398	401	401	393	381
5444 Rutherglenn Dr	430	433	423	392	375
5906 Yarwell	394	397	388	379	369
5602 Dumfries	414	401	387	384	377
8626 Pritchett	1100	1100	1100	1100	1000
5429 Edith	800	701	700	671	664
6122 Queensloch	376	379	361	311	312
6015 Yarwell	322	322	305	378	355
5427 Ariel	418	453	452	430	449
4515 Candlewood	535	521	509	523	520
2235 Enchanted Park	261	261	258	259	264

2606 Morganfair	1400	1500	1400	1400	1400
3015 Gilford	228	237	241	244	244
4511 Summits Edge	606	615	579	570	594
4310 Leaflock	406	415	402	397	396
4202 Stonecroft	428	413	413	419	419
22830 Roberts Run	433	439	436	434	434
22510 Crownfield	282	288	285	286	287
22118 Haden Park	386	377	367	367	368
3619 Brinton Trails	325	332	315	302	302
22518 Sail Harbour	331	332	329	322	352
3314 Clear Water Park	427	436	436	436	436
20411 Wild View	217	198	199	187	184
20702 Smokey Sage	255	257	259	260	260
2507 Kelliwood Lakes	464	460	452	450	472
2606 Ivy Run	1400	1500	1500	1500	1500
2606 Silverhorn	1100	1100	1100	1100	1100
24906 Misty Heath	901	918	910	908	885
1710 Octillo	281	275	279	282	290
24507 Red Bluff	323	320	322	327	331
3122 N Saddlebrook	583	604	805	1100	1100
3314 Baden Oaks	308	292	278	273	269
1603 S Warmstone	318	319	317	319	324
1527 Carstone	221	218	218	217	219
22931 Indian Ridge	174	176	180	181	179
22007 Katie Ridge	484	485	487	490	460
5002 Barlow Bend	654	674	657	644	605
1708 River Oaks	7900	7900	8000	8000	8000
2507 Locke	1200	1700	1600	1500	1400
3109 Locke	2900	2900	3000	3000	3000
2504 Avalon	1100	1100	1100	1100	1100
6026 Glencove	2200	2200	2200	2200	2200
75 Briar Hollow	1000	1000	1100	1100	1100
5912 Community	746	709	754	796	853
2708 Colquitt	807	817	817	801	698
4122 W Northampton	496	498	489	491	499
2218 Driscoll	992	980	974	1000	964
6008 Glencove	848	840	845	827	837
2904 Suffolk	1400	1400	1400	1400	1500
3311 Drexel	960	959	938	947	1100
4402 Ingersoll	1200	1200	1100	1000	1100
4507 Shetland	1900	2000	2000	2000	1900
3122 Kettering	1400	2000	1800	1800	1700
3315 Banbury	1300	1400	1400	1400	1400
3247 Inwood	3300	3300	3500	3500	3500
2435 Stanmore	2100	2100	2000	2100	2200
2232 Looscan	1300	1400	1400	1400	1500
3024 Del Monte	2800	2800	2900	2900	2900
2240 Inwood	3300	3300	3800	4100	3600

2149 Stanmore	1400	1400	1400	1400	1400
2223 Del Monte	2300	2300	2200	2200	3900
1059 Kirby	2900	2900	2800	2700	3000
3717 Willowick	4000	4100	4100	4100	4100
3229 Groveland	5300	5300	6000	6300	6300
1216 S Shepherd	902	875	838	850	1100
36 Tiel Way	3500	3200	3000	3100	2900
1000 Kirby	9300	9300	9400	9400	9400
224 E Cowan	2000	2000	2000	2100	2100
3642 Inverness	3900	3800	3600	3400	3400
1017 Gross	404	415	416	416	418
3207 Sackett	1400	1700	1600	1600	1600
2129 Del Monte	1500	1600	1600	1600	1500
2148 Looscan	2400	3100	3400	3300	3500
2003 Vermont	581	615	571	552	553
1515 Wood	1600	1600	1500	1500	1500
1614 Morse	1200	1200	1200	1200	1300
2233 Troon	4400	4500	4300	4300	4300
3741 Inwood	3600	3800	3800	3800	3800
24 Crestwood	3300	3200	2900	2900	3000
63 W Terrace	1400	1300	1300	1300	1700
1809 Brenda	121	127	135	135	135
3521 Tanglebriar	121	128	133	136	146
515 Burke	96	99	105	113	111
1211 Dogwood	89	94	100	103	111
1117 Lafferty	108	110	113	115	118
1213 Aberdeen	85	106	122	118	121
1205 Maplewood	128	130	131	125	120
302 Elm	68	68	77	80	82
308 Bearle	103	111	108	113	116
2818 Thomas	128	132	131	135	133
3010 Earl	102	113	101	110	106
1706 Parkside	130	136	137	142	143
618 Fox Hollow	308	299	295	291	287
4008 Chile	292	351	357	362	370
4003 Paraguay	286	304	331	329	344
4218 Brazil	241	253	271	272	273
3518 Dry Creek	262	263	272	273	279
6115 Canada	164	171	175	177	180
5919 Birdie	255	266	262	265	263
6503 Saint Jude	247	255	260	267	260
5114 Scottline	245	256	254	255	244
4302 Arboretum	262	271	287	290	290
4207 Blue Water	181	183	263	284	287
6503 Fairbourne	170	177	184	187	189
4231 Bermuda	135	133	126	110	106
2222 Lamina	85	86	94	91	95
2301 Wayside	192	199	202	199	198

	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18
128 W 6th	125	127	121	122	126
1710 Tulsa	177	188	187	188	189
5210 Laura Lee	247	241	252	255	241
3441 Hickory	169	173	178	182	185
901 James	133	132	135	139	143
8203 Tarbell	134	139	142	145	154
14023 Taylorcrest	566	558	635	602	587
13734 Tosca	776	786	791	766	771
14214 Chadbourne	553	549	553	521	538
14407 Chadbourne	684	689	784	762	754
13619 Alchester	788	798	832	792	848
627 Rancho Bauer	460	463	476	482	449
13915 Kingsride	972	986	997	1000	1000
1306 W Forest	415	415	411	393	394
14859 Perthshire	438	439	436	425	397
620 Stoneleigh	836	828	997	953	961
13514 Alchester	793	802	804	796	810
12919 Memorial	471	579	511	477	504
13315 Pebblebrook	672	677	681	688	695
13026 Taylorcrest	599	680	673	685	709
14619 Carolcrest	505	496	520	524	503
12303 Mossycup	699	710	727	740	743
12441 Cobblestone	897	931	914	1600	1500
9011 Briar Forest	427	463	472	458	451
38 Sandalwood	1500	1700	1700	1700	1800
39 Hudson	1100	1100	1100	1000	1200
311 Paul Revere	888	900	928	908	873
12311 Cobblestone	1100	1100	1100	1200	1100
12307 Woodthorpe	649	645	632	635	639
Sum	143886	146997	147757	148692	151236
Average	979	1000	1005	1012	1029

Table 10- Houston flooded:

		Price ($,000)			
Houston	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18
5726 Kuldell	422	446	452	439	423
5506 Kuldell	296	277	280	283	283
9014 Mullins	336	330	315	271	271
5623 Braesvalley	322	310	302	246	224
5622 Braesvalley	730	725	705	684	690
5522 Braesvalley	318	306	303	211	210
5528 Shadow Crest	349	361	328	290	263
5523 S Braeswood	481	481	480	456	456

9702 Checkerboard	412	409	414	394	392
9003 Prichett Dr	449	444	439	344	344
8903 Ferris	431	431	411	337	298
5030 N Braeswood	660	670	484	415	424
4703 Jason	468	446	445	312	296
5126 Carew	534	555	517	483	475
5003 Lymbar Dr	352	354	254	256	266
5234 Yarwell	605	545	528	461	413
5319 S Braeswood	549	542	518	472	452
5211 Braesheather	708	742	685	714	700
21415 Ganton	444	448	434	425	391
4019 Sand Ter	267	271	265	255	247
3511 Pedernales Trails	243	249	251	241	227
21011 Kelliwood Arbor	577	559	526	506	491
20510 Indian Grove	242	244	229	216	208
2907 Canyonview	224	211	210	210	210
20406 Chadbury Park	339	339	341	329	321
24707 High Bridge	324	330	337	342	350
2110 Shadow Park	309	301	299	300	309
22010 Shady Valley	190	195	199	198	199
4106 Spyglass Hills	472	476	471	470	474
21323 Kelliwood Greens	573	575	563	559	541
21206 Willowford Park	359	363	361	348	341
22415 Caroline Cove	328	335	330	272	281
4814 Stackstone	369	379	386	372	375
21019 Kelliwood Grove	410	412	410	397	397
5312 Buffalo	518	498	507	499	492
1929 Sharp	3500	2900	2500	2600	1700
1709 Nottingham	130	136	132	131	128
1705 Oaks	251	262	144	145	147
2114 Oaks	127	137	132	134	103
1410 Susan	79	84	86	64	73
2013 Nottingham	131	135	120	114	128
2214 Rosemead	122	133	135	127	126
2109 Pomona	104	109	103	101	107
3715 Meadowlake	93	91	89	86	69
2606 Mill Creek	154	145	142	143	146
4122 Rancho Vista	468	475	468	455	451
413 Pecan	110	114	115	117	116
663 Marleen	123	126	126	128	134
727 Gilpin	106	108	113	107	101
14115 River Forest	715	780	769	729	619
14102 Bluebird	2400	2300	2200	2200	1700
531 Woodbend	928	945	959	847	791

14111 Heatherfield	517	510	490	517	478
503 Ramblewood	823	832	796	826	857
620 Wren	691	698	709	715	767
13131 Boheme	605	621	628	602	586
323 Isolde	1200	1300	1200	1100	1000
322 Isolde	467	477	486	476	470
327 Electra	817	834	836	784	865
426 N Wilcrest	1200	1200	1100	1100	1100
14834 Oak Bend	482	480	494	430	433
318 Kickerillo	588	573	563	476	612
431 Kickerillo	572	534	531	471	479
14339 River Forest	668	660	637	583	591
14811 Oak Bend	467	475	484	368	366
12510 Boheme	1400	1400	1400	1500	1600
403 Hollow	1200	1700	1300	1100	1100
111 Paul Revere	1200	1200	1200	1200	1100
64 Legend	432	468	444	417	350
12601 Boheme	1200	1300	1300	1300	1200
415 Mignon	497	504	508	484	475
12707 Memorial	529	544	553	509	484
12735 Memorial	527	644	566	521	524
Sum	40233	40493	38537	36714	34810
Average	551	555	528	503	477