POLICY BRIEF

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Reduced Hazard Exposure through Growth Management? An Evaluation of the Effectiveness of Florida's Hurricane Hazard Mitigation Planning Mandates

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The vulnerability of human settlements to costly damage and destruction from natural hazards is widely viewed as an important constraint to local and global sustainability. Growth management strategies, such as land development regulation, capital facilities policies, land acquisition, taxation and fiscal policies, and information dissemination, are frequently advocated as effective non-structural means by which communities can reduce their vulnerability and enhance their sustainability. Despite the attention focused on the use of growth management strategies to mitigate exposure to natural hazards, there have been few rigorous analyses of the impacts that such strategies have had.

Background

Florida's 1985 growth management legislation requires local governments in coastal areas to prepare a coastal element as part of their comprehensive plans that addresses, among other goals, the state's intent to protect human life. The focus of the state regulations that detail the substantive content of the coastal element is on limiting development in and directing populations away from "coastal high-hazard areas" (CHHAs), the area evacuated in the event of a Category 1 hurricane and storms of greater intensity, and on maintaining or reducing hurricane evacuation clearance times within "hurricane vulnerability zones" (HVZs).

The first comprehensive plans developed under Florida's 1985 local planning mandate were adopted by local governments and approved by the state's Department of Community Affairs (DCA) between 1988 and 1991. Land development regulations and other growth management strategies implementing these policies have been adopted by local governments to varying degrees in the years following approval of the plans. Data collected by state agencies suggest, however, that development has continued in many coastal communities with resultant increases in exposure, vulnerability, and associated costs to local governments and the state.

Research Approach

Three hypotheses shape this research. The first is that the exposure of people and property to hurricane flooding increased significantly in some coastal communities during the period following approval of their comprehensive plans, despite the fact that these communities were mandated by the state to direct development away from their CHHAs and to maintain or reduce evacuation clearance times within their HVZs. The second is that growth rates within CHHAs were, on average, slower after the approval of local comprehensive plans than they had been during a comparable period of time prior to comprehensive plan approval. Our third hypothesis is that growth rates within CHHAs, following approval of local comprehensive plans, were, on average, slower than in areas outside theses hazardous areas.

For this project, we investigated the effects of changes in land use on the exposure of people and property to hurricane flooding in 89 coastal communities in 15 Florida counties. We compared residential development patterns in 2002 with developed residential land use prior to implementation of local comprehensive plans that were approved by the Florida Department of Community Affairs between 1988 and 1991. The primary data inputs for this work include parcel polygons and property appraiser records for all properties in our 15 counties. With this information we were able to determine the location, intensity, and value of residential development in our jurisdictions of interest.

Has Exposure to Hurricane Flooding Increased Despite the Adoption of Local Government Comprehensive Plans?

Yes. Our analyses show that despite the state's coastal planning mandate, substantial increases occurred in residential exposure to hurricane flood hazards following the approval of local comprehensive plans. Rough extrapolations from our analyses of 88 communities in 15 of Florida's 35 coastal counties indicate that approximately 425,000 new residential units were constructed within the combined area of the CHHAs and HVZs in the state between the years in which individual comprehensive plans were approved in 2002. These new residential units added approximately $80 billion in 2002 just value of property improvements within these hazard zones and exposed an additional 958,000 residents to the hazards of hurricane flooding.

Has the Rate of Increase in Exposure to Hurricane Flooding Decreased Since the Adoption of Local Comprehensive Plans?

Yes. Despite these increases in exposure, we found some evidence that residential growth within the most hazardous area, the CHHA, may have been moderated by local plan implementation. We found that post-plan approval residential growth within CHHAs was slower relative to that in areas outside of CHHAs. Table 1 reveals that the median growth rates within the CHHA fell substantially in the period after plan approval, from 67% to 14%.

Table 1. Median Growth Rates for Residential Units Before and After Plan Approval, Within and Outside of the CHHA

	Prior to Plan Approval	After Plan Approval	After/Prior Ratio
Within CHHA	67%	14%	0.21
Outside CHHA	77%	29%	0.34

n = 61 jurisdictions

Are Growth Rates within CHHAs Lower than those for Areas Outside of these Hazard Zones?

Yes. Table 1 also illustrates that median growth rates within CHHAs were lower than those outside of the CHHA, in both the pre- and post-plan periods. Further, while the pre-plan median growth rates inside versus outside the CHHA were somewhat similar (67% vs. 77%), the post-plan-within-CHHA rate was roughly half of that for areas outside of the CHHA. These findings indicate that there may have been greater constraints imposed on residential development within CHHAs.

However, the parallel trend both within and outside of CHHAs may be evidence that the post-plan-approval decline within CHHAs was due to broader phenomena, such as the overall impacts of comprehensive plan implementation, independent of policies directed specifically at CHHAs, or other phenomena such as limited supplies of vacant land, reduced rates of population growth, or slower economic growth.

Findings from a Jurisdiction Level Review

Beyond an analysis of trends across the entire sample, we undertook a jurisdiction level analysis of land use changes within and outside of the CHHA. We found that the overall patterns were consistent with the hypothesis that implementation of comprehensive plan policies may have reduced growth rates within CHHAs relative to areas outside CHHAs. It was noteworthy, however, that a third (33 percent) of the 61 coastal communities with land both within and outside a CHHA had higher rates of growth in the numbers of residential units within their CHHAs than outside after comprehensive plan approval. Nevertheless, only 8 percent of the communities with land within a CHHA had higher rates of residential growth within the CHHA after comp plan approval than before.

Conclusions

Our findings present a somewhat mixed picture of the possible impacts of Florida's hazard mitigation planning mandate on development that has occurred within the areas most prone to hurricane flood damage, the CHHA. The general pattern that emerges from an examination of aggregate development trends for all communities in our sample, and a jurisdiction level review of development trends, was one of less residential development growth within CHHAs than in areas outside of CHHAs, both prior to and after comprehensive plan approval and implementation. We also found that post-plan-approval residential growth within CHHAs was slower relative to that in areas outside of CHHAs. This indicates that, all else being equal within these two zones, there may have been greater constraints imposed on residential development within CHHAs.

However, while development rates within CHHAs appear to have slowed, the total increases in residential exposure that have occurred since comprehensive plan approval are very substantial. Further, nearly half of the coastal communities in our sample permitted increases in numbers of residential units of 17 percent or more subsequent to the approval of their comprehensive plans.

Questions remain concerning why the observed increases in exposure occurred. It may be that local governments failed to adopt the mandated comprehensive plan policies, or they may have adopted the policies but failed to successfully implement them. Even where communities may have attempted to follow both the letter and the spirit of the law, at least three constraints may have limited their ability to do so: (1) the conversion of seasonal residences to permanent residences; (2) vesting provisions of the state growth management law; and (3) political and legal constraints to down-zoning. We intend to address these implementation questions in subsequent phases of this research initiative.

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