

# UNIVERSITY GRADUATE SCHOOL BULLETIN ANNOUNCEMENT

**Florida International University**  
*University Graduate School*

Doctoral Dissertation Defense

## **Abstract**

An Assessment of Climate Mobility Pressures in Response to Dynamic Sea-Level Rise

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Sea-level rise (SLR) and related flooding impacts will contribute to migration across coastal communities around the world. Differential exposure to impacts, societal vulnerability, and adaptive capacity will invariably lead to varying climate-related mobility outcomes for residents of these communities. Residents of Miami-Dade County (MDC), FL, USA are at substantial risk to the direct and indirect impacts of SLR and related flooding. As the 2nd most economically unequal metropolitan area in the U.S. according to the Gini coefficient (0.508), without strategic intervention, marginalized and vulnerable communities across MDC will disproportionately face unequal mobility pressures. This dissertation seeks to understand the potential drivers of climate-related mobility and its impacts on residents. I developed a framework to distinguish between differential pressures for SLR related mobility to categorize residents into four potential outcomes: (1) *stable*, (2) *migrating*, (3) *displaced*, (4) *and trapped*. Using this framework, I observed how SLR-related mobility pressures could impact current MDC residents through (1) a quantitative assessment of potential drivers of climate mobility, (2) semi-structured interviews with residents, and (3) a county-wide survey to assess household preferences for SLR adaptation and mobility. I categorized residents into one of the four mobility categories by first assessing exposure to inundation and extreme flooding (1% annual chance) flood risk under scenarios of increasing SLR using a fast-response, regional model that produces street-level flood depths, or PRIMo. I combined this information with an assessment of social vulnerability generated through a model-based clustering approach. Results suggest up to 68% of current residents could face immobility pressure under high SLR scenarios, while 6.1–9.5% of current residents could face climate-related displacement pressures resulting from increased desirability for safer, more resilient development. Through interviews with residents ( $n=40$ ), I documented high frequencies of pluvial flooding across the county, leading to ad-hoc adaptations and potentially higher willingness to move (75%) in response to future SLR impacts among residents. Results from the county-wide survey suggest that residents ( $n=597$ ) prefer adaptation even under scenarios of high-SLR, but residents who were less confident in their financial ability to deal with SLR preferred to move away. This dissertation highlights the unevenness of climate risks and raises considerable concern about the future of coastal communities and their residents, globally, if left unaddressed.

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