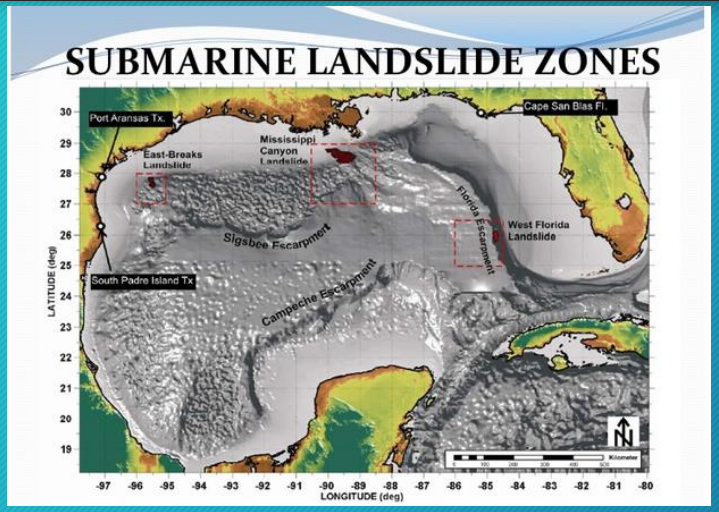
Tsunami Risks for the State of Florida Due to a Collapse of the Mississippi Canyon



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GIS3043 Final Project

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Introduction

- Potential flood zones for the state of Florida if there were to be a collapse of the underwater Mississippi Canyon in the Gulf of Mexico.

- Keywords:
  - All counties along Gulf Coast of Florida
  - Sea Level, 4ft, 7ft, 27ft intervals
  - Raster Files

Image Credit: https://websites.pmc.ucsc.edu/~ward/Gulf-tube.mov

Project Background

Potential for failure & possibility of a tsunami

- To provide an overview of the potential effect of flooding due to submarine canyon collapse.
- Sufficient evidence to suggest tsunami danger for the Gulf Coast
- Between 7ft & 50ft wave heights
- Average run-up = 10 miles

The Project Objectives

- Isolate Florida counties along Gulf Coast
- Identify each county seat
- Assess the elevations of counties
- Run a model showing flooding associated with tsunami at different intervals.

Study Area

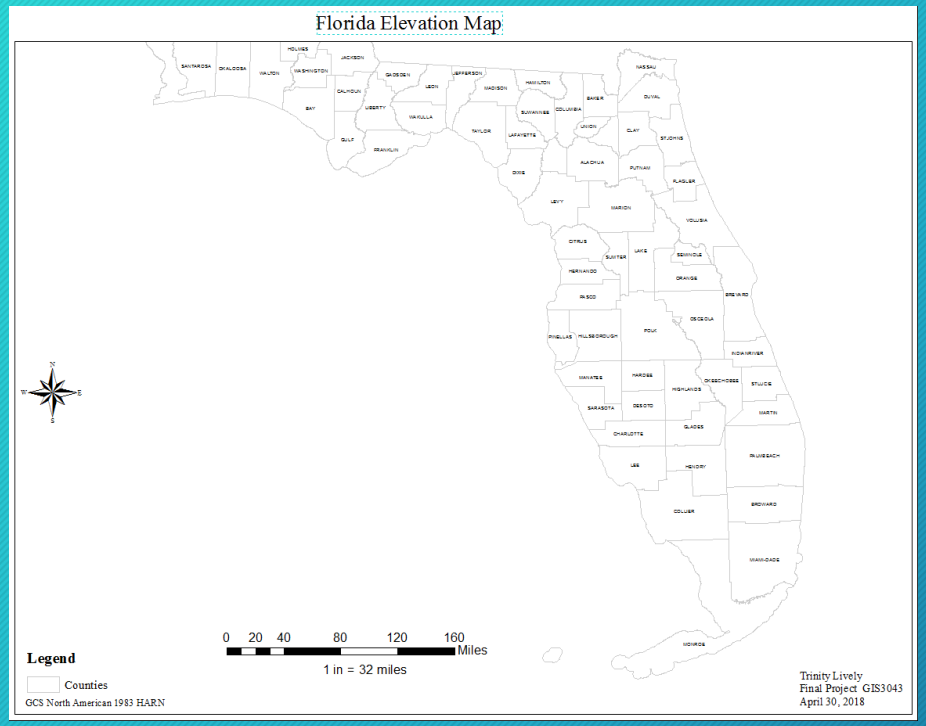
- The state of Florida
- Gulf Coast counties of Florida
- Sea Level, 4ft, 7ft, & 25ft wave heights

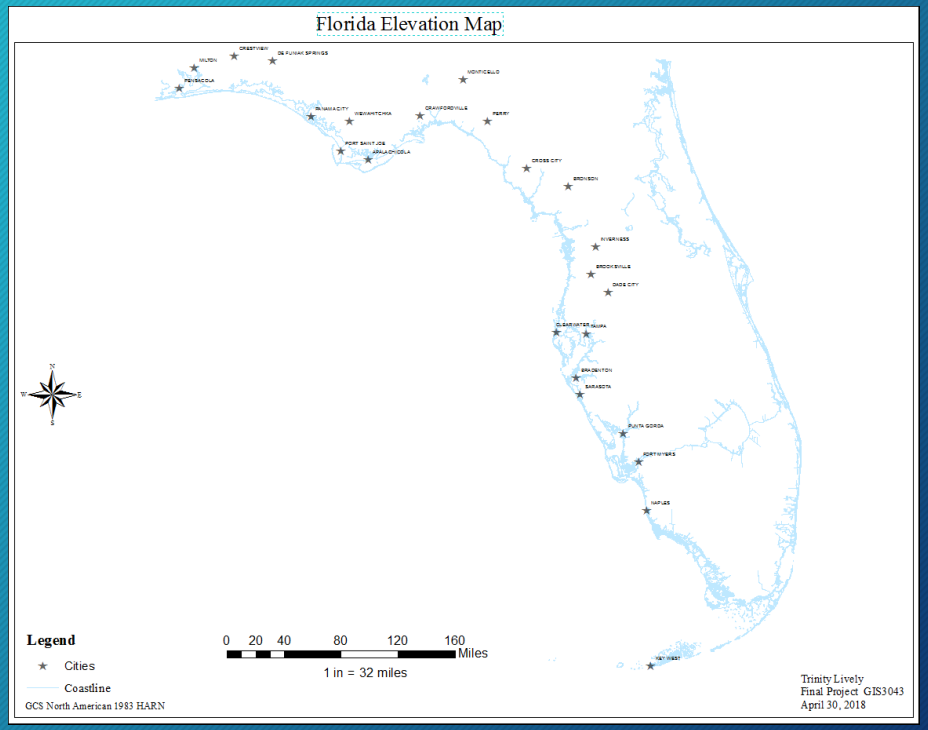
Image Credit: https://geology.com/county-map/florida-county-map.gif

Project Data Outline

Layers	Format	Data source	Brief Description
Background layer	Shape file	http://www.fgdl.org	Outline map of the state of Florida with county boundaries.
Coastal Boundary	Shape file	http://www.fgdl.org	Coastal boundary
City listing	Shape file	http://www.fgdl.org	Cities of Florida
Elevation layer	Raster file	http://geodata.dep.state.fl.us/datasets/elevations-contours-and-depression?geometry=-99.131%2C24.364%2C-68.721%2C31.163	Elevation data for the state of Florida

Illustrations of the data layers





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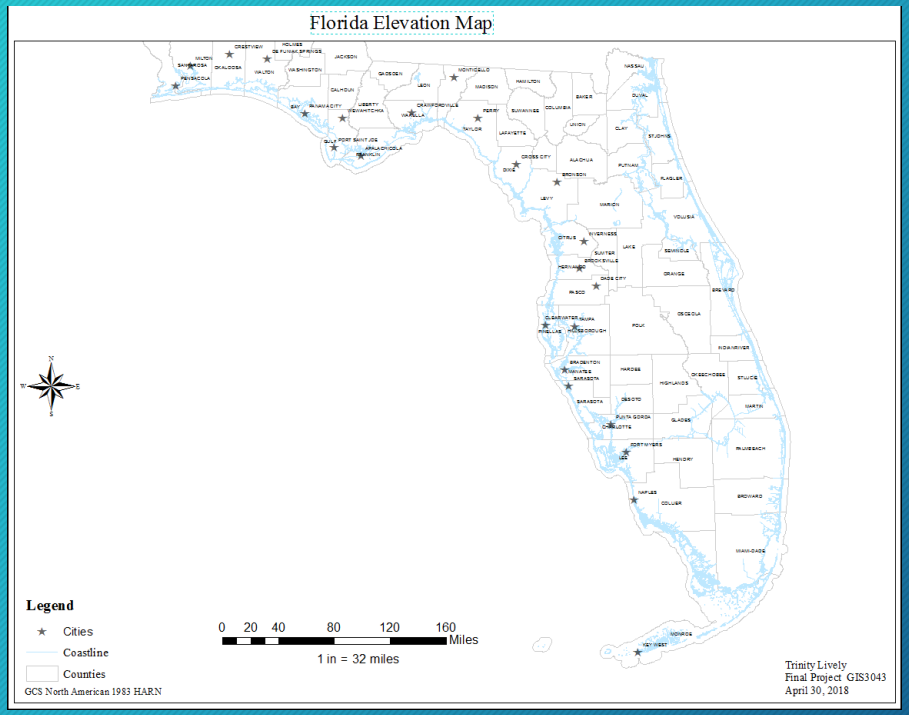
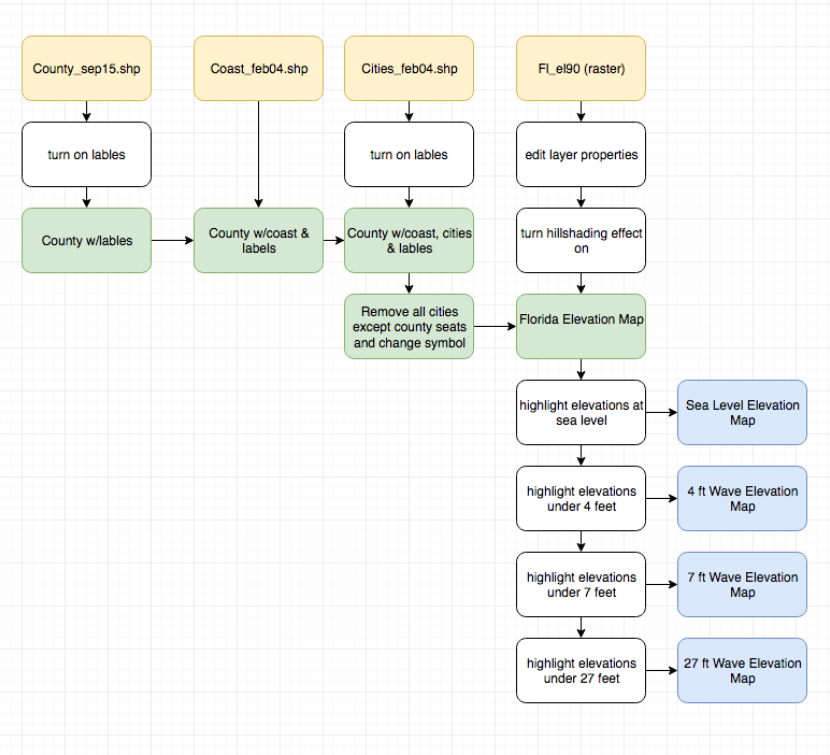


Overview of the Methods

Methods	Usage
Projection	Make all layers in the same projection
Spatial join	Join the layer of counties, state & shoreline.
Elevation	The elevation map will show terrain variances throughout the state
Hillshading	Hillshading will be turned on to shadow the topography

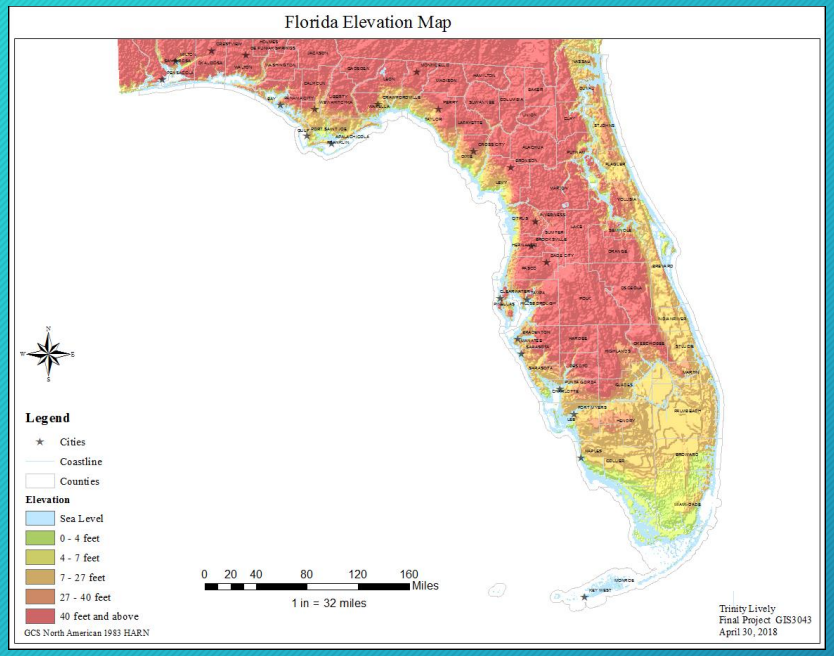
Flowchart of methods

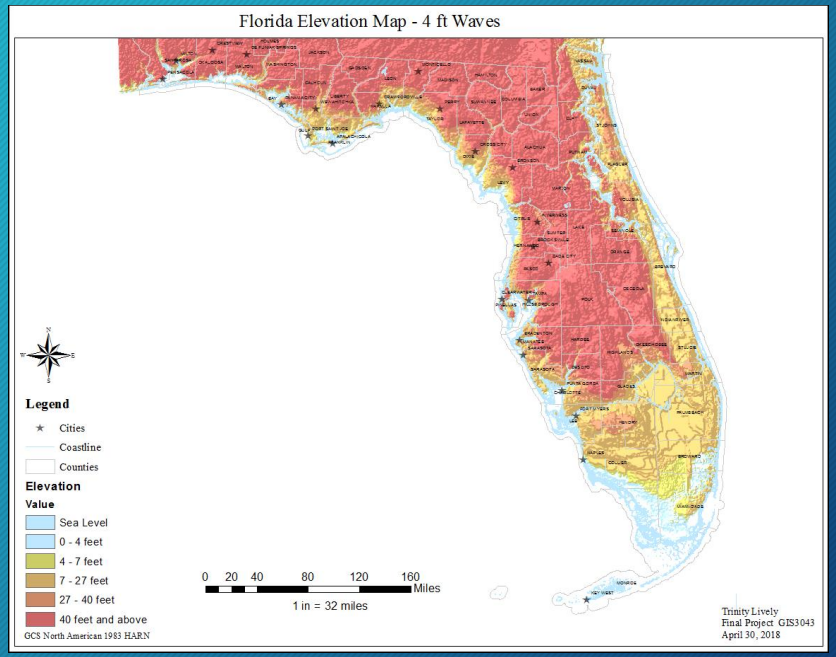


Results

- Florida Gulf Coast counties are in danger of flooding in the event of a tsunami.
  - 4ft waves
    - Marion, Naples, Lee, Sarasota, Pinellas & Citrus
  - 7ft waves
    - Franklin, Levy, Wakulla, Taylor, & Dixie
  - 27ft waves
    - All counties along Gulf Coast will see significant flooding

Screenshot of the results





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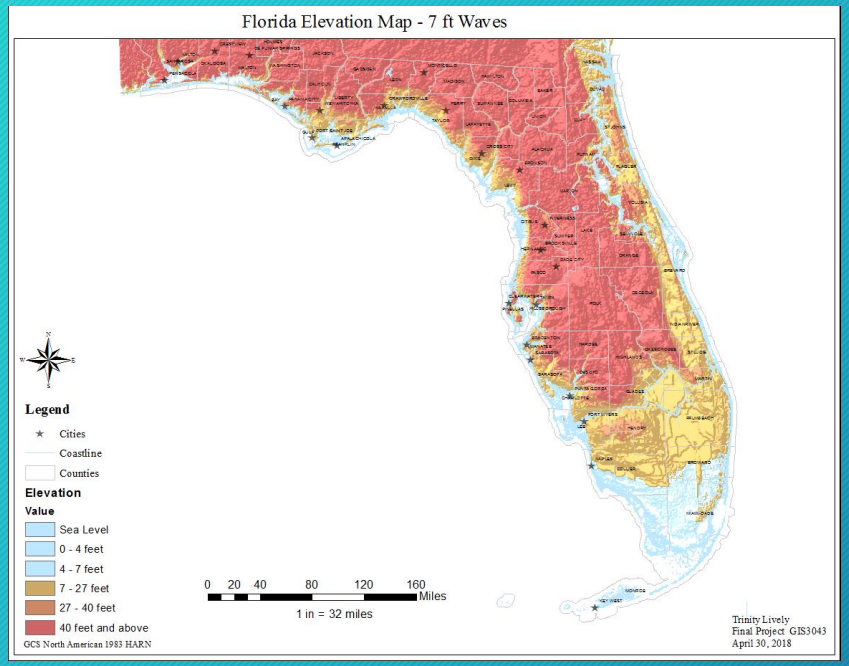

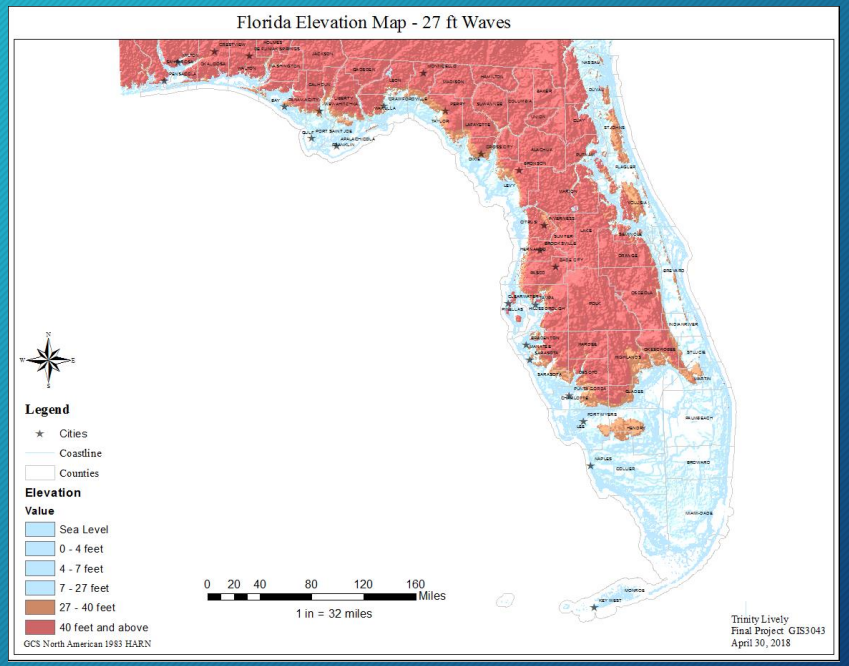

Limitations

- Lack of full data
  - There are few full state elevation maps available to the public for free.
- Time
  - Gathering each county's data and combining them is very time consuming
- Lack of knowledge
  - Skills not known fully

Self-evaluation

- 25 hours total
- Lack of knowledge of most functions
  - Google and ArcGIS help
- For my ability, I am satisfied
- More could be done to improve project

Work Cited

- http://www.nola.com/environment/index.ssf/2014/03/underwater_landslide_in_gulf_c.html
- https://geology.com/county-map/florida-county-map.gif
- https://websites.pmc.ucsc.edu/~ward/Gulf-tube.mov
- ten Brink et al. “Regional Assessment of Tsunami Potential in the Gulf of Mexico.” 2009. PDF File