U.S. Tornadoes Events Analysis

Presented by:

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OVERVIEW

01 DATASET/CLEANING

02 DATABASE

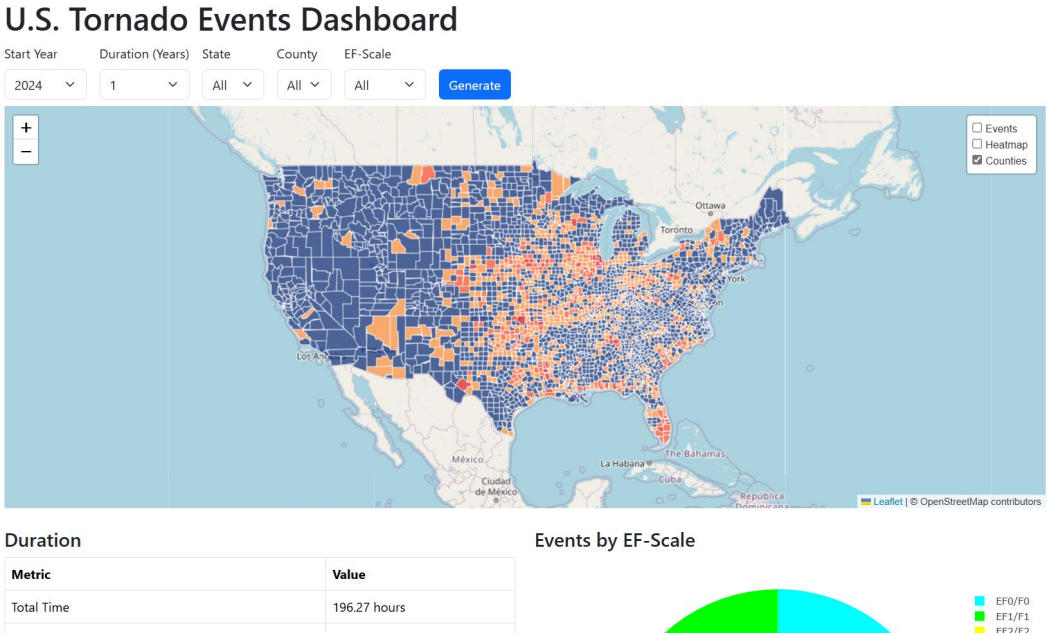
03 API

04 WEBSITE OVERVIEW

WEBSITE TOUR

LINK:

https://d-burke-data.github.io/Project_03/



DATA SETS USED

- https://www.ncdc.noaa.gov/stormevents/

- https://github.com/plotly/datasets/blob/master/geojson-counties-fips.json

ETHICAL CONSIDERATIONS

This project is based on a publicly available dataset, ensuring transparency and accessibility of the data used. As the dataset is open to public use and does not contain personally identifiable or sensitive information, no ethical concerns were identified.

DATA CLEANING

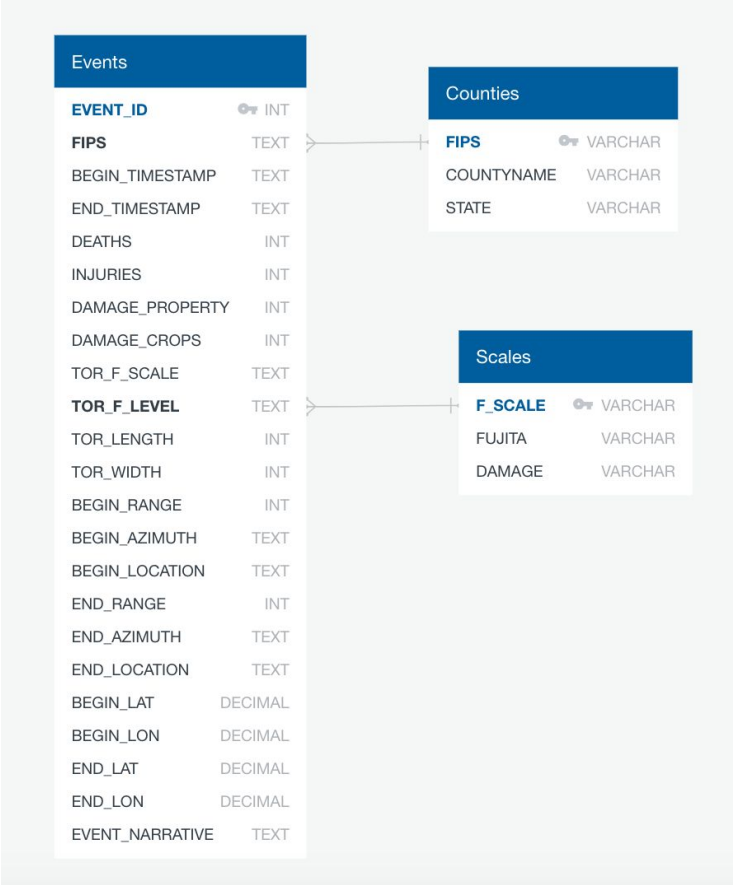
- Data from NOAA in 75 files (1950-2024) in CSV format
  - 1.47 GB
- Filtered by tornado events
  - Events are tornado “segments”
- Cleaned and combined FIPS (Federal Information Processing Standards) data
- Converted datetimes to UNIX integer timestamps, normalized to UTC time
- Converted property & crop damage values from text to integer
  - E.g., “25K” —> 25000
- Removed unnecessary columns and output to a single CSV for database import
  - 24 MB
  - 78,497 rows

DATA CONSISTENCY

- Not all events contain all data fields
- Older events more likely to have missing data
- Fujita F-scale used until 2007, when EF-scale was adopted
- Event data may not match county data

DATABASE

- SQLite used for the back end
  - Transportability
  - Easy remote hosting
- Hosted on Python Anywhere
- Tools: SQLite3, Python



API

- Tools: Flask, SQLAlchemy
- Flask App Hosted on PythonAnywhere

- Main Routes:
  - https://bmitri.pythonanywhere.com /api/v1.0/**events**
  - https://bmitri.pythonanywhere.com /api/v1.0/**dashboard**
- End Points:
  - Required:
    - Start_year
    - Duration (in years)
  - Optional:
    - State
    - Fip (county ID)
    - Scale (EF Scale level)

WEBSITE OVERVIEW

- RESOURCES TO BUILD WEBSITE:
  - HTML
  - BOOTSTRAP
  - D3
  - LEAFLET
    - Plugin for Counties Heatmap:
      - https://github.com/timwis/leaflet-choropleth
    - Plugin for Heatmap:
      - https://github.com/Leaflet/Leaflet.heat
    - Plugins for Event Map:
      - https://github.com/slutske22/leaflet-arrowheads (directional lines)
      - https://github.com/makinacorpus/Leaflet.GeometryUtil (required for Arrowheads)
      - https://github.com/rowanwins/Leaflet.SvgShapeMarkers (fast, simple markers)
  - PLOTLY
  - JAVASCRIPT

Questions?

THANK YOU