



# Visualizing Access and Land Use Change in Hurricane-Affected Landscapes through Web Cartography

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## Abstract:

As coastal landscapes face increasingly rapid transformation due to hurricanes and redevelopment, cartography offers a critical lens for understanding and communicating shoreline access's shifting visual, legal, and ecological dimensions. This research presents a cartographically driven framework for modeling and visualizing viewsheds in hurricane-prone communities along Florida's Gulf and Atlantic coasts. It emphasizes the design of maps that convey how sightlines to the coast intersect with multiple land use and property categories, highlighting the complexity of coastal planning and amenity access.

Using digital elevation models (DEMs), state-level land use/land cover data (FLUCCS), and cadastral property layers, we developed a GIS-based method to generate observation-based viewsheds, incorporating key angular metrics such as Maximum View Angle (MVA<sup>o</sup>) and Individual Property View Angle (IPVA<sup>o</sup>). The resulting viewsheds are expressed not simply as binary visibility maps, but as visual fields that interact with human-defined land use classifications and physical landscape features. Integrating land use and land cover data provides essential context, revealing how views are mediated by zoning, development, vegetation, and post-hurricane changes to shoreline morphology.

Cartography is essential to this work, not just for its analytical rigor but also for its ability to translate complexity into understanding. Each viewshed is designed as a spatial model and a visual narrative that speaks to planners, policymakers, property owners, and the public. A suite of cartographic outputs—including oriented imagery datasets, interactive web maps, and shoreline-focused visibility diagrams—demonstrates how changes to coastal viewsapes and adjacent land uses can be measured and meaningfully visualized in both plan and perspective views.

This research is presented at the International Cartographic Conference to support the International Cartographic Association's (ICA) mission of fostering the understanding, sharing, and application of cartographic knowledge. It contributes to key ICA themes of sustainable development, spatial justice, and educational innovation. It shows how thoughtful cartographic design can guide land use decisions and shape public conversation in disaster-impacted regions.

Web map and project viewer: <https://jderekito.github.io/ValidateViewsheds.html>

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