

Demographics
of Disaster

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Goals

Background

Approach &
Process

Finding &
Cleaning Data

Analyses

Product &
Results

The Demographics of Disaster

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DS421
University of California, Berkeley

Spring 2016

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Build programming skill sets

- R
- LaTeX
- Git
- Python

Create a reproducible, interactive final product

- Shiny app
- Report

Inspiration

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- A theoretical question:

Given the many environmental risk factors in the U.S.,

Where are human populations concentrated?

How does exposure to risk vary across race and income?

Approach

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Look for correlations between demographic subsets and level of exposure to environmental risk

Scope:

- Contiguous U.S. at the county level
- Most current data available; 2014

Process: Natural Disaster

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Risk types:

- Hail
- Wildfire
- Hurricane
- Wind
- Tornado

Process: Demographics

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Demographic delineations at the county level:

■ Race:

- African-American/Black
- Asian
- American Indian
- Native Hawaiian/Pacific Islander
- Hispanic
- Non-Hispanic White

■ Income & Employment:

- Median household income
- Percent below poverty line
- Unemployment rate

■ Population:

- Population density
- Land area

Finding & Cleaning Data

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- Found data on disasters & demographics
- Converted it to .csv files and cleaned it
- Standardized geopolitical unit (county)
- Combined data into master table

Project Workflow

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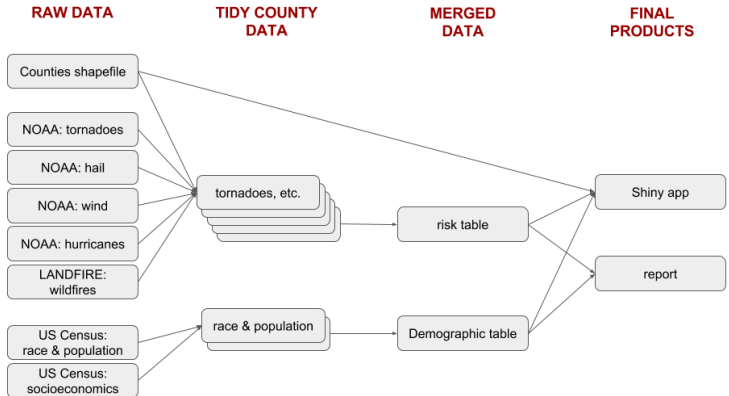
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Data Limitations

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- 1 Availability
- 2 Format usability
- 3 Sub-county variation
- 4 Widely varying county sizes

Examples

- Heat waves: limited data availability
- Flooding data: resolution too fine
- Large counties in California spanning climates and risk types

Variation in County Size

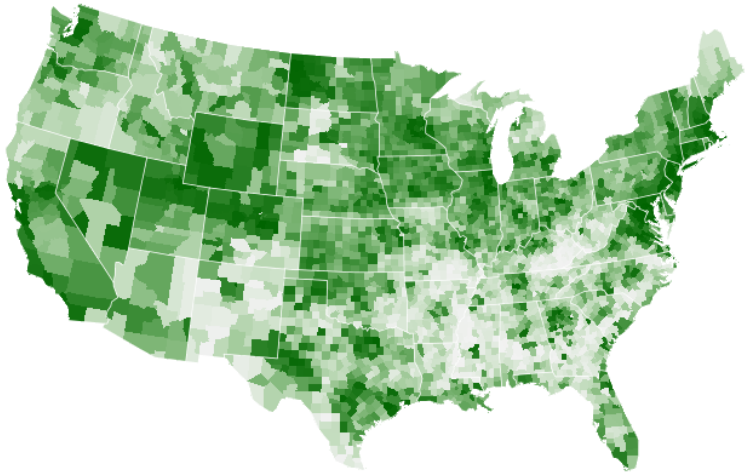


Figure 1: Median household income variation across counties of drastically different land area.

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Product &
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Cumulative risk index:

- Distributions of risk factors were considered
- All risk factors standardized and summed (fire, wind, hail, tornado, hurricane)

Created a Shiny app displaying correlations between each variable

Product & Results

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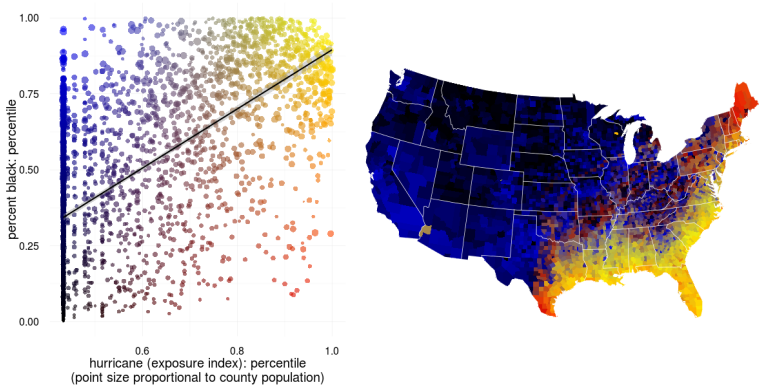


Figure 2: Example correlation and heat map of percent black vs. hurricane exposure risk made through the Shiny app.

Product & Results

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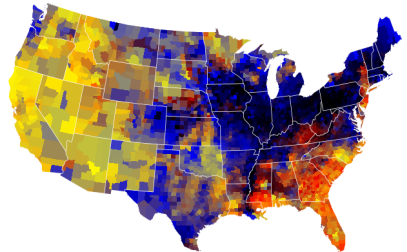
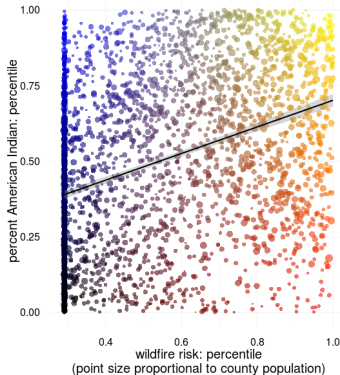


Figure 3: Example correlation and heat map of percent American Indian vs. wildfire risk made through the Shiny app.

[Click here to explore more correlations on the Shiny app.](#)