Economic Conditions and Challenges facing Sea-Level Rise in Southern New Jersey and Eastern Shore Maryland Counties

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Introduction

As sea levels gradually rise globally, planners have been put up to the task of adapting their communities to the changing landscape. In this work, we focus on two local regions: Southern New Jersey and Eastern Shore Maryland.

These communities face an exacerbated form of this problem due to small land areas, concentration of revenue-generating uses on their coasts, and the potential for mass displacement of workers who live in the flood risk area.

A lack of action to effectively mitigate the effects of sea level rise will leave residents displaced and municipalities without the revenue necessary to take care of their remaining populations. Without proper planning and foresight, communities seen as beacons of economic prosperity can quickly become massive liabilities. This project aims to examine how demographic and economic trends intersect with climate risks like sea-level rise, and what this means for local fiscal and planning challenges.

Study Area
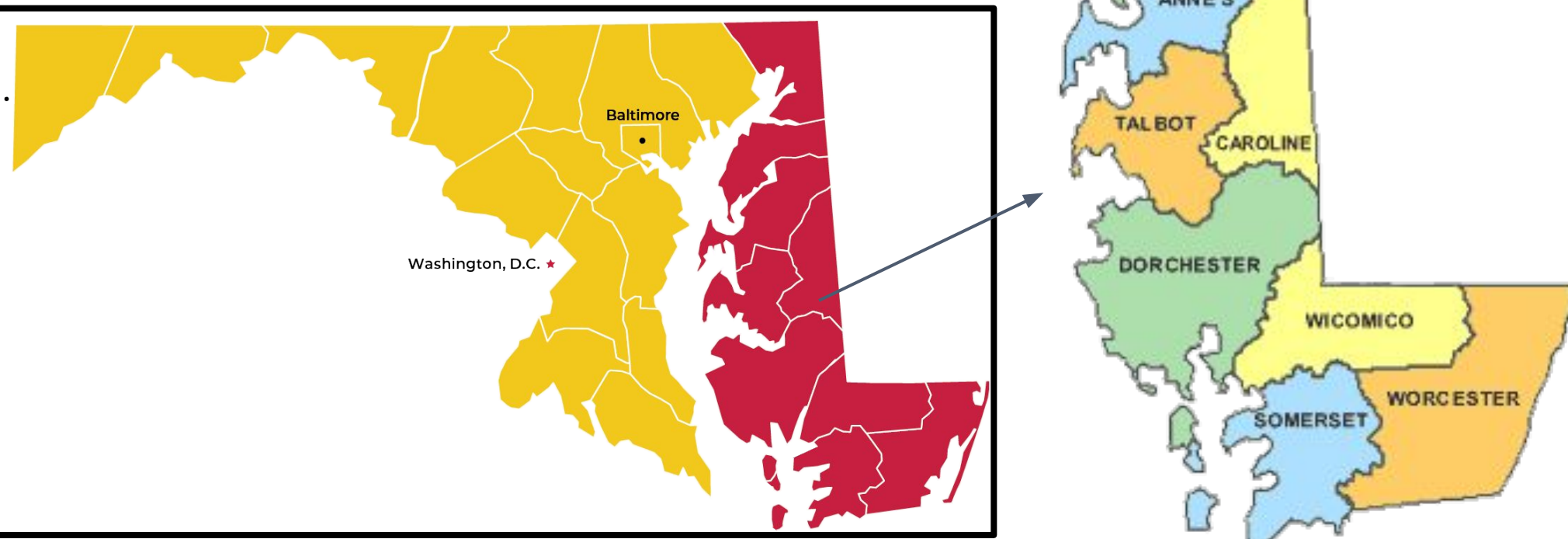
Map of Maryland (credit: business.maryland.gov)

Eastern Shore Maryland Counties: Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, Worcester
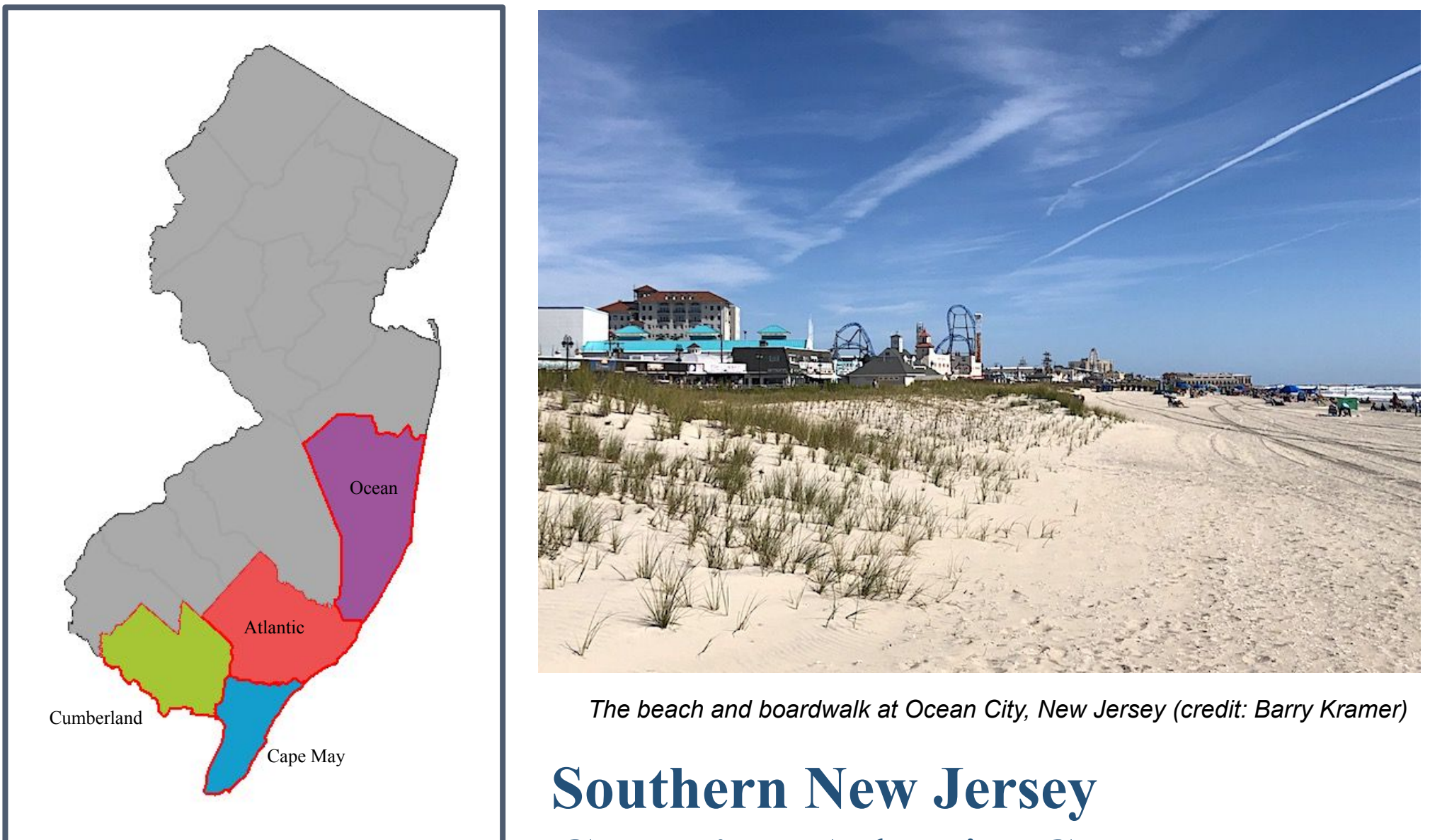
Map of Study area within New Jersey.

The beach and boardwalk at Ocean City, New Jersey (credit: Barry Kramer)

Southern New Jersey Counties: Atlantic, Cape May, Cumberland, Ocean

Data & Methodology

In order to understand the economies of these regions and which counties would be most affected, I created employment base analyses for each county. For New Jersey, these counties include Cape May, Cumberland, Ocean, and Atlantic. For Maryland, they are Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester. These analyses covered location quotient, shift share, and population projection. The data for all of these analyses came from the U.S. Census Bureau.

The location quotient tells us which sectors a region specializes in compared to the larger state or country. NJ counties such as Atlantic and Cape May have high accomodation (tourism) LQs, signalling a higher concentration of that sector compared to the state and country. The majority of MD eastern shore counties have high manufacturing LQs, telling us manufacturing is very significant in the region.
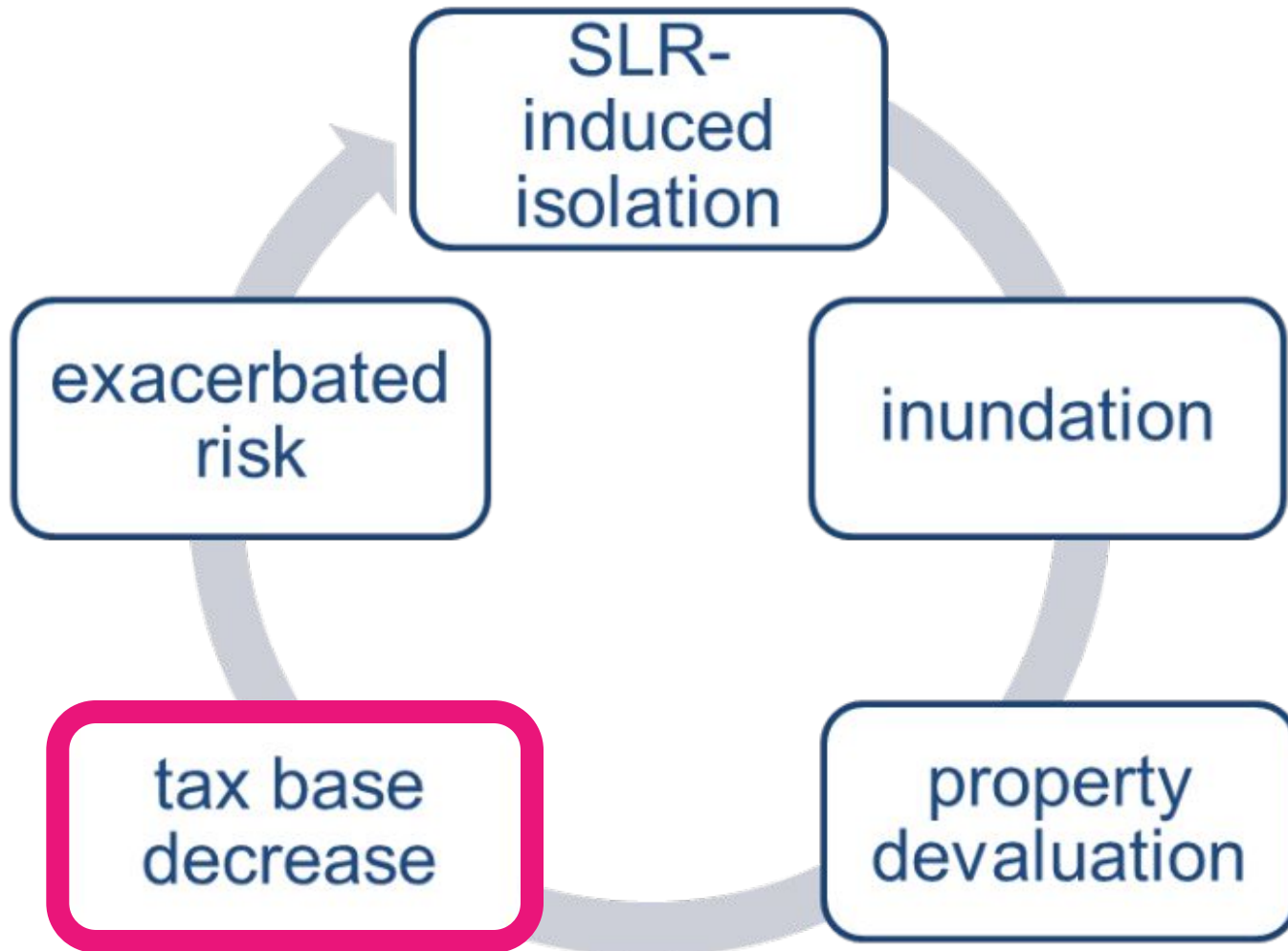
- A shift share analysis helps us understand the factors that are affecting the industries in the region, whether it be national trends or unique local circumstances.
- The relative concentrations for each county (LQ) match up fairly well with their growth rate (SS). This information tells us which industries are the most important for each county, and what can happen if those industries are significantly downsized due to sea level rise. See example below:

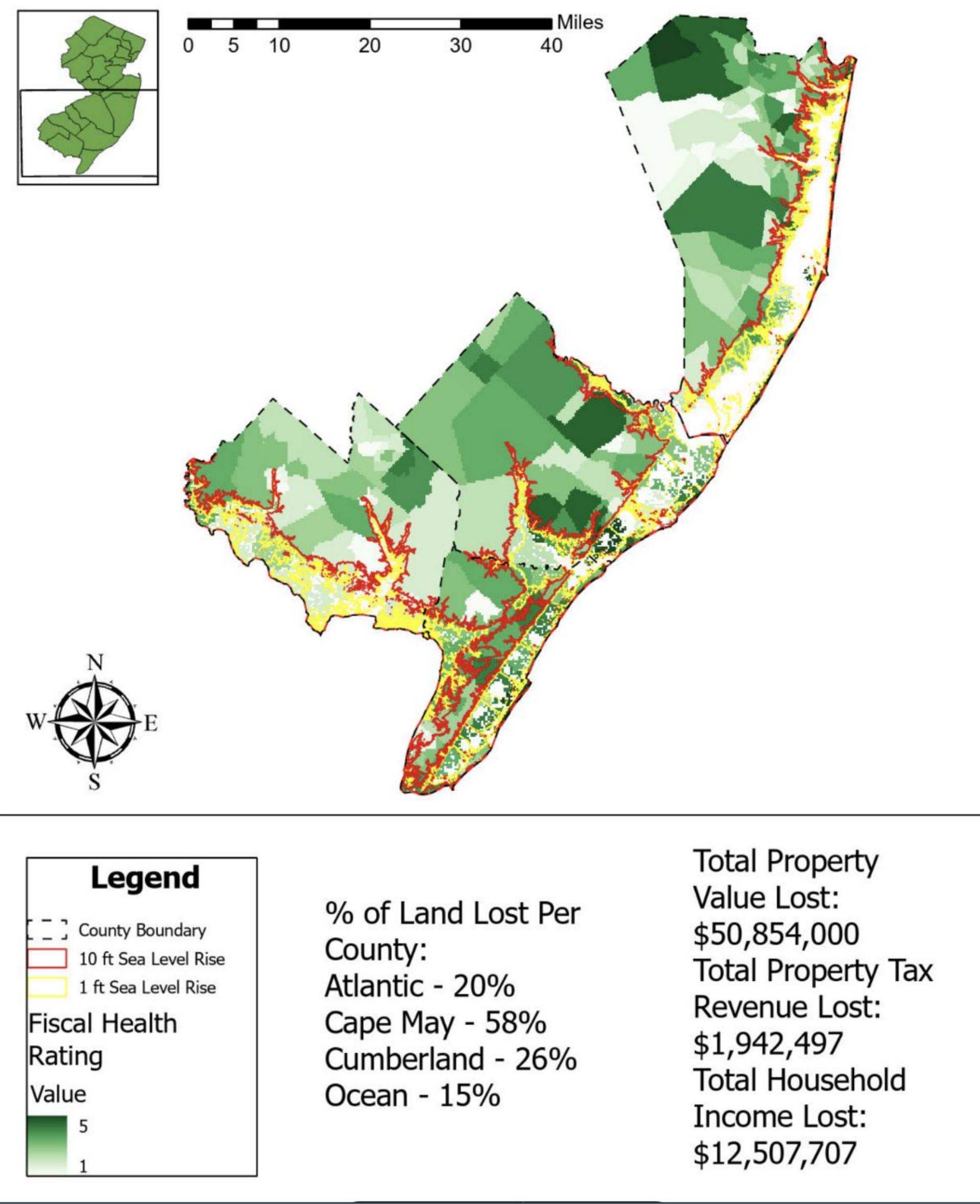Location Quotient for Atlantic County, New Jersey (2022)
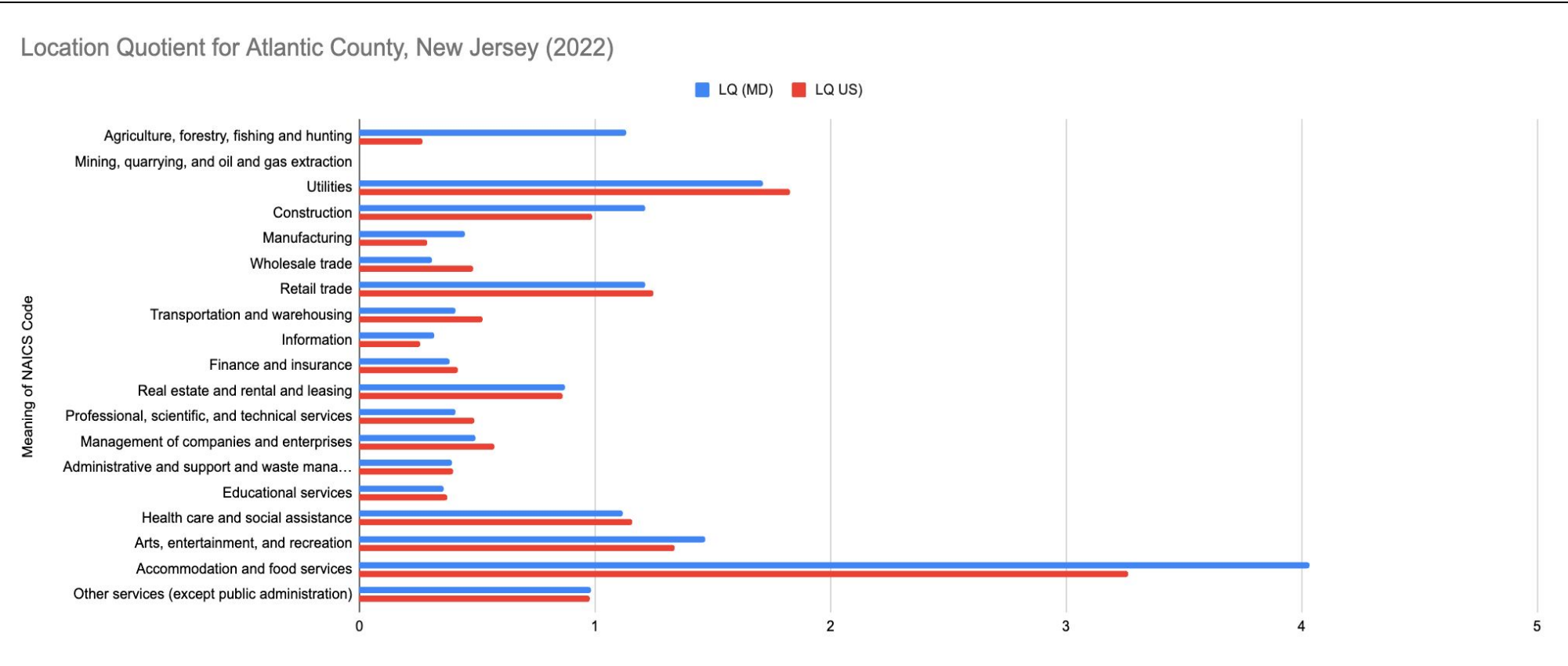
Results

Both studied regions have significant challenges in the near future if the issue of sea level rise is not adequately addressed.

- For Southern New Jersey, coastal tourism and residential properties will be affected and either be forced to move or shut down altogether.

- For Eastern Shore Maryland, manufacturing will take a hit in employment numbers due to those who live near the water needing to relocate.

Both of these results will end up leaving their respective municipalities without a major source of income and significant financial strain. This revenue will need to be recouped somehow, most likely through increased taxes for residents. This will compound the emigration problem and leave many communities as a shell of their former selves.

Fiscal Impacts of Sea Level Rise On Coastal Communities in Southern New Jersey

Legend
County Boundary
10 ft Sea Level Rise
1 ft Sea Level Rise
Fiscal Health Rating
Value 5 / 1

% of Land Lost Per County:
Atlantic - 20%
Cape May - 58%
Cumberland - 26%
Ocean - 15%

Total Property Value Lost: $50,854,000
Total Property Tax Revenue Lost: $1,942,497
Total Household Income Lost: $12,507,707

Map of Fiscal Impact of Sea Level Rise On Coastal Counties in Southern New Jersey

Takeaways & Next Step

- South Jersey and Maryland's Eastern Shore face shared economic risks from projected sea-level rise, threatening residents, businesses, and municipal stability.

- While these challenges can't be solved locally alone, proactive planning—such as future-proofing infrastructure—can reduce harm and avoid displacement.

- Continued public awareness must be paired with concrete mitigation strategies to prevent economic decline.

- Planners in these and similar regions must lead in advancing climate-resilient solutions and educating communities to safeguard their future.

- This is part of an ongoing effort to evaluate the economic risk facing sea-level rise. Quantitative analysis and community engagement works are still unfolding.

References

United States Census Bureau. (2020). Explore census data. Explore Census Data. https://data.census.gov/

Best, K., He, Q., Reilly, A.C. et al. Demographics and risk of isolation due to sea level rise in the United States. *Nature Communication.* 14, 7904 (2023). https://doi.org/10.1038/s41467-023-43835-6

Logan, T.M., Anderson, M.J. & Reilly, A.C. Risk of isolation increases the expected burden from sea-level rise. *Nature Climate Change.* 13, 397–402 (2023). https://doi.org/10.1038/s41558-023-01642-3

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