

# Social Vulnerability Index (SVI) and EPA Superfund Sites

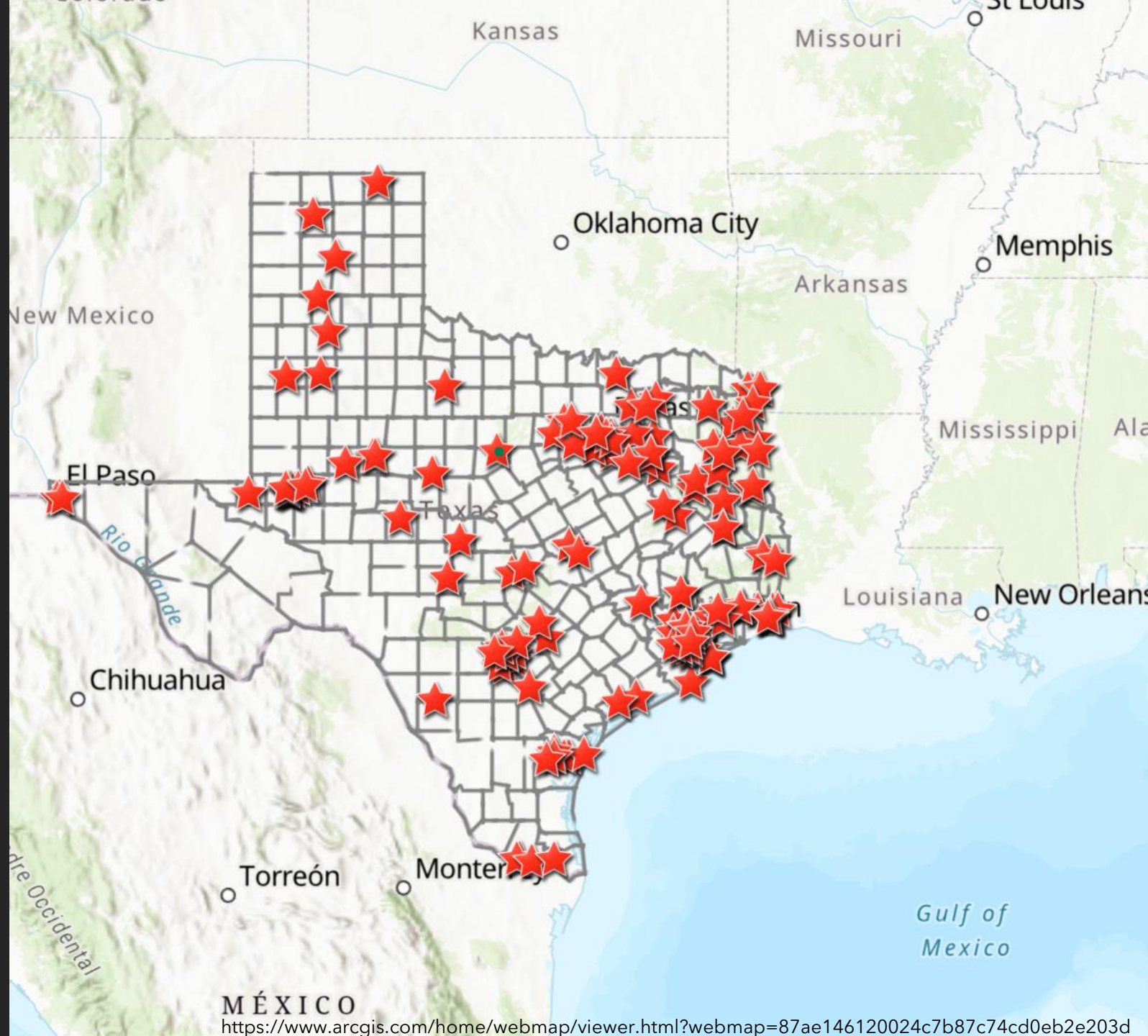
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# BACKGROUND

- CERCLA – comprehensive environmental, compensation and liability act.
- Sites where hazardous waste has been dumped, left out in the open, or otherwise improperly managed.
- Allows EPA to do clean ups and hold the parties responsible.

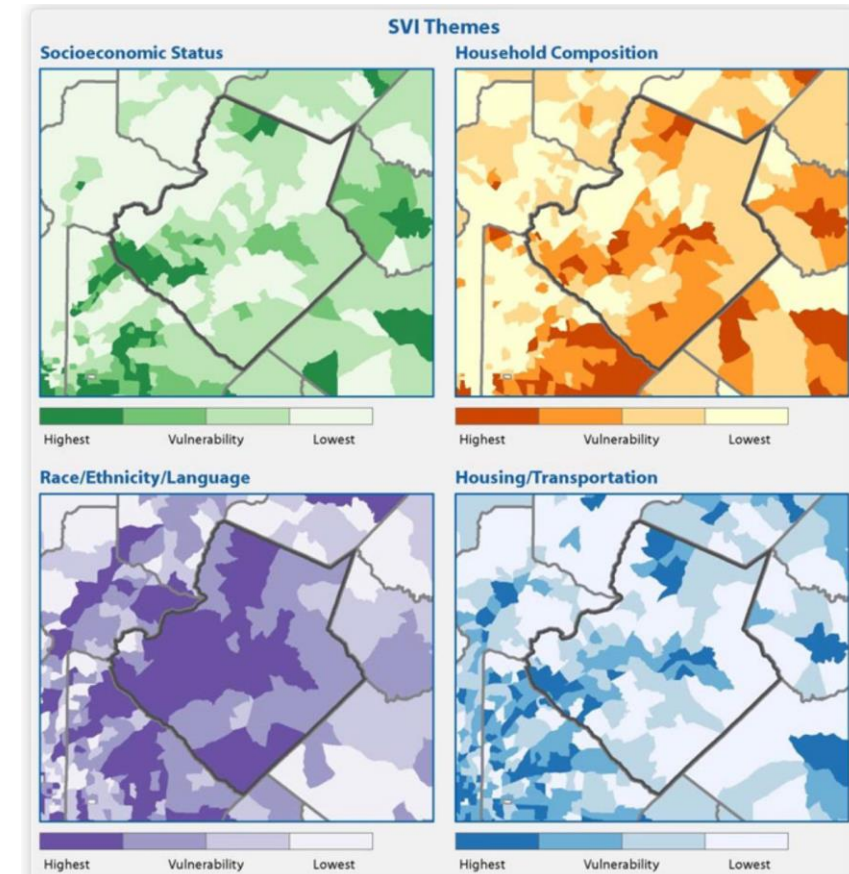
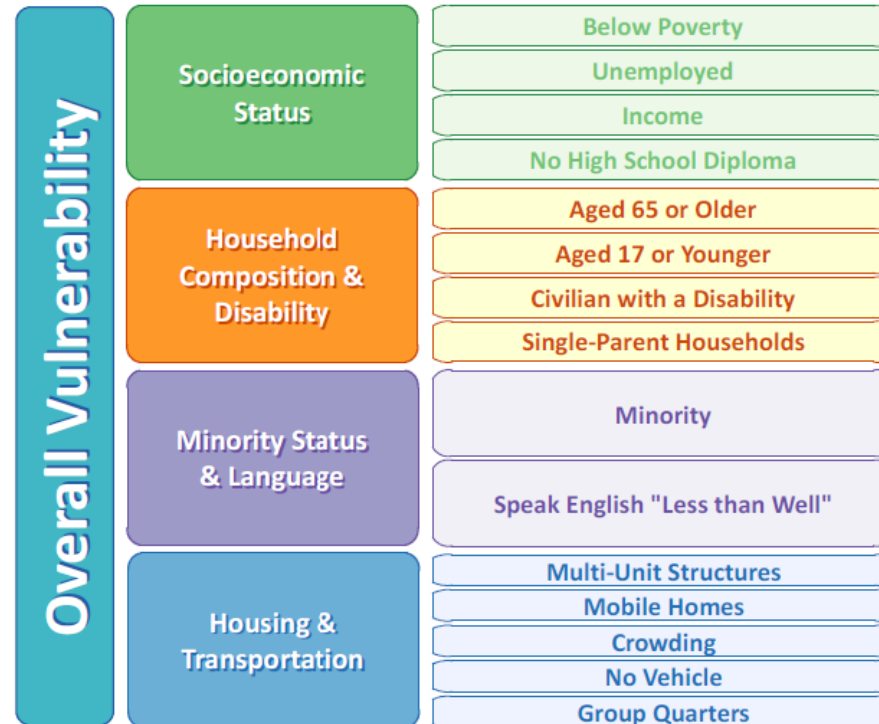


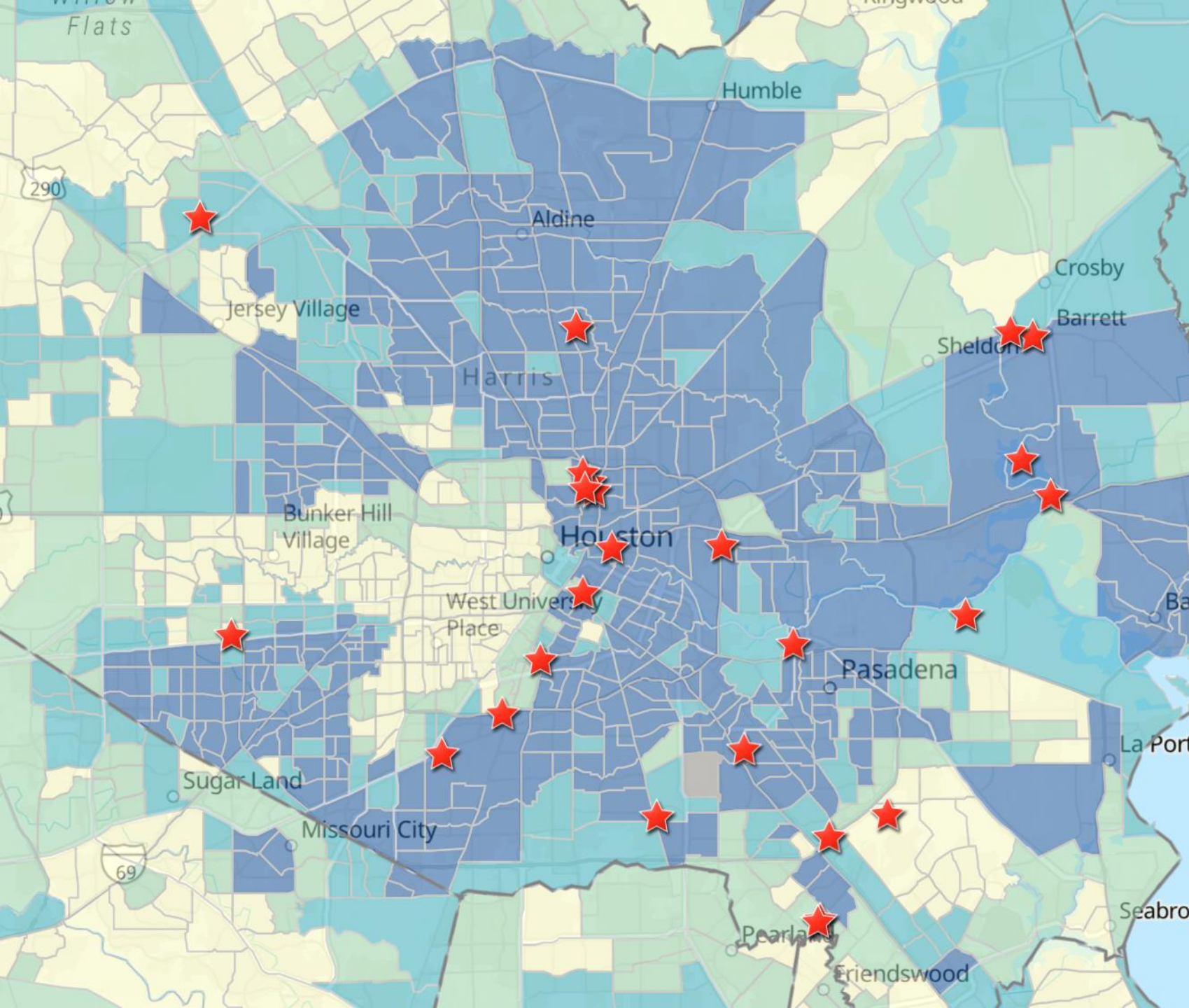


# BACKGROUND

## Variables Used

American Community Survey (ACS), 2010-2014 (5-year) data for the following estimates:





# QUESTION

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**Is there a correlation between SVI and location of Superfund sites?**

H1: Yes, the higher the social vulnerability in a census tract the more likely it is for superfund sites to occur.

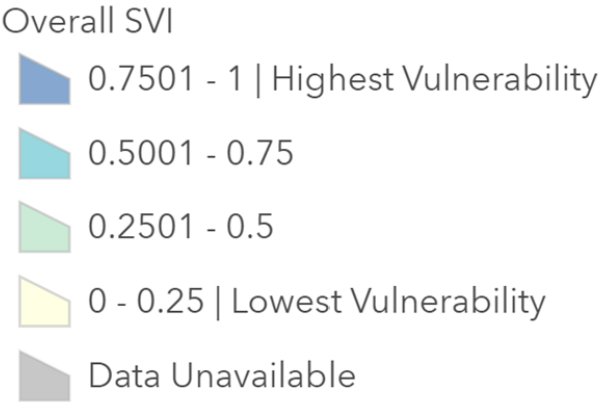
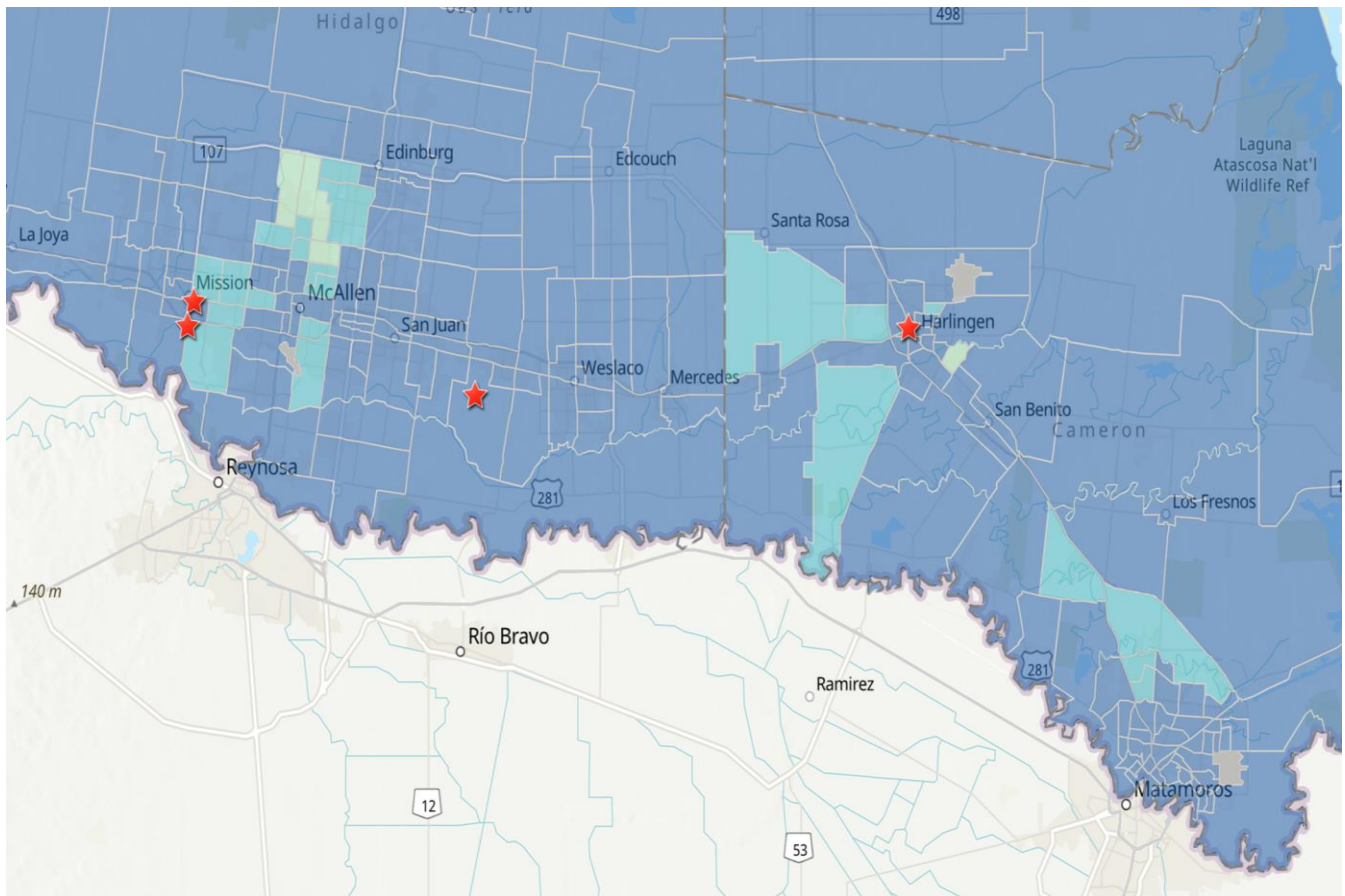
# METHODS

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- ArcMAP online:
  - Geocoded Superfund site locations and compared to exiting shapefiles.
  - Added CDCs 2014 SVI shapefile which contained 2014 data for each census track.
- Cleaned Data in Excel and converted to CSVs to upload into Jupiter Notebook.
  - For Hidalgo Co. and Cameron Co. separated the SVI for the 5 surrounding Census tracks and calculated the average.
  - For Harris Co. , Brazoria Co, Nueces Co, Cameron Co, Calhoun Co., Galveston Co. counted the total superfund site locations and categorize them with 'yes' or 'no' as being in a census track that showed an SVI greater than .750.



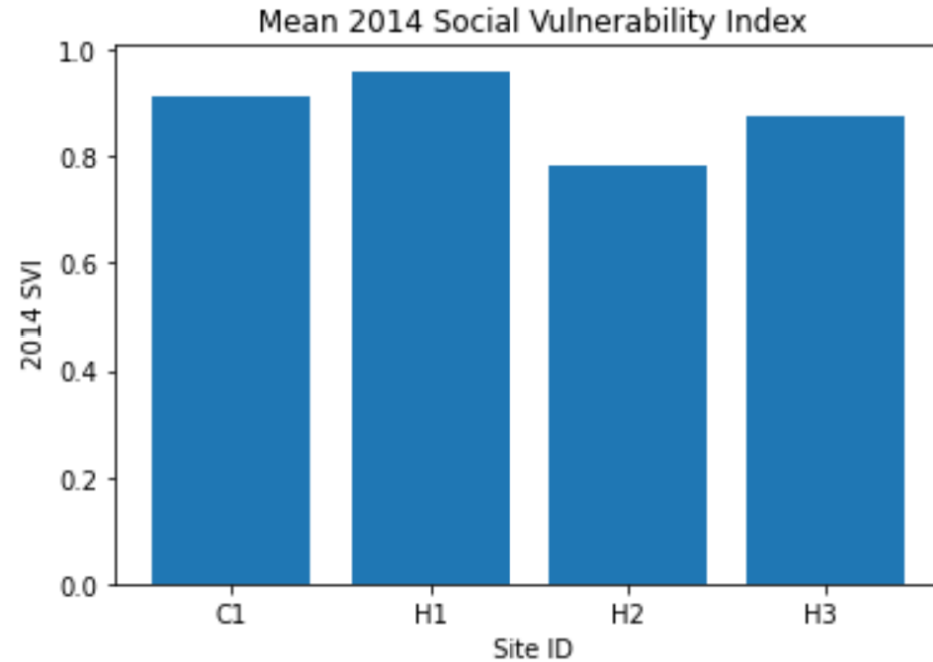
# HIDALGO CO AND CAMERON CO.



	Site ID	SVI 1	SVI 2	SVI 3	SVI 4	SVI 5	mean
0	C1	0.9627	0.8992	0.8883	0.8980	0.9095	0.91154
1	H1	0.9330	0.9404	0.9665	0.9791	0.9839	0.96058
2	H2	0.6457	0.9269	0.7360	0.6201	0.9903	0.78380
3	H3	0.9012	0.5659	0.9352	0.9962	0.9903	0.87776

# HIDALGO CO. & CAMERON CO.

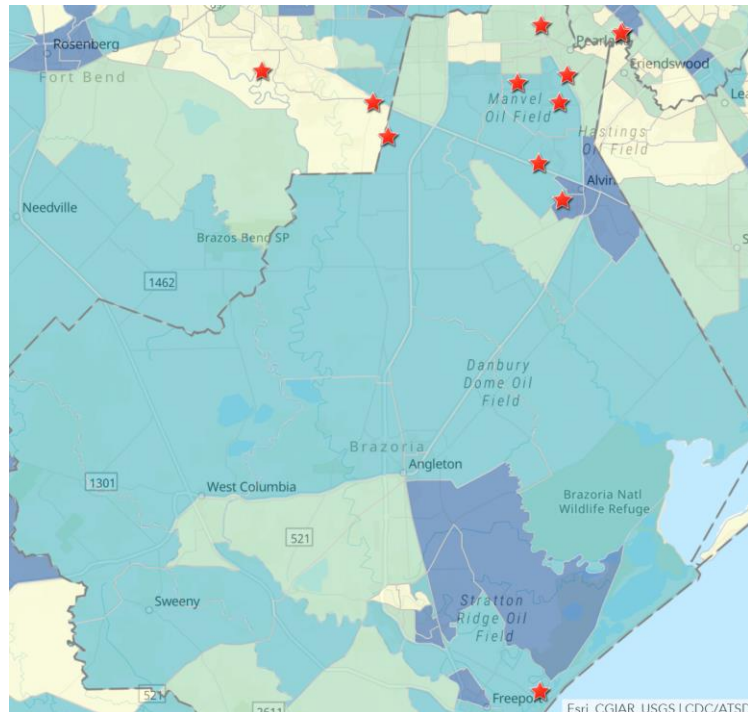
- All sites fall under high vulnerability, including most surrounding census tracks.
- Hard to say that there is a trend since most of the RGV has a high vulnerability index.



	Site ID	SVI 1	SVI 2	SVI 3	SVI 4	SVI 5	mean	Site ID	Location	Site Name	Latitude	Longitude
0	C1	0.9627	0.8992	0.8883	0.8980	0.9095	0.91154	C1	Cameron	Niagara Chemical	26.196256	-97.701806
1	H1	0.9330	0.9404	0.9665	0.9791	0.9839	0.96058	H1	Hidalgo	Donna Cannal	26.152212	-98.083630
2	H2	0.6457	0.9269	0.7360	0.6201	0.9903	0.78380	H2	Hidalgo	Hayes-Sammons Warehouse	26.213549	-98.323194
3	H3	0.9012	0.5659	0.9352	0.9962	0.9903	0.87776	H3	Hidalgo	Munoz Borrow Pits	26.187500	98.333889

# OTHER COUNTIES SVI >.750 & Sites

	county	SVIs.750
0	Brazoria	no
1	Brazoria	yes
2	Brazoria	no
3	Brazoria	no
4	Brazoria	no
5	Brazoria	no
6	Brazoria	no
7	Brazoria	no



```
Harris.count()
```

```
county      25  
SVIs.750    25  
dtype: int64
```

```
YES = Harris[Harris["SVIs.750"]=="yes"]
```

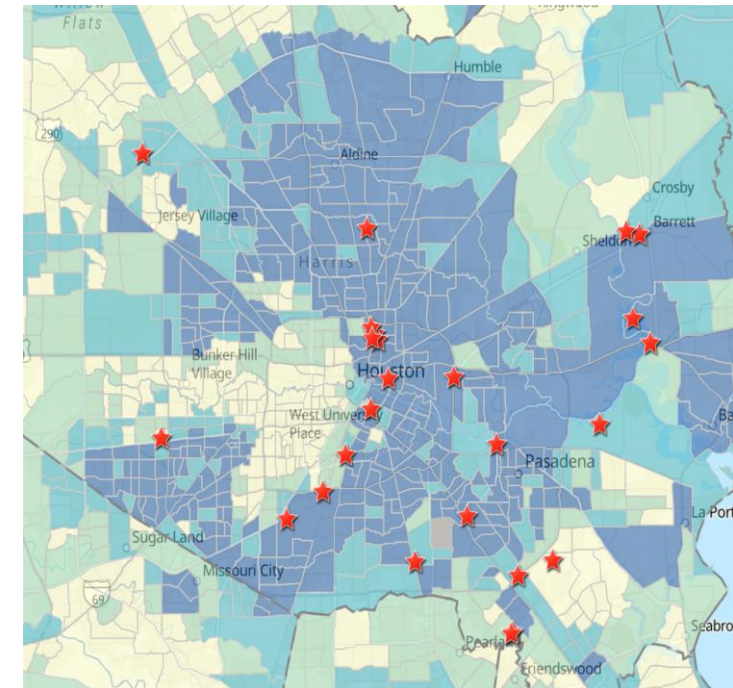
```
YES.count()
```

```
county      17  
SVIs.750    17  
dtype: int64
```

```
NO = Harris[Harris["SVIs.750"]=="no"]
```

```
NO.count()
```

```
county       8  
SVIs.750     8  
dtype: int64
```





# CONCLUSION

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- Hypothesis was somewhat wrong:
  - Three out of four sites in Hidalgo & Cameron Co. are in indicated highest socially vulnerable areas.
  - When looking at other 8 counties total, 28 out of 49 sites are in highest indicated socially vulnerable areas.
  - Locations can be unique Brazoria Co one out of eight was in a highest indicated socially vulnerable area.
- More data analyses must be conducted: looking at specifically SVI theme data and not the overall mean.
  - Looking at specific SVI theme data and location of statewide superfund sites.
  - Looking at specific SVI theme data and active superfund sites vs inactive superfund sites.

# REFERENCES

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## References

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