

Evaluating the Extent of Tornado Damage in Arabi, Louisiana

Sydney Goldberg
and
Matthew Nelson



What happened?

- According to the NWS of New Orleans, a strong low pressure system produced supercell thunderstorms over portions of metro New Orleans in Southeast Louisiana during the evening hours of Tuesday, March 22, 2022.
- Two tornadoes were reported with these supercell thunderstorms as they moved across portions of metro New Orleans.
- The most significant tornado impacted the community of Arabi in St. Bernard Parish, LA.
- As a high-end EF-3 tornado with 160 mph winds, this tornado was the strongest on record to hit the New Orleans metropolitan area.

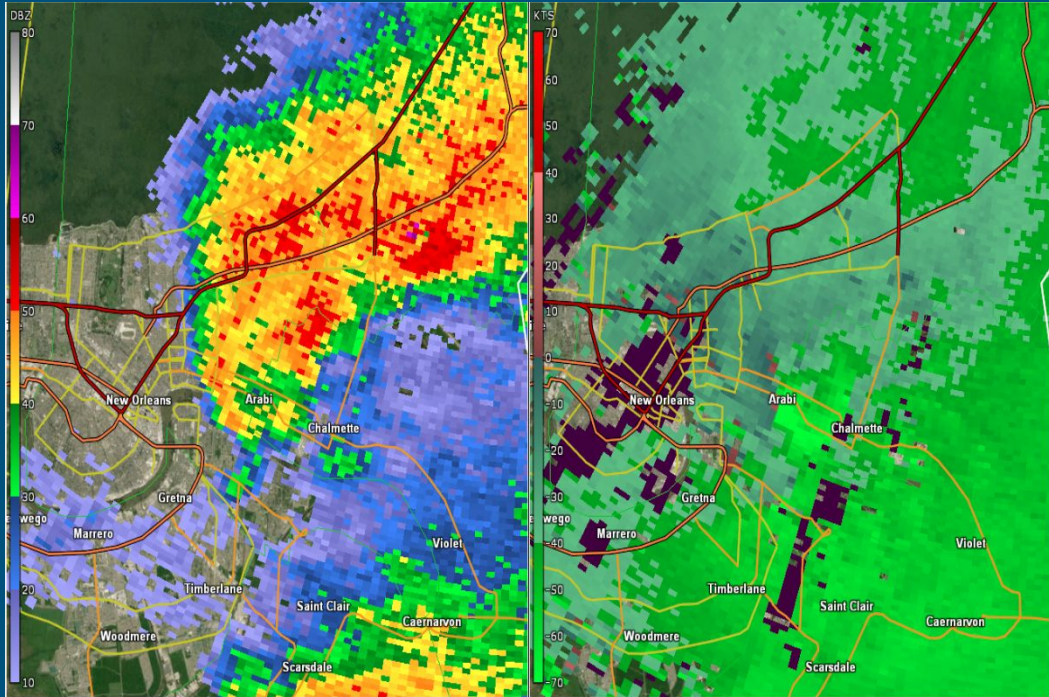


Image of tornado taken by Jacob Goldberg (Sydney's brother) in Arabi



St. Bernard Parish

Where is Arabi, LA?



KLIX WSR-88D radar data near Arabi, LA at 730 PM CDT 3/22/2022



Arabi (census-designated place) in St. Bernard Parish

Research Methods

1. Gather data from various organizations regarding damage from the St. Bernard tornado
2. Compile data in ArcGIS Pro and modify data to fit in Arabi boundary to allow for analyze damage specifically in Arabi, Louisiana.

Gathered data from:

- St. Bernard Parish Department of Emergency Management: aerial photography
- National Weather Service of New Orleans: specific tornado data, damage assessments
- Federal Emergency Management Agency: Damage assessments
- US Census Bureau, Department of Commerce: Arabi boundary

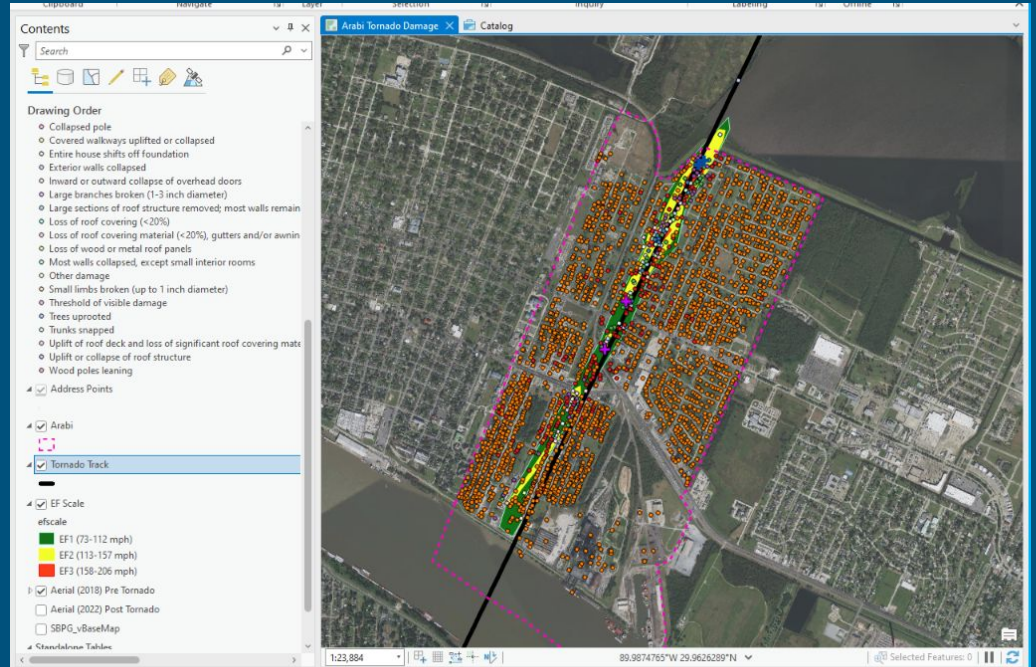
What is the full extent of damage in Arabi from the rare EF 3 Tornado?

What we mapped:

- St. Bernard Parish Map
- Arabi census outline
- Aerial image (2018) pre-tornado
- Aerial image (2022) post-tornado
- Tornado track
- EF scale/estimated winds
- Deaths
- Injuries
- FEMA Structure Damage Scale in Arabi
- Damage type near track

Results

- Complete map of damage and tornado data in Arabi, LA.
- Most destruction near the track, a few affected structures near the perimeter of Arabi
- 1,842 homes structures unaffected
- 171 structures were affected
- **14 structures destroyed**
- **32 structures major damages**
- 37 structures minor damage
- Deaths and injuries near tornado track

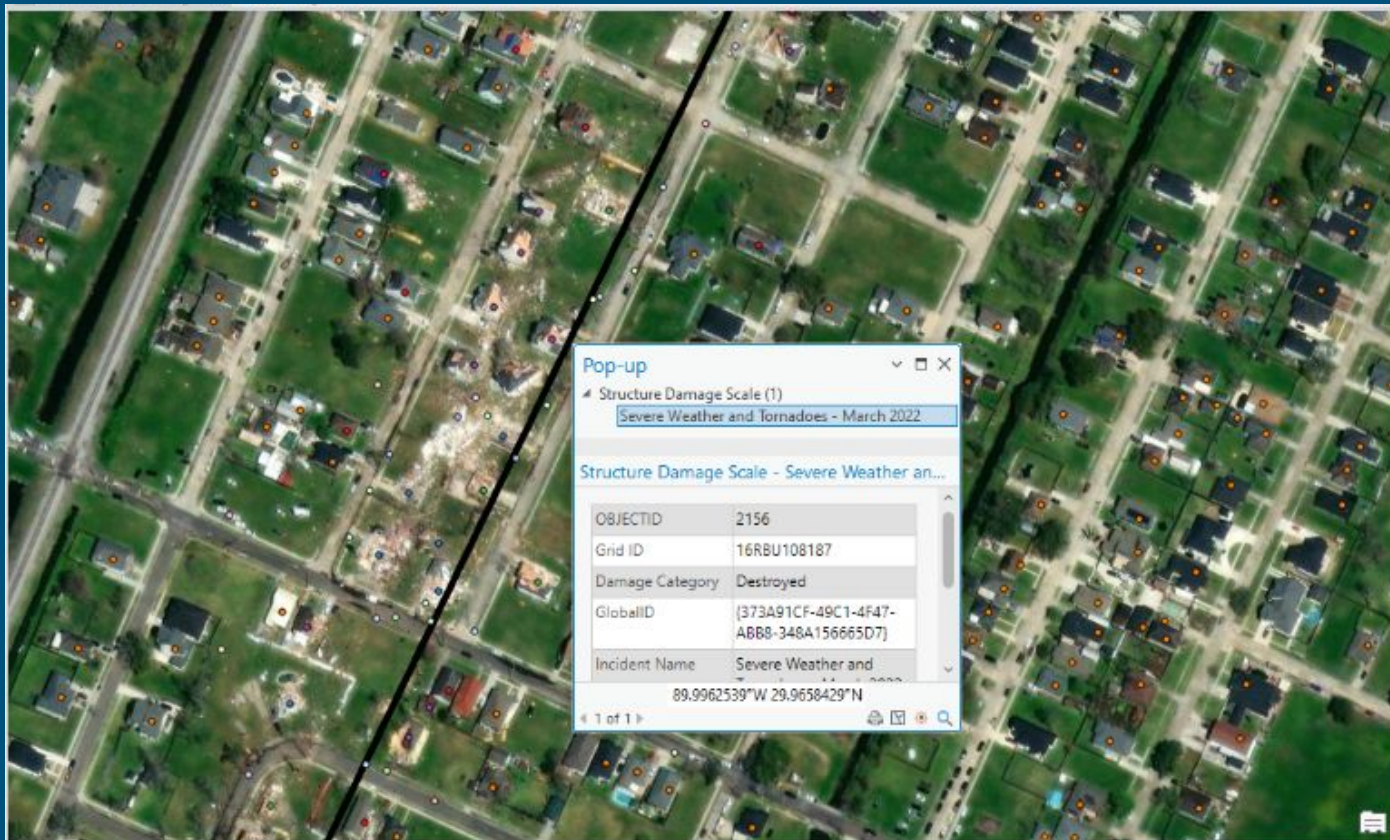












Pop-up

Structure Damage Scale (1)

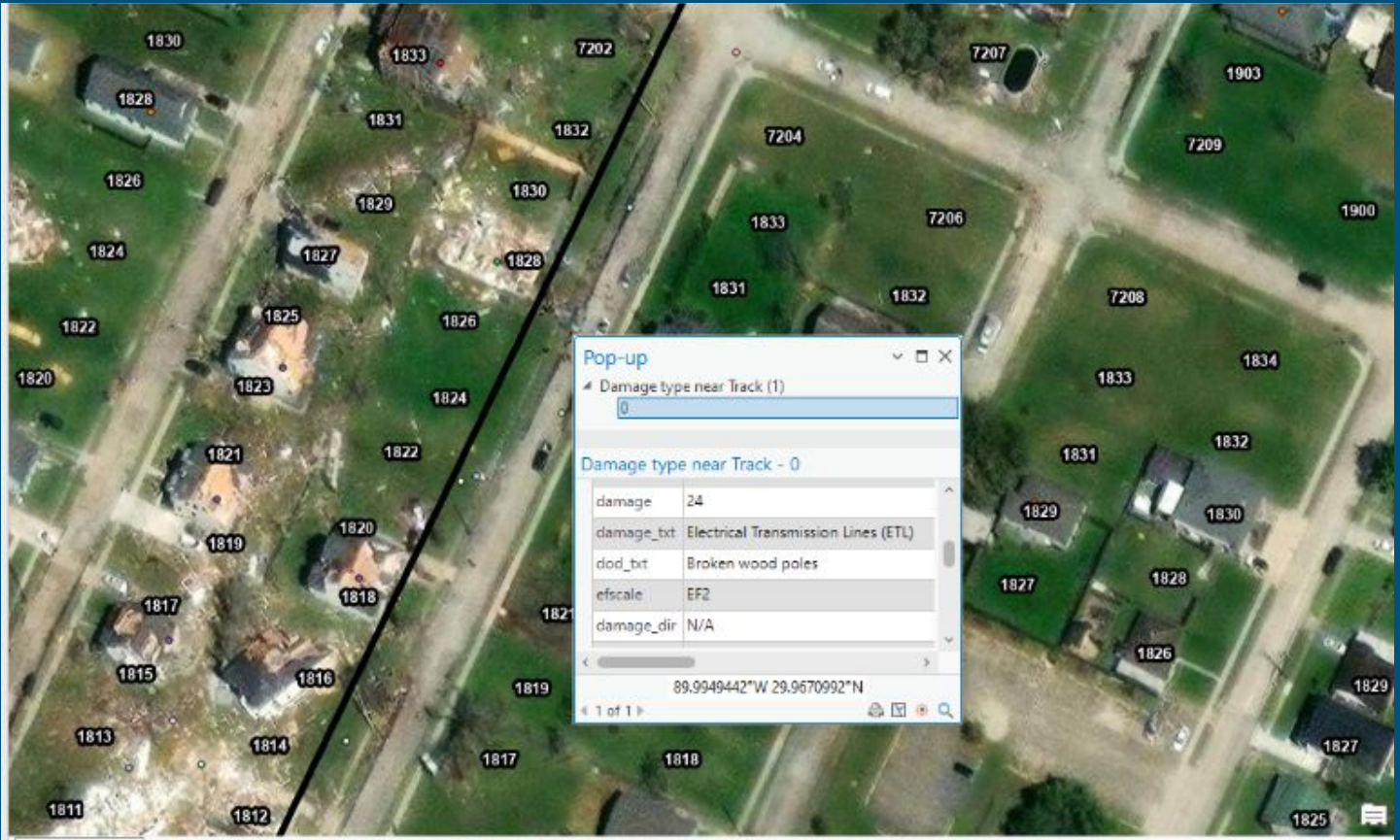
Severe Weather and Tornadoes - March 2022

Structure Damage Scale - Severe Weather an...

OBJECTID	2156
Grid ID	16RBU108187
Damage Category	Destroyed
GlobalID	[373A91CF-49C1-4F47-ABB8-348A156665D7]
Incident Name	Severe Weather and

89.9962539°W 29.9658429°N

1 of 1



Pop-up

Damage type near Track (1)

0

Damage type near Track - 0

damage	24
damage_txt	Electrical Transmission Lines (ETL)
dod_bit	Broken wood poles
efscale	EF2
damage_dir	N/A

89.9949442°W 29.9670992°N

1 of 1

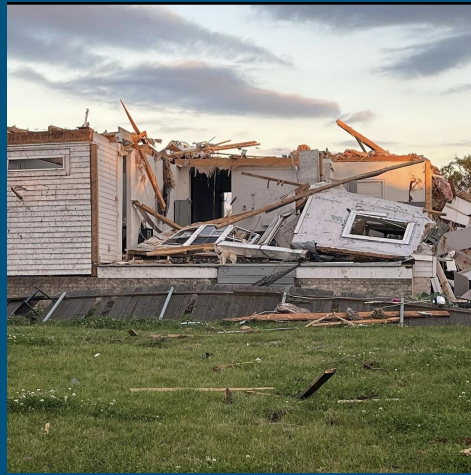
Conclusion & Analysis

- Arabi is currently going through gentrification.
 - Mixture of socioeconomic statuses
- From comparing the two aerial photos (2018 vs. 2022) the neighborhood has expanded drastically within a few years.
- Looking at damage assessment points and aerial photography, newer construction withstood wind speeds better, having overall less damage near the tornado track compared to the structures that were there in 2018.
 - For example, during the National Weather Service of New Orleans' damage assessment, two areas of EF-3 wind speeds were determined differently based on the ages of the construction
 - One area of concentrated EF-3 damage was a house that was swept off its raised foundation with all walls and the roof destroyed. This was near where the one recorded fatality occurred. Due to the poor construction, the damage to this house was rated an EF-3.
 - In the other EF-3 area, the newer houses had additional strapping directly into the foundation as well as strapping from the cinder blocks to the foundation. The house itself held together, but it was shifted about 50 yards to the north and rotated about 90 degrees. The house next door was also swept of the foundation, moved, and mostly destroyed.
 - Newer construction built within the past few years for flood mitigation



Aerial 2018 vs 2022





References

Data:

Damage Assessment Toolkit (2022) [downloaded file]. National Oceanic and Atmospheric Administration. URL: <https://apps.dat.noaa.gov/stormdamage/damageviewer> [October, 2022].

SBPG Address Viewer (2021) [downloaded file]. St. Bernard Parish Government, Chalmette, LA. URL: <https://www.arcgis.com/apps/mapviewer/index.html?webmap=2f5450e9b5c74eaba37f0961748c7914&extent=-89.9745,29.9478,-89.9639,29.9536> [October, 2022].

St. Bernard Parish Zoning (2019) [downloaded file]. St. Bernard Parish Government, Chalmette, LA. URL: <https://www.arcgis.com/apps/mapviewer/index.html?webmap=57d4c8ba19964f99ac77570cfa32de99&extent=-90.1529,29.6056,-89.0248,30.1794> [October, 2022].

TIGER/Line Shapefile, 2019, state, Louisiana, Current Place State-based (2019) [downloaded file]. General Services Administration. URL: <https://catalog.data.gov/dataset/tiger-line-shapefile-2019-state-louisiana-current-place-state-based> [October, 2022]

Severe_Weather_and_Tornadoes_March_2022 (2022) [downloaded file]. Federal Emergency Management Agency. [October, 2022].

Tornado Info

US Department of Commerce, N. O. A. A. (2022, March 24). *NWS Lix - March 22, 2022 Tornado Event*. National Weather Service. Retrieved November 15, 2022, from <https://www.weather.gov/lix/03222022severe#:~:text=Severe%20Weather%20Event%20of%20March%2022%2C%202022&text=There%20were%20two%20tornadoes%20reported,been%20confirmed%20from>

Wikimedia Foundation. (2022, November 6). *St. Bernard Parish, Louisiana*. Wikipedia. Retrieved November 15, 2022, from https://en.wikipedia.org/wiki/St._Bernard_Parish,_Louisiana

Questions?



Work Contributions

Sydney:

- ArcGIS Pro formatting
- Emailed organizations for data
- Created powerpoint slides
- Analyzed combined data on ArcGIS Pro/Results
- Gathered images of tornado damage

Matthew:

- Tornado & storm research
- Emailed organizations for data
- Created powerpoint slides
- Analyzed combined data/results on ArcGIS Pro