

IMPROVING THE SURFACE WATER QUALITY OF COASTAL BASINS WITH RESILIENT LAND COVER SCENARIOS

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Coastal watersheds provide crucial water resources to coastal communities for various purposes, such as drinking, farming, fishing, and recreation. The coastal wetlands within these watersheds play a significant role in maintaining water quality by removing pollutants and reducing flood waters. Many coastal wetlands are currently facing threats due to inland development and sea level rise (SLR). Previous studies have used land change and water quality models to predict changes in land cover, assess their impact on water quality, and test the effectiveness of management interventions. However, these modeling techniques have only been used in a limited capacity for sites in coastal watersheds. This has prevented regulators of coastal development from preparing for future changes in water quality and deploying appropriate management interventions. Therefore, this study will use land cover and water quality modeling to create future predictions that will identify the best ways to protect threatened wetlands so regulators can make informed decisions regarding their land use. The study will focus on the coastal watersheds of eastern Delaware because they contain important coastal communities and large swathes of threatened coastal wetlands.

First, future land cover and water quality predictions without any interventions will be created using TerrSet's Land Change Model and the Long-Term Hydrologic Impact Assessment model. The results will indicate the main drivers of historic coastal wetland loss, how current trends in SLR and land development will affect wetlands, and which portions of coastal wetlands are at greatest risk.

Next, the same models will be used to manually alter the future land cover predictions to mimic the application of land management interventions and gauge the subsequent impact on water quality predictions. The results will highlight which management interventions will help retain the most coastal wetland land cover and maintain current water quality standards.

PRESENTER BIO: Martha Ryan is a Ph.D. student at the University of Delaware with an interdisciplinary background in ecology, geospatial modeling, statistics, and regional planning. They are currently focused on improving the water quality of Delaware's coastal watersheds through land use intervention.