Sea Level Rise

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GIS Algorithms and Data Structures
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Background refresher

- Sea level is RISING!
- We read many papers, finally came down to two algorithms
  - Watershed
  - Coastline
- Decided to implement coastline

Goals

- Implement algorithm for modelling sea level rising using coastline identification method
- Visualize change in sea level
- Add on as much as time permits!
  - Model hazard zones (hurricane, tidal waves, etc.)
  - Add transparency rendering code so as to model "before" and "after" ocean graphics
  - Take year as input
  - Any speed-ups

Challenges

- Stack overflow
- Working with a render code that was previously written
    - Having to both understand and advance it
- Handling weird ASCII data inputs
    - Some of the data sets we used had "-1.#IND" at certain points instead of NODATA or floats...what is dis?
    - Caused weird render bugs

Computational Run time

- Parameters: Rise of 5 meters
- Tested on North Carolina Coastal DEM (http://geodata.lib.ncsu.edu/NCElev/)
  - On grid of 36 million cells: 21.3 seconds
  - On grid of 80 million cells: 49.2 seconds
  - On grid of over 161 million cells: 69.344 seconds

Results

Real world applications

- Similar models could be used to predict and plan for the inevitable climate change of the future