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Integrating Vulnerability and Risk to Inform Climate Adaptation Action: An Applied Framework

Impacts from climate-driven hazards threaten coastal and inland communities and the ecosystem services upon which they rely. Many of these communities are densely populated, economically and culturally important, and entwined with environmentally sensitive habitats and green spaces. To better prepare for climate change, community and ecosystem vulnerability assessments are necessary to plan for and improve community resilience to climate hazard impacts.

Our Integrated Vulnerability Assessment Framework utilizes a geospatial approach to intersect vulnerability and risk through quantitative and qualitative analyses. While many vulnerability assessments focus on a single aspect of vulnerability and/or risk, our Framework identifies and develops a variety of both vulnerability and risk profiles. These can include social, physical, and environmental vulnerability, in addition to both coastal and inland risks, such as coastal flooding, sea level rise, stormwater flooding, wildfire, and erosion.

Initially implemented in the Chesapeake Bay area and since extended to Los Angeles County, California, our Framework can easily be applied to the Carolinas for a single community, statewide, or regional (Carolinas) assessments. The Carolinas are home to a diverse range of ecosystems, human populations, and climate impacts, and may benefit from an integrated assessment. Further, our Framework relies upon existing, publicly available data, such as U.S. Census Bureau data sets or the National Hurricane Center's storm surge modeling data. Our integrated approach provides the information needed for community planners to prioritize resources and areas for climate adaptation action.