MEAN SEA LEVEL TRENDS IN THE NORTH ATLANTIC AND GULF REGIONS OF THE US

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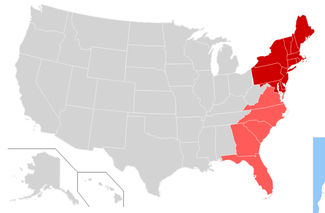
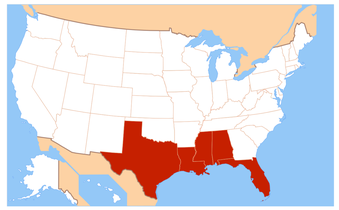
HOW DO THE MEAN SEA LEVEL TRENDS OF THE NORTH ATLANTIC REGION OF THE US COMPARE WITH THOSE OF THE TROPICAL AND GULF REGION OF THE US?

- **My hypothesis:** greater rise in sea level in tropical and gulf region
  - Warmer climate
  - Thermal expansion of ocean

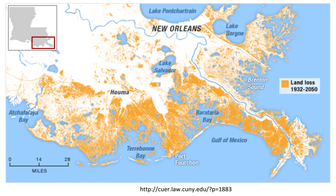




WHY DO WE CARE ABOUT RISING SEA LEVELS?

- 8/10 largest cities in US located near a coast
  - Storm surges
- Destruction of wetland habitat
- Contamination of soil
- Erosion
- The list goes on…

http://betterwaterfront.org/?page_id=2445

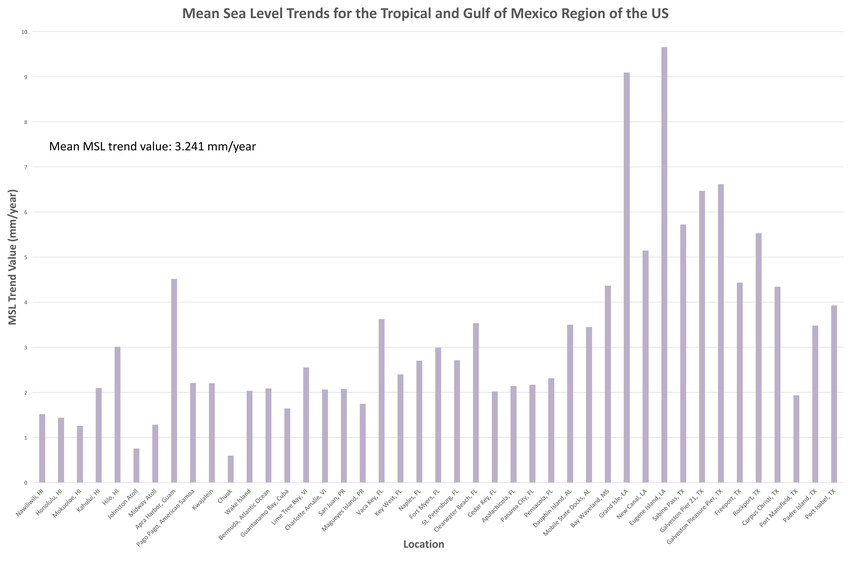


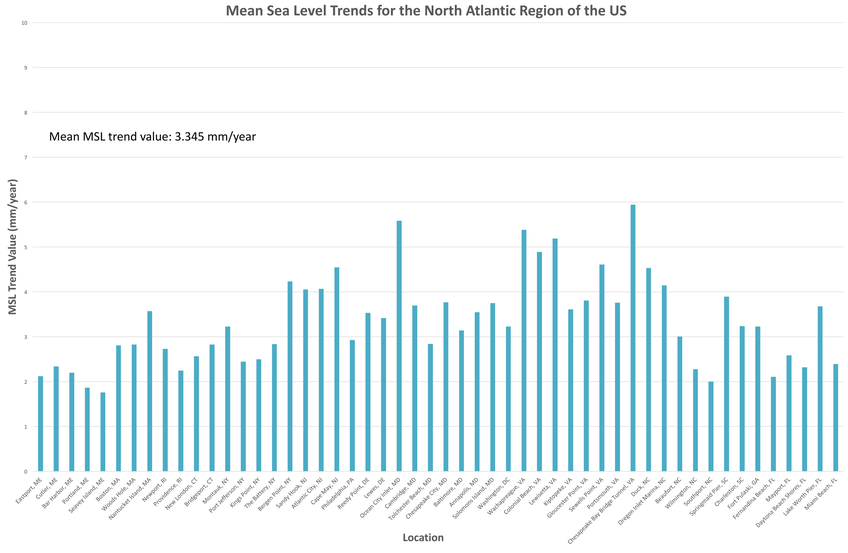
http://cuer.law.cuny.edu/?p=1883

https://www.americangeosciences.org/critical-issues/floods

METHODOLOGY

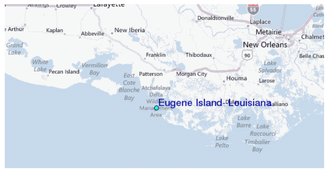
1. Obtain MSL data from NOAA Tides and Currents Website.
   a. Select “North Atlantic Region” from drop down menu below “US Regional Trends.”
   b. Click “export to CSV” under each graph.
2. Combine data from each Excel file so all data points are on the same document.
3. Select all data and insert bar chart.
4. Label vertical and horizontal axes “MSL trend value” and “Location” respectively.
5. Adjust axis scale so the minimum value is 0.0 and the maximum value is 10.0.
6. Calculate mean MSL trend value for each region.
7. Compare graphs and means of each region and evaluate the results to reach a meaningful conclusion.

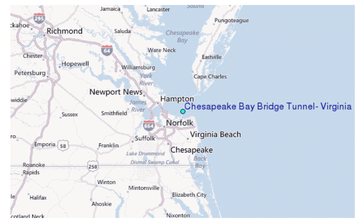




CONCLUSIONS

- Higher MSL trend value for North Atlantic Region
  - 3.345 mm/year vs. 3.241 mm/year
  - Contradicts hypothesis
- Eugene Island, LA-9.654 mm/year
- Chesapeake Bay Bridge Tunnel, VA-5.942 mm/year
- Both locations surrounded by water

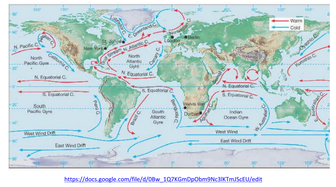




https://www.tide-forecast.com/locations/Chesapeake-Bay-Bridge-Tunnel-Virginia

IMPLICATIONS

- Rising sea levels affect regions in different ways
  - Ocean currents
  - Local topography
- **Louisiana**
  - Ancestral delta lobes
  - Sediment and barrier islands eroded, loss of wetland
  - Oil and gas extraction
- **Chesapeake Bay**
  - Post-glacial rebound pushing land down
- **Future impacts:**
  - Higher rise in sea level if West Antarctic ice sheet melts
  - Gravitational pull on sea will lessen
  - Ocean currents carry water to East Coast



https://docs.google.com/file/d/0Bw_1Q7KGmOpObm9Nc3lKTm5cEUj/edit

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