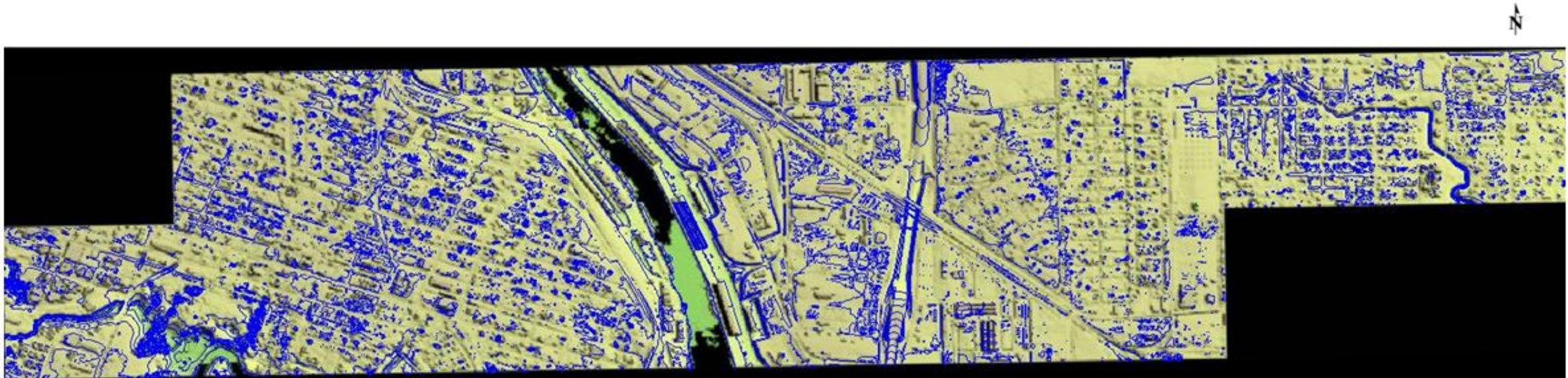


# Project 2 \_ Floods

Jorge Andres Celis



# Hurricane Harvey

August 25-30, 2017

Category 4 hurricane.

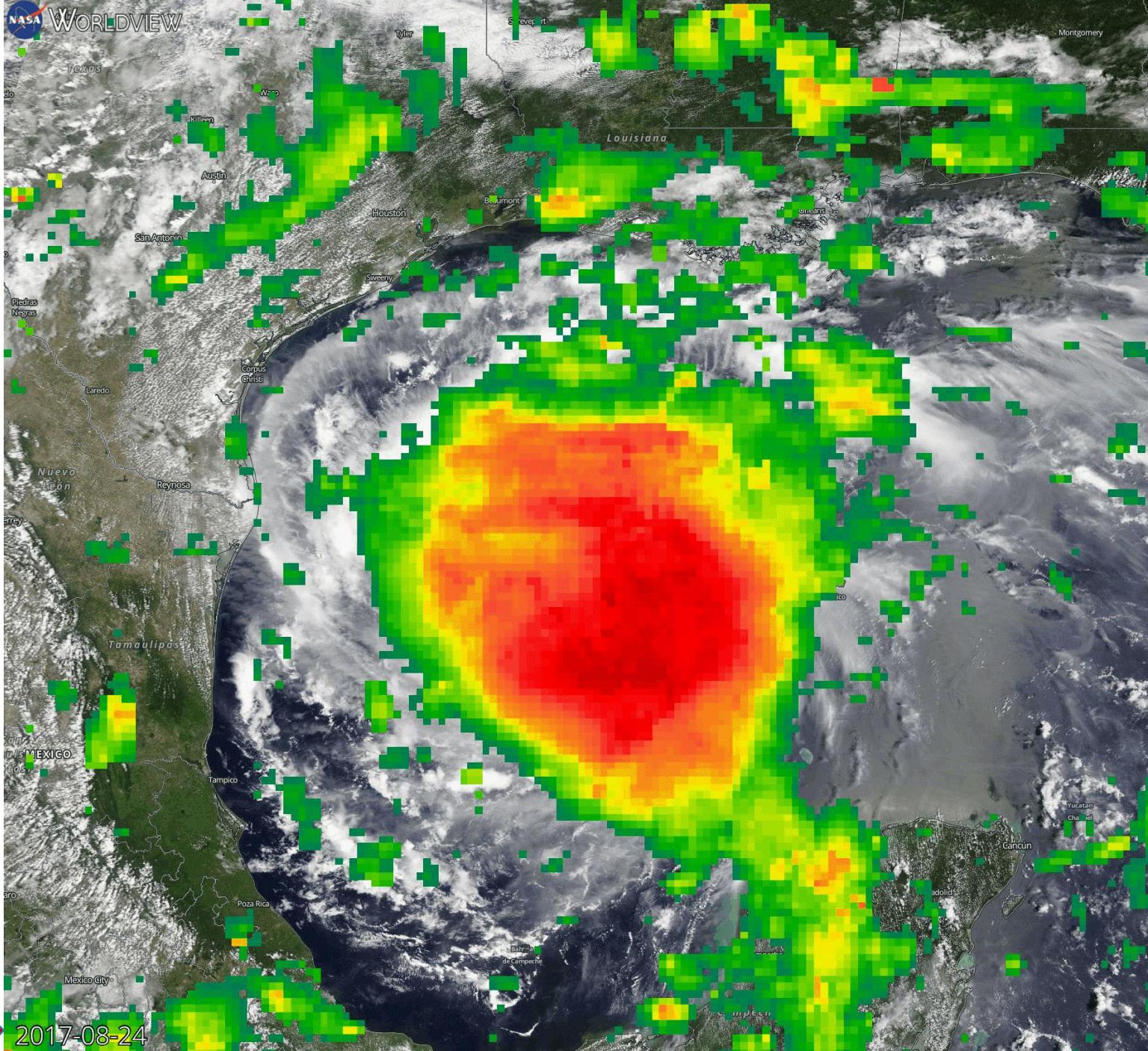
Landfall along the Texas coast near Port Aransas around 10:00 p.m. on **August 25<sup>th</sup>**.

**26<sup>th</sup>** rapid development of flash flooding between 10:00 p.m. and 1:00 a.m. across much of Harris County.

The morning of the **27<sup>th</sup>** saw additional rain bands

Heavy rainfall continued to spread through much of the **29<sup>th</sup>** and the **30<sup>th</sup>** exacerbating the ongoing widespread and devastating flooding.

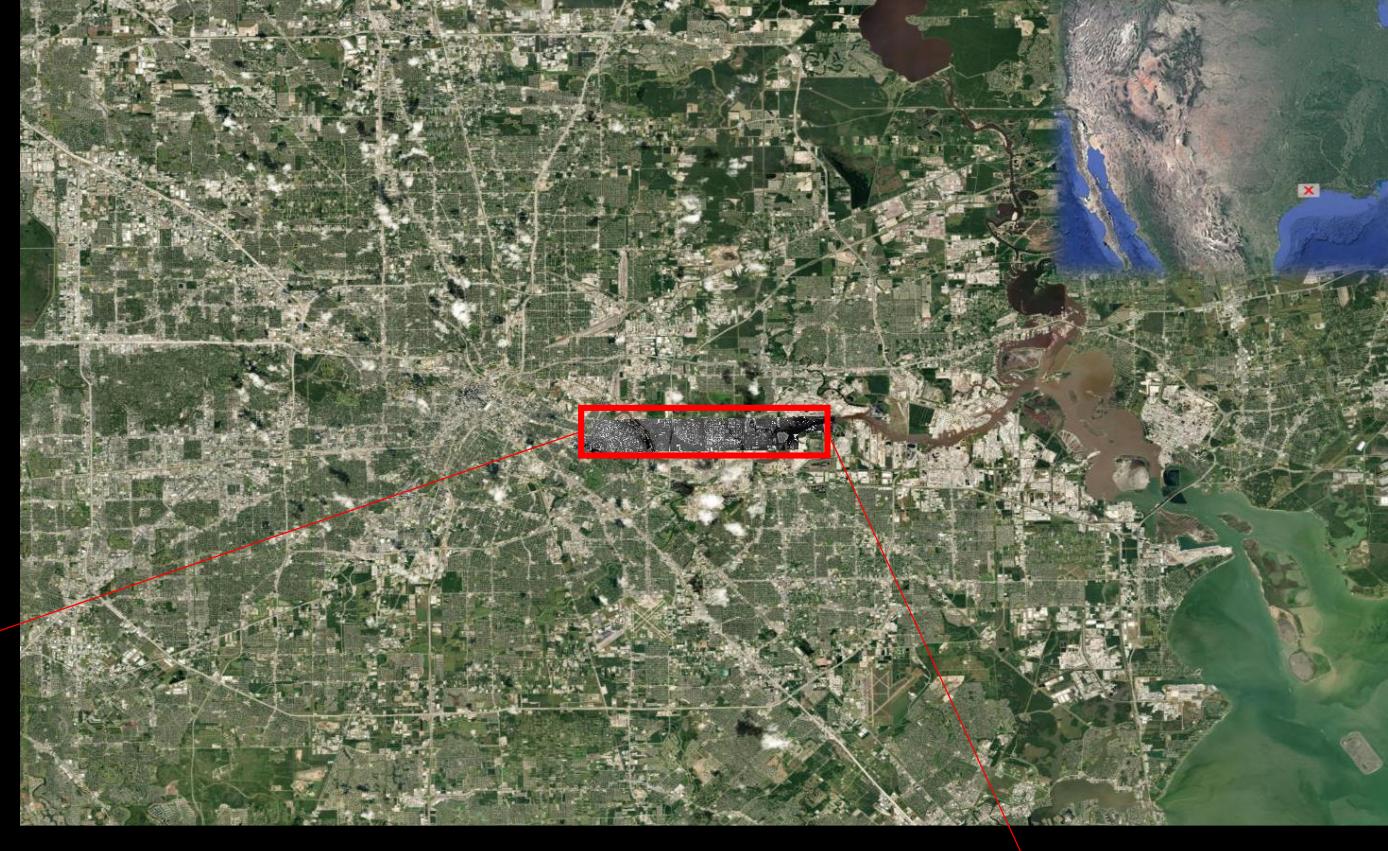
Drainage issues and rivers raised greatly. Only around 10 percent of the river forecast points in southeast Texas remained below flood stage due to the event, and approximately 46 percent of the river forecast points reached new record levels. More than 120 Billion dollars on damages.



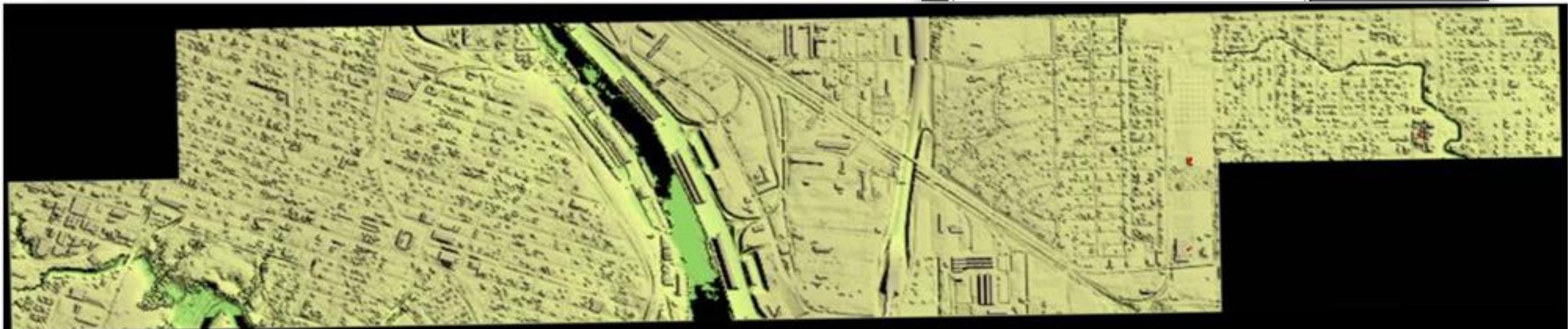
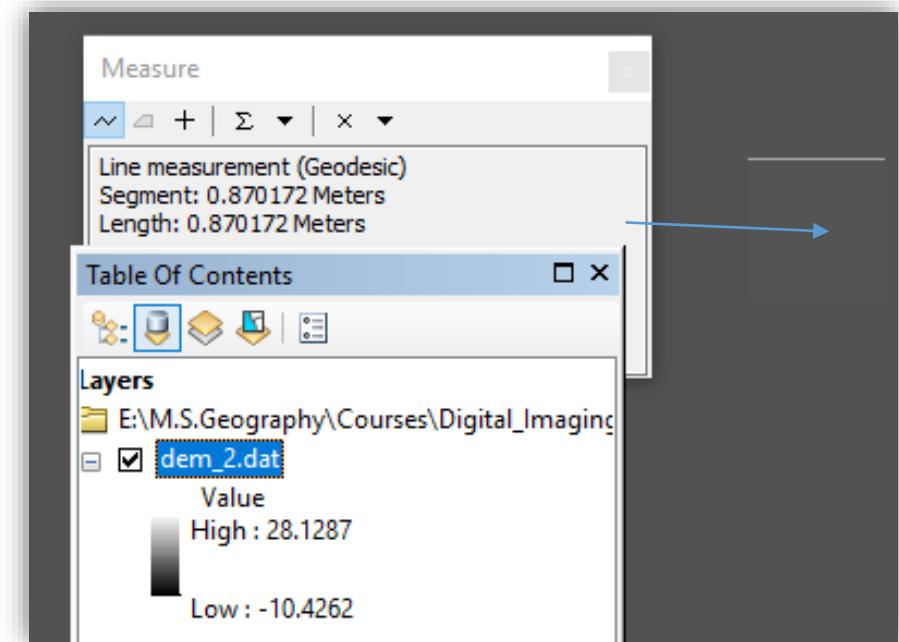
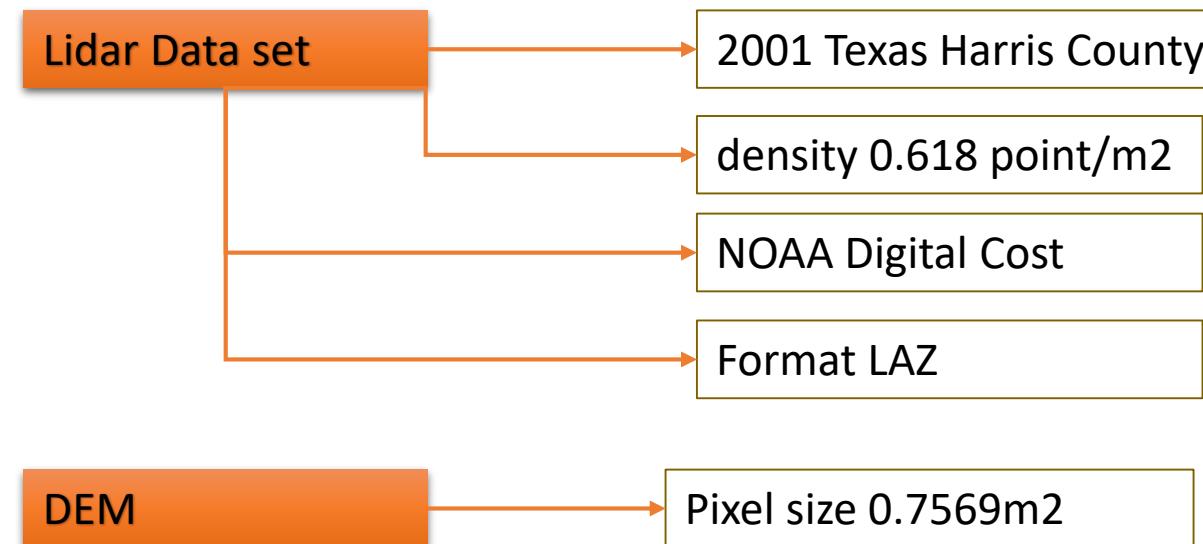
Play animation of the event

# Houston, TX

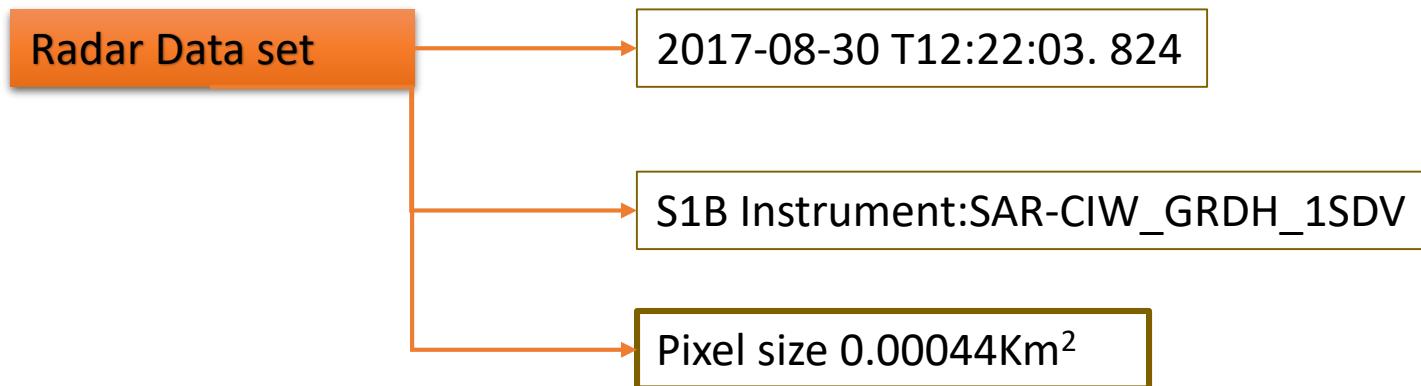
- Population 2.313 million Houston.
- Study Area Navigation Blvd/Canal St.
- Suburban Neighborhood
- Study focus: Neighboring channel section.



# Data Information



# Data Information



Acq. Mode	Product Type	Resolution Class	Resolution <sup>1, 2</sup> [Rng x Azi] <sup>3</sup> [m]	Pixel Spacing <sup>2</sup> [Rng x Azi] [m]	No. Looks [Rng x Azi]	ENL <sup>4</sup>
IW	SLC		2.7 x 22 to 3.5 x 22	2.3 x 14.1	1	1
	GRD 	HR 	20 x 22	10 x 10	5 x 1	4.4
		MR	88 x 87	40 x 40	22 x 5	81.8

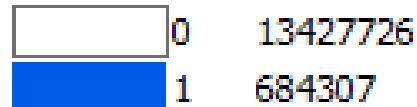
# Flood Risk Area

Pixel size  $0.7569\text{m}^2 = 7.569\text{e-7Km}^2$

Area **14'112.033 pixels 10.65 Km} **

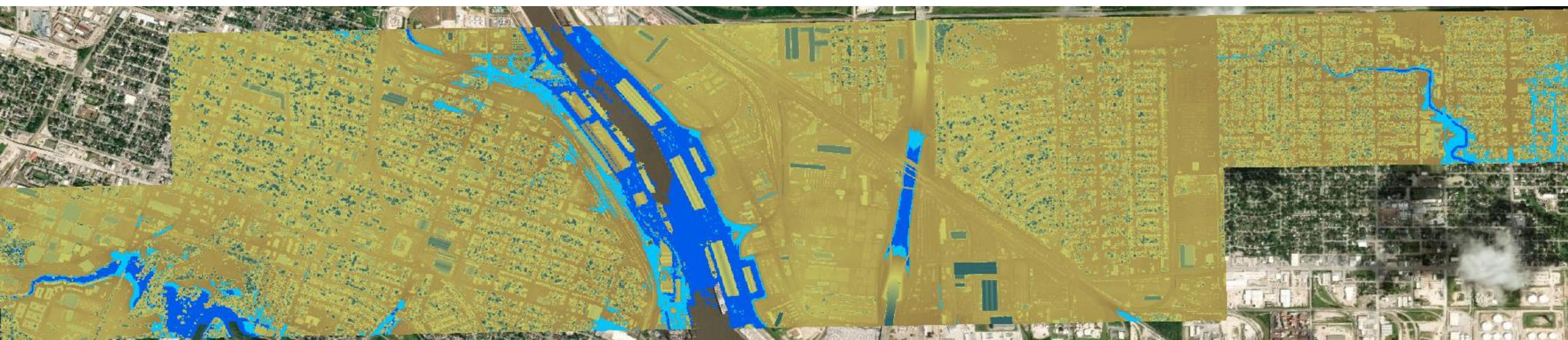
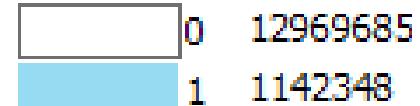
Estimated Area with very high flood risk

**4.84% Flooded Area 0.5164Km<sup>2</sup>**



Estimated Area with high flood risk

**8.11% Flooded Area 0.8648Km<sup>2</sup>**



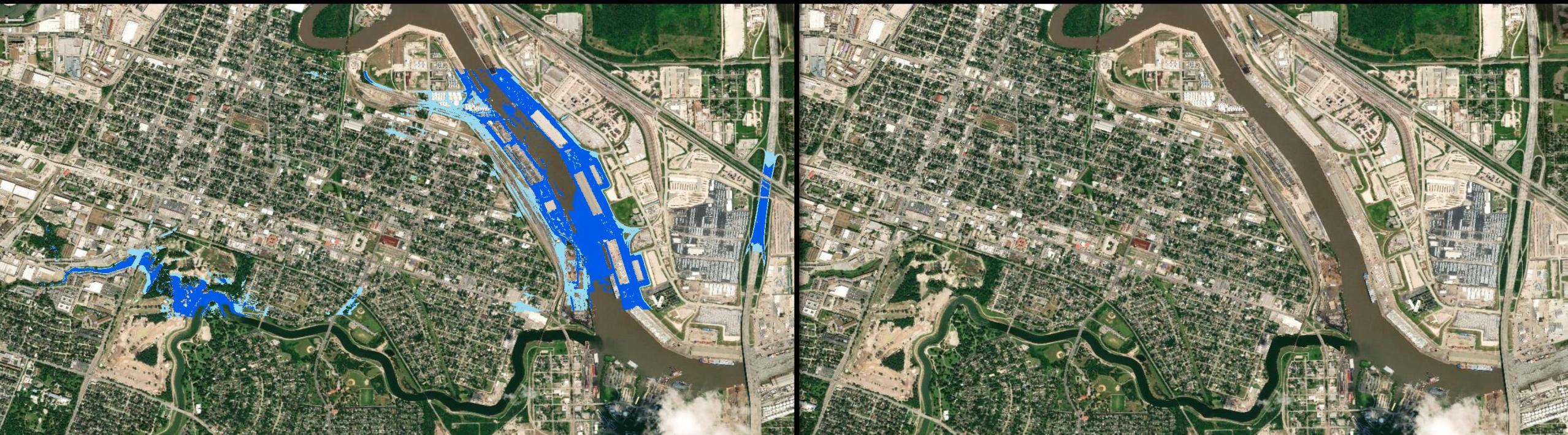
# Harvey Impacts

## Canal St. Area

Very High Flood Risk



High Flood Risk



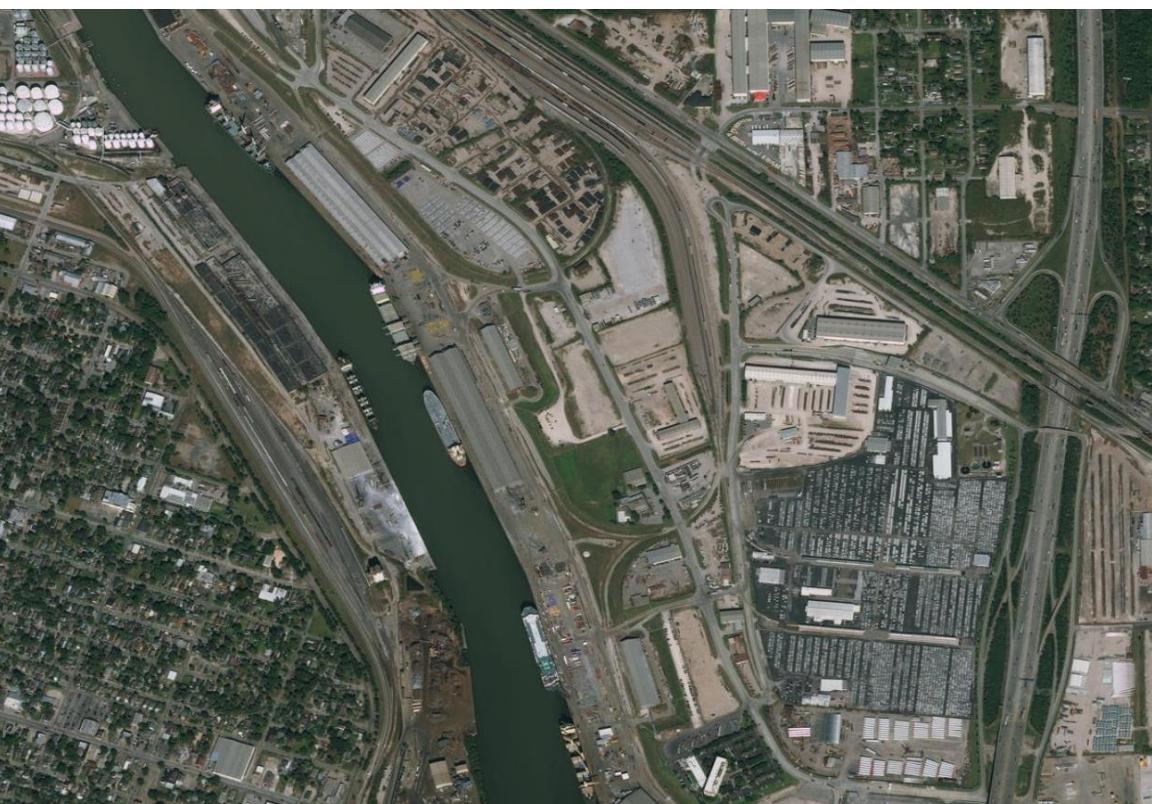
# Harvey Impacts

## Canal St. Area

Very High Flood Risk



High Flood Risk



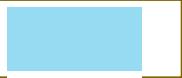
# Harvey Impacts

## Canal St. Area

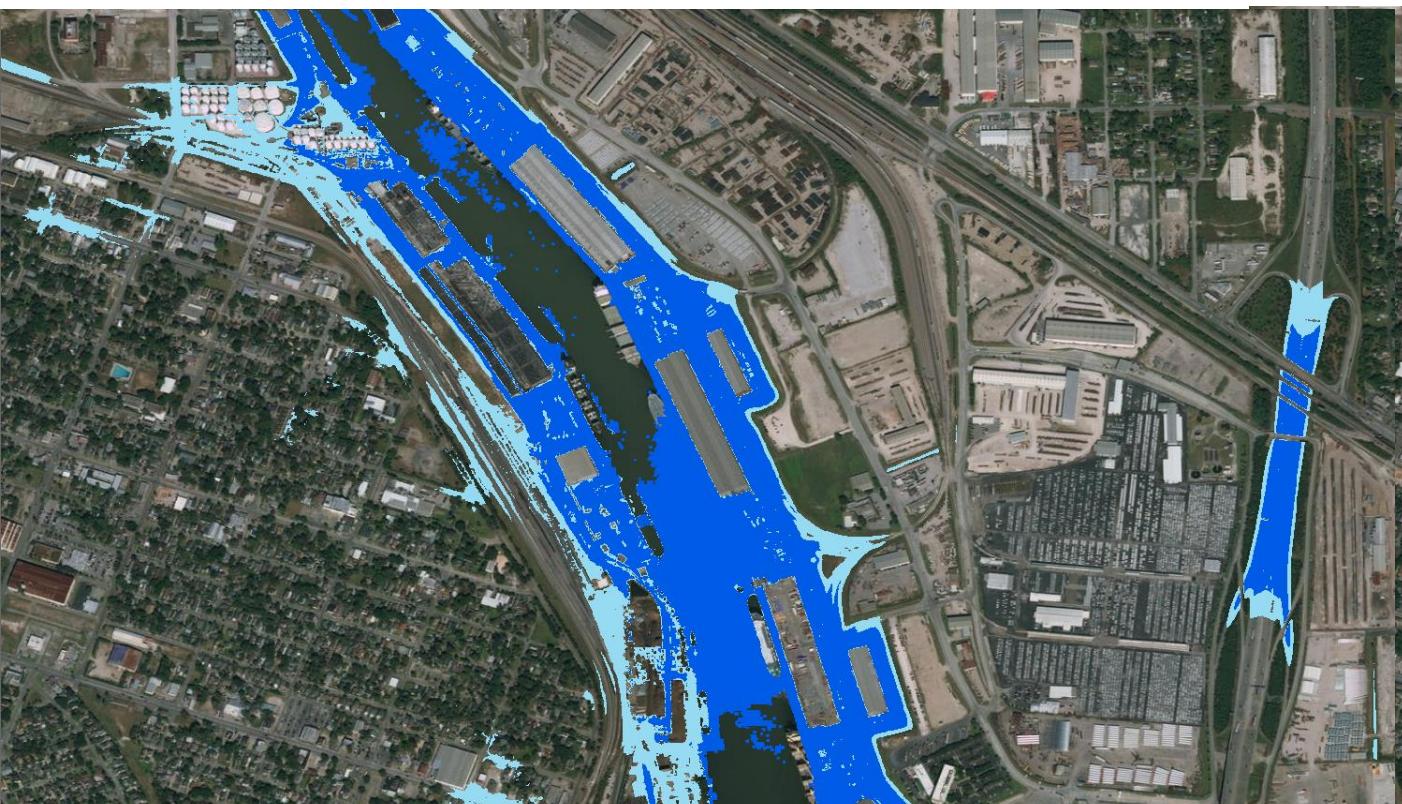
Very High Flood Risk



High Flood Risk



Flooded Areas August 30<sup>th</sup> 2017

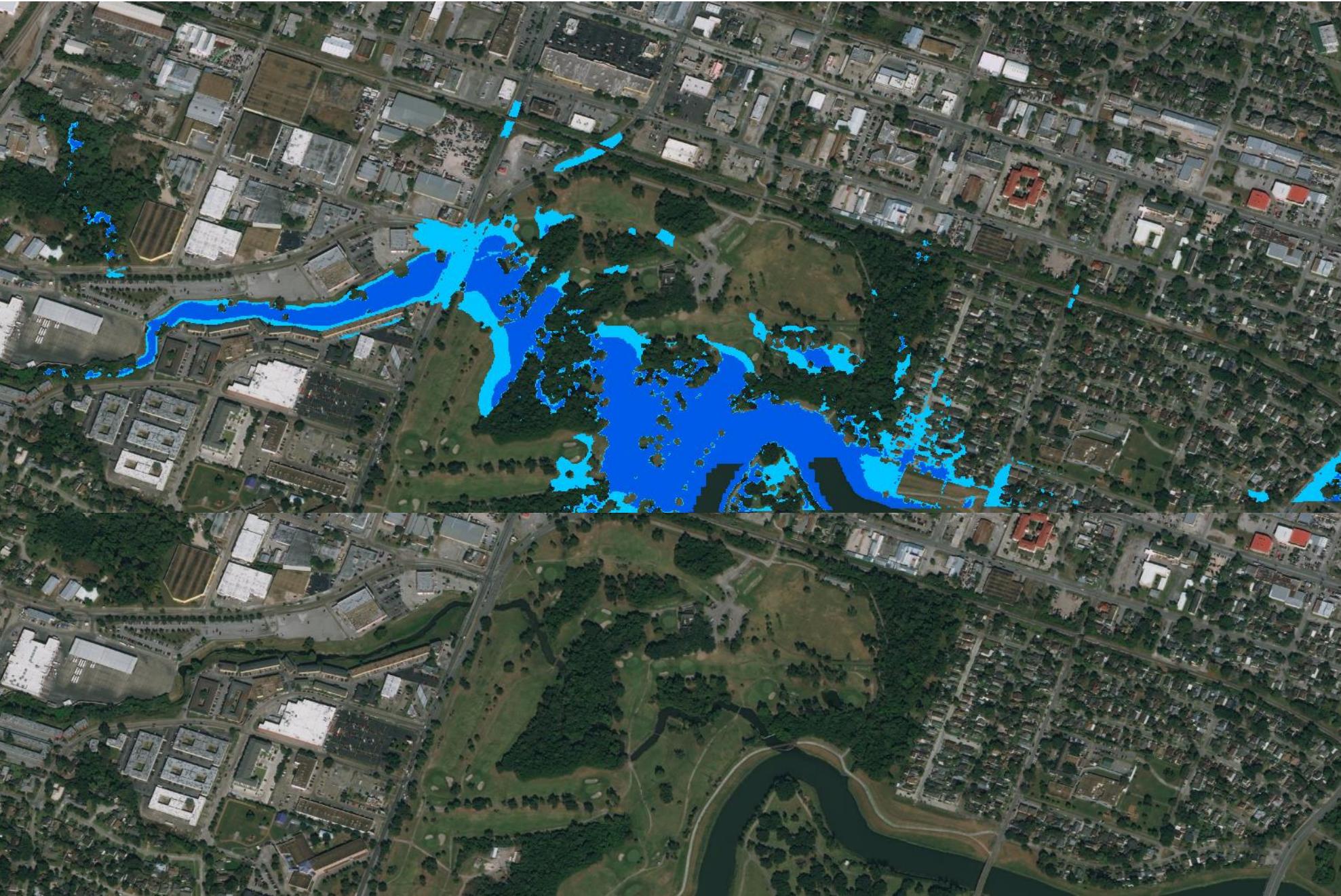


# Harvey Impacts

Canal St. Area

Very High Flood Risk

High Flood Risk



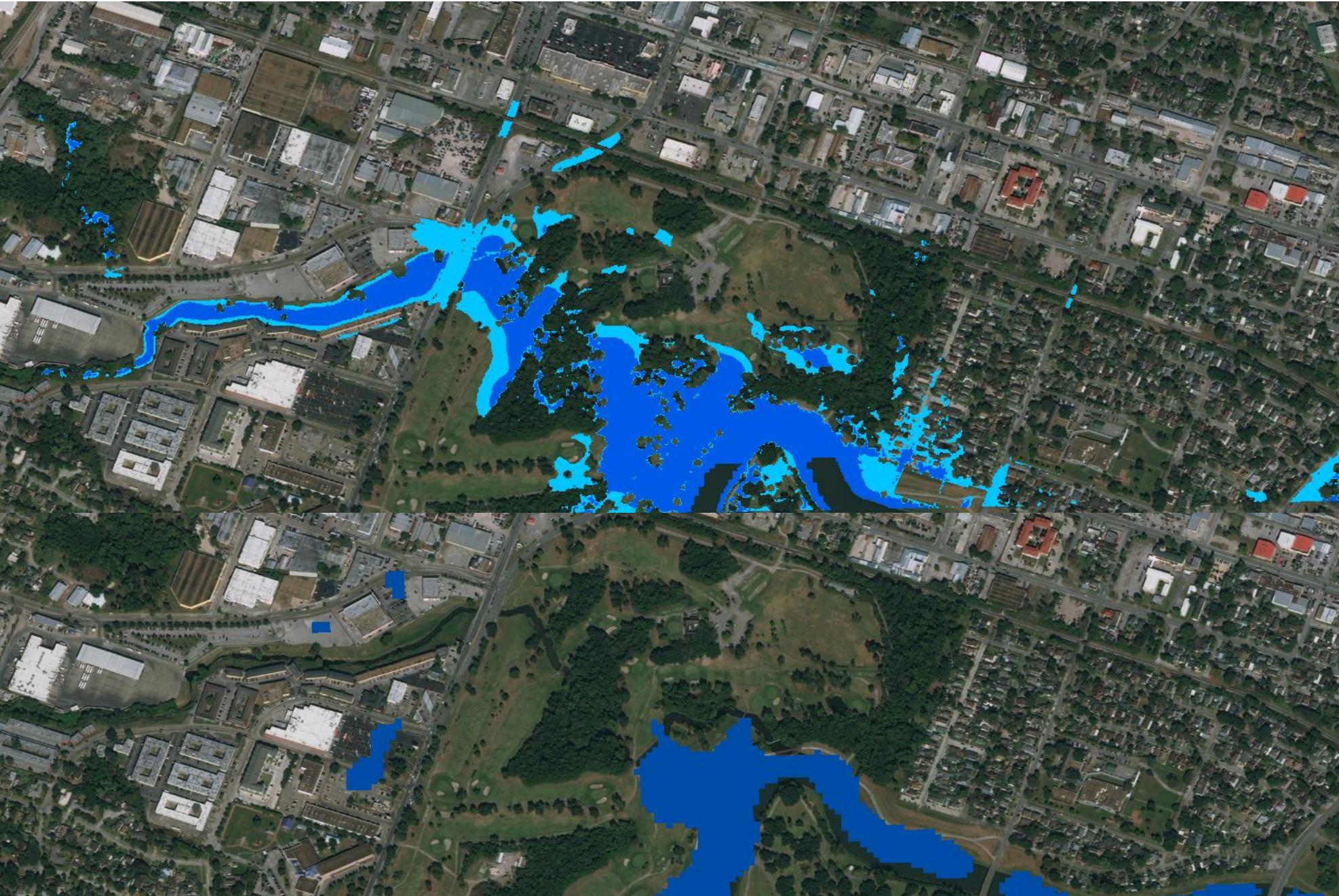
# Harvey Impacts

Canal St. Area

Very High Flood Risk

High Flood Risk

Flooded Areas August  
30<sup>th</sup> 2017



# Harvey Impacts

## Canal St. Area

Very High Flood Risk



High Flood Risk



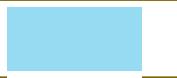
# Harvey Impacts

## Canal St. Area

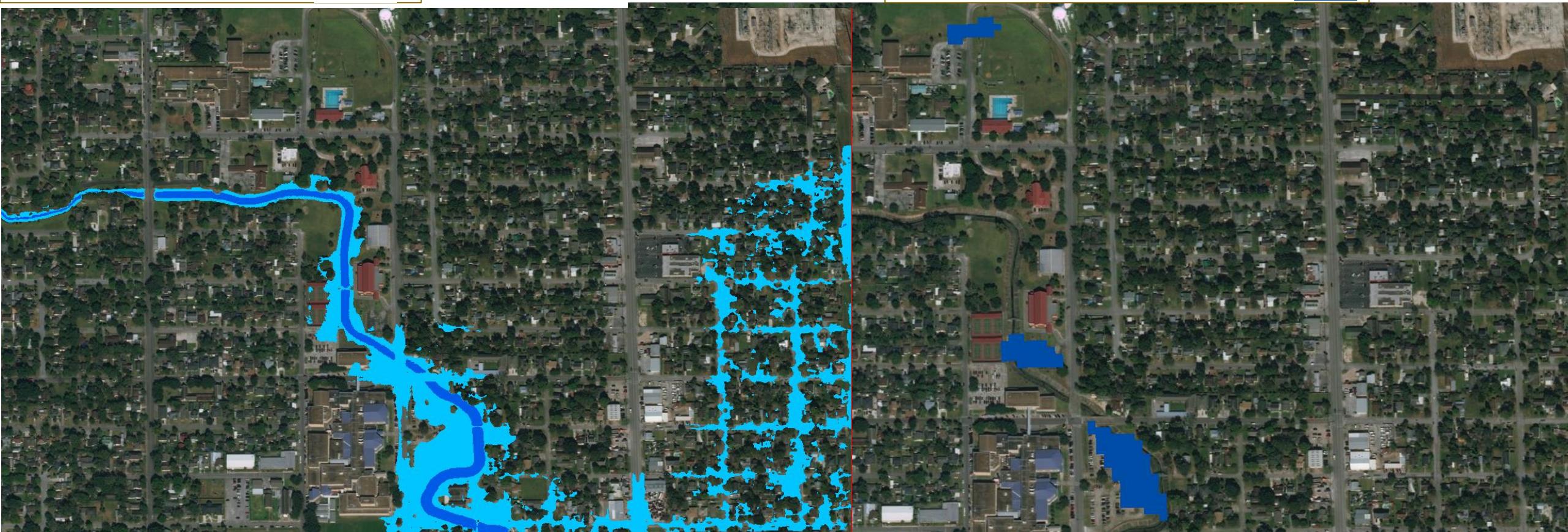
Very High Flood Risk



High Flood Risk



Flooded Areas August 30<sup>th</sup> 2017



# Conclusions

Most of the affected areas were located next to a streamflow or water body.

The areas predicted with higher risk of flooding during Harvey Hurricane by August 30<sup>th</sup> of 2017 remained flooded.

Retention ponds in the greener area of the study field, could reduce the flooding risk.

The acquisition period of the LiDAR data corresponds to 2001, showing that there is no many change in the Blvd/canal street. However, there could be a bias related to the civil works and changes made during the last 18 years over the study area.

*On future work, would be interesting to estimate the water high on the different areas and analyze the different patterns.*