



PLANNING FOR A

Changing Ocean

Climate Change and the Mid-Atlantic's Ocean Economy

No place along the Mid-Atlantic coast will be spared from the potential impacts of climate change. With everything from jobs to the housing market tightly bound to ocean-dependent industries, every coastal community, whether beachfront or further inland, is at risk.

The challenges are especially pronounced in the Mid-Atlantic, the most densely populated stretch of coastline in the country. The region's waterfront is home to America's largest city, New York; two of its busiest ports in New York/New Jersey and Hampton Roads; and iconic beach destinations that have entertained summer tourists for decades.

The *Planning for a Changing Ocean* project analyzed potential economic impacts from climate change and associated trends such as sea level rise, warming sea temperatures and ocean acidification forecast for 2100. The study examined the value of potentially vulnerable assets across several key sectors such as tourism and travel, transportation, and commercial and recreational fishing.

About the Project

Planning for a Changing Ocean aimed to understand how a changing climate impacts our ocean and the Mid-Atlantic's diverse marine ecosystems, coastal communities and economies. The project examined the implications for resilience of current trends, including increased acidification of coastal and ocean waters, the availability of offshore sand resources and shifting marine life habitats. The project was a collaboration of the **Mid-Atlantic Regional Council on the Ocean (MARCO)** and the **Monmouth University Urban Coast Institute (UCI)**, made possible by a grant from the **National Oceanic and Atmospheric Administration (NOAA)**.

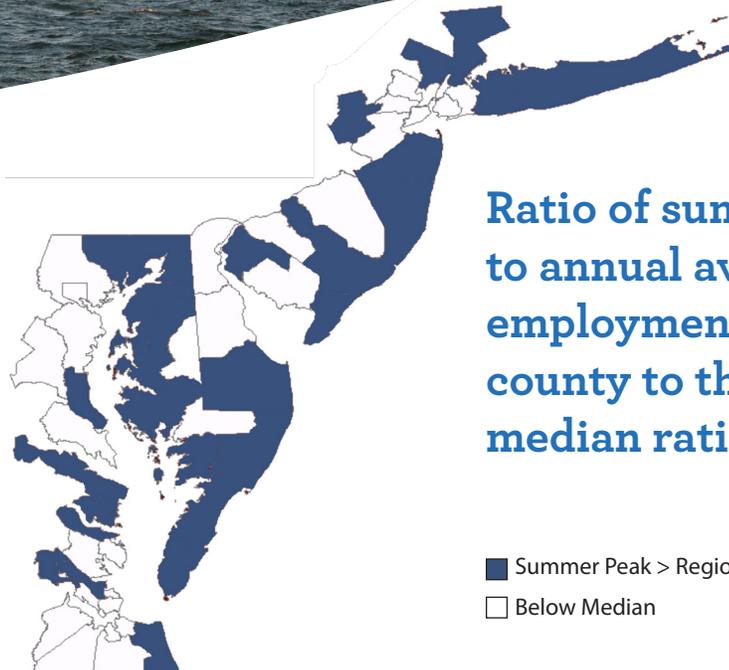


For more information, view our full report **Climate Change Vulnerabilities in the Coastal Mid-Atlantic Region** at MidAtlanticOcean.org.



Among the study's findings:

- Some places have greater vulnerability than others. Areas such as the New Jersey and Long Island shores, the Lower Delaware Bay, and the Chesapeake Bay carry heavier risk because of their economic reliance on seasonal populations. The sources of vulnerability vary from jobs to housing to infrastructure and social characteristics. Tourism and recreation accounts for 78% of ocean economy employment in the Mid-Atlantic.
- For maritime industries, there is a significant threat to land-based operations, as ports require ample land for containers, warehouses and transportation connections. These industries may provide an estimated 120,000 jobs and \$20 billion in GDP by 2030. While beyond the scope of the study, additional vulnerabilities are assumed for roads, bridges and railways.
- Fisheries industries and government have a limited ability to adapt to what could be rapid shifts in the habitats of critically important species. From Maine to North Carolina, a 25% loss of catch is possible for species affected by climate change, which could translate to a 20% decline in annual value.



Ratio of summer peak to annual average employment in each county to the regional median ratio.

- Summer Peak > Regional Median
- Below Median

Opportunities for Resilience

Many communities, industries and government agencies are rising to the challenge, taking steps to bolster their waterfront defenses with both natural and engineered solutions. They are finding that there are opportunities to act now, even while funding is limited.

- **The Panama Canal** expansion has been an effective catalyst for improving the readiness of ports' infrastructure, as improvement projects like the raising of the Bayonne Bridge in New Jersey/New York are considering sea level rise in their designs. In order to provide a more complete picture of potential vulnerability, additional further research and analysis of associated infrastructure should be completed.
- **Coastal wetlands** restoration projects such as planting marsh grasses are showing great promise for stemming climate impacts. During Hurricane Sandy, living shorelines reduced coastal property damages by an estimated \$650 million in the Mid-Atlantic. Local governments and NGOs are leveraging funding to voluntarily implement these strategies across the region as a way to reduce their vulnerability to the impacts of coastal storms and sea level rise.
- **State and local governments** have acted pragmatically, by focusing on climate adaptation measures that prioritize immediate near-term threats to vulnerable assets.

Scientists have a general consensus on what kind of climate changes will impact the region, but the rate and magnitude is still unclear. By preparing for the most likely impacts today, Mid-Atlantic coastal communities may decrease the economic ramifications of a changing climate in the future.

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