Flood Insurance and Coastal Development

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Flood insurance coverage is now widespread among coastal homeowners in the United States. Indeed, coverage is far higher among coastal residents than those within river floodplains (Kusler 1983, 7). Serious questions, however, have been raised concerning the efficacy of the flood insurance program in reducing flood losses along the shoreline (Miller 1977, 40-41; Kusler, 1982, 45-46; U.S. General Accounting Office, 1982; Burby and French, 1985, 103). For example, Miller noted that the availability of Federal Insurance Administration flood insurance increased the demand for coastal properties, increased property values, and did not diminish the siting of houses within high hazard areas. Nevertheless, Miller (1983, 157), drawing from case studies in over two dozen coastal communities, notes that in only one -- Galveston, Texas -- did the availability of flood insurance make a difference between development or no development. Kusler (1982, 45) indicates that most of the state and local officials he interviewed "were of the belief that the insurance had encouraged some development although how much was unclear." Burby and French (1985, 88) indicate "that participation in the National Flood Insurance Program is associated with continued development of flood-hazard areas, particularly in coastal communities." Partly in response to concerns such as these, Congress established the Coastal Barrier Resources System in 1982. Federal expenditures, including the writing of new federally-subsidized flood insurance policies were prohibited within the 186 designated coastal barriers,

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representing 656 miles of shoreline fronting the Atlantic Ocean or Gulf of Mexico.

A major expansion of Coastal Barriers Resources System was proposed in 1985 (U.S. Dept. of Interior 1985a, 1985b), which would add substantial areas, including portions of the Florida Keys, to the System. Four years later the issue of whether to include the Keys within an enlarged system remains unresolved. However, in its 1988 report to Congress, the U.S. Department of Interior’s (1988) Coastal Barriers Study Group recommended the inclusion of 19,831 land acres of the Florida Keys within the Coastal Barriers Resources System—with 13,059 of these acres being located within the Lower Florida Keys. It is within this area (Figure 1) that the efficacy of the flood insurance program in reducing potential losses and the effects of the program upon new residential development are examined a decade after the area entered the National Flood Insurance Program.

**The lower florida keys study area**

The Florida Keys are one of the most vulnerable areas of the United States to coastal flooding. The Florida Coastal Coordinating Council (1974, 9) indicates:

> Disaster preparedness experts feel that we are well on the way in the Keys to producing one of the greatest man made natural disasters in history.

With a maximum elevation of eight feet, a one-in-a-hundred year hurricane would inundate the entire land area of the Lower Florida Keys -- those islands from Big Pine through the Saddlebunch Keys, an area ten to thirty-two miles east of Key West, Florida.
Figure 1

The Florida Keys

STUDY AREA

Mile

Ellen Key
Tavernier
Plantation Key
Islamorada
Key Largo
Windley Key
Upper Matecumbe Key

Lower Matecumbe Key

FLORIDA BAY

Marathon
Grassy Key
Vaca Key
Saddlebunch Keys

Key West
Marquesas Keys

Cudjoe Key
Big Pine Key
Sugarloaf Key
Summerland Key
Geiger Key
Ratia Honda

STRAITS OF FLORIDA
Storm surges could come from either the Gulf of Mexico or the Atlantic Ocean (Federal Emergency Management Agency 1983, 19). Local base flood levels, as shown on Flood Insurance Rate Maps (FIRM) issued in 1983 by the Federal Emergency Management Agency, range from nine through twelve feet. Even the ten-year storm would flood most of the region (U.S. Army Corps of Engineers, 1972), which has experienced hurricanes in one of seven years on the average over the past century (Simpson and Lawrence, 1971). Nevertheless, this area has been unscathed by major hurricane damage since the 1960s, when it was hit in 1960, 1965, and 1966. It has been threatened by several storms in recent years, including Hurricane Kate, which moved within 90 miles of the area in November, 1985. However, these storms all spent their fury elsewhere. Although Hurricane Floyd tracked along U.S. Highway 1 through the Florida Keys in October 1987, the storm was of minimal strength and caused little damage.

Residential development within the Florida Keys has been considerable over the past several decades, not unlike many areas of the American shore (Baker, 1979). Between 1970 and 1980 the population of Monroe County, exclusive of Key West (where population changes also reflect variations in naval deployment), increased by 67%. Within the Lower Florida Keys, the almost all white population was 6,353 at the time of the 1980 Census, with 4,514 housing units enumerated. Throughout the Florida Keys (excluding the Key West urban area), 31.2% of the houses had been built in the five years preceding the 1980 Census. Until the mid-1970s, residential construction within Monroe County occurred without flood zone regulations. Land use planning began within the county in 1960 and the first zoning ordinance merely required that “no building intended for residential purpose shall be moved into or constructed on land subject to periodic or frequent flooding . . . ” (Monroe County,
In 1973, the restrictions were increased, prohibiting the platting of land below 3.5 feet in elevation for residential purposes, unless the land was elevated with fill to that level (Monroe County, 1973). These minimal restrictions were replaced by an ordinance introduced in late 1974 regulating new construction within Special Flood Hazard Districts (Monroe County, 1975). This ordinance, enacted as a requirement for the County to enter the National Flood Insurance Program, mandated that the lowest floor of all new buildings be elevated above the 100-year flood level -- eight feet on the flood maps then used in the Lower Florida Keys. Although additional land use controls exist within the area because of the designation of the Florida Keys as an “Area of Critical State Concern” under provisions of the Florida Environmental Land and Water Management Act of 1972, the purpose of this paper is to examine the effects of the National Flood Insurance Program upon the area’s residential development.

**Research methodology**

Data concerning the residential development and the residents’ adjustments to the hurricane hazard were obtained from surveys conducted among homeowners and area realtors, from property appraisal records within the Monroe County Property Appraiser’s Office, and from field reconnaissance. Field observations of the housing were conducted in 1976 and 1984. Property and dwelling appraisal data for 1974 and 1982 were collected for about 33% of the 1974 housing units, via a systematic random sample.

In Fall 1983, an eight-page questionnaire was mailed to all individuals shown by records in the Monroe County Property Appraiser’s Office to have acquired housing in the study area during the previous four years. Completed surveys were received
from 786 house or mobile home owners, representing a response rate of 66%. This may be considered a very good response for a mail survey to the public. The questionnaire was also sent to a smaller sample of homeowners who purchased their homes before the county adopted its flood elevation ordinance. All members of the Marathon and Lower Keys and the Key West Boards of Realtors were sent surveys. Completed questionnaires were returned by 149 realtors--a response rate of 54%. Although this response rate was relatively high, realtor responses may reflect biases caused by over representation of realtors working out of certain offices. In-depth personal interviews were held with 53 area realtors to elicit responses to open-ended questions and to permit detailed follow-ups where appropriate. A detailed analysis of the influences of the realtors upon home purchases within this coastal flood zone is reported in Cross (1985).

**Flood insurance coverage**

Nearly three-quarters of the homeowners had obtained flood insurance coverage within the Lower Florida Keys study area by 1983, nearly a decade after it became available in the area. Federal regulations, which require homeowners who have mortgages provided by federally chartered or insured financial institutions to carry flood insurance, have had a major role in the acquisition of this insurance. Nevertheless, these requirements have neither been completely successful in assuring that insurance is obtained nor were these mortgage regulations the only factor promoting flood insurance coverage. Cases were discerned where a local bank provided mortgages for uninsured homes and where residents had mortgaged other properties to avoid obtaining a mortgage requiring flood insurance for their second homes. Notwithstanding these examples, even those recent homebuyers
without mortgages are now usually covered, with 68.4% of the post-1979 house buyers whose homes were mortgage free having obtained flood insurance. The most prominent reason cited by residents who decided against obtaining flood insurance was that flood insurance was too expensive or unaffordable. Also, 8.9% of the uninsured house buyers and 43.3% of their counterparts who purchased mobile homes indicated that they could afford the loss. Thus, the availability of flood insurance has greatly lowered the vulnerability of residents to catastrophic financial loss should a hurricane inundate the area.

Flood insurance coverage is generally unrelated to the homeowners’ perceptions of the hurricane threat, even when controlling for whether the resident’s homes were mortgaged. Indeed, for unmortgaged homeowners, there were no significant relationships between flood insurance coverage and the homeowners’ perceptions of either hurricane waves and flooding or hurricane winds as problems in living in the area, the homeowners’ expectations of a damaging hurricane within the next ten years, their evaluations of the probability of hurricanes within the Florida Keys compared with other coastal areas, or the homeowners’ considerations of the relative vulnerability of the Keys to damage during a hurricane in comparison with other locations. On the other hand, the residents’ knowledge of their flood zone location was related to their flood insurance coverage. In general, other than statistical differences in insurance coverage of houses and mobile homes, variations in the vulnerability of house types (stilt versus ground level) and homesites within this highly vulnerable coastal location are unrelated to flood insurance coverage, although a slightly greater tendency for the most vulnerable homes to be insured was discerned. Thus, flood insurance requirements do not seem to heighten residents’ concerns about coastal flooding, although they may heighten awareness.
Sixty% of the recent home purchasers expect a damaging hurricane within a decade and over three-quarters feel that their homes would suffer at least moderate damage if a hurricane directly hit their location. Indeed, these findings are similar to those noted by McElyea and colleagues (1982, 6-12) based upon research in North Carolina, "This attitude [that hurricanes are of low risk] is further exacerbated by the availability of flood insurance. The certainty of enjoying the house insured from danger seems to outweigh the threat of potential damages."

Flood insurance and increased coastal development

The availability of flood insurance may have contributed to the increased occupation of the coastal flood zones within the Florida Keys. Evidence supporting this argument includes observations of local real estate agents, the responses of homeowners and recent home buyers, the appreciation in value of real estate since the county entered the National Flood Insurance Program, and the location of new residential construction.

The number of single-family residences within the study area has nearly doubled since Monroe County first adopted its flood elevation ordinance required for participation in the National Flood Insurance Program. Houses account for approximately two-thirds of the nearly four thousand residences within the study area, with mobile homes comprising nearly one-third of the residences. The increase in the number of mobile homes has been minimal with the halt in new mobile home park development.

New residential construction within the Lower Florida Keys has primarily occurred within the Velocity Zones as identified on the Federal Insurance Rate Maps (Table I). Velocity (or V) Zones
designate those areas that would not only experience flooding during the one-in-a-hundred-year storm, but would also experience damaging wave action because of their proximity to the coast. Areas which would experience flooding without wave action during the hundred-year storm are designated as A Zones. V Zones in the Lower Florida Keys could experience both flooding of ten to twelve feet and wave action during the regulatory 100-year storm. 63% of the houses built before the county adopted its flood zone ordinance, as required to enter the National Flood Insurance Program, were constructed in these Velocity Zones. Of the nearly 1300 houses constructed between the time that the flood zone ordinance took effect in early 1975 and field reconnaissance of the study area in mid-1984, 71.5% were constructed in these

<table>
<thead>
<tr>
<th>Island</th>
<th>Pre-Regulation</th>
<th>Post-Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V-Zone</td>
<td>A-Zone</td>
</tr>
<tr>
<td>Saddlebunch Keys</td>
<td>32 (71.1%)</td>
<td>13 (28.9%)</td>
</tr>
<tr>
<td>Sugarloaf Key</td>
<td>34 (18.6%)</td>
<td>149 (81.4%)</td>
</tr>
<tr>
<td>Cudjoe Key</td>
<td>68 (61.8%)</td>
<td>42 (38.2%)</td>
</tr>
<tr>
<td>Summerland Key</td>
<td>195 (89.0%)</td>
<td>24 (11.0%)</td>
</tr>
<tr>
<td>Ramrod Key</td>
<td>52 (64.2%)</td>
<td>29 (35.8%)</td>
</tr>
<tr>
<td>Little Torch Key</td>
<td>38 (39.6%)</td>
<td>58 (60.4%)</td>
</tr>
<tr>
<td>Big Pine Key</td>
<td>428 (70.6%)</td>
<td>178 (29.4%)</td>
</tr>
<tr>
<td>Total Lower Keys</td>
<td>1340 (63.2%)</td>
<td>493 (36.8%)</td>
</tr>
</tbody>
</table>
SUMMERLAND KEY
RESIDENTIAL CONSTRUCTION

□ House Built BEFORE Flood Ordinance Adopted
■ House Built AFTER Flood Ordinance Adopted

Figure 2
Velocity Zones. An examination of a map of residential construction on Summerland Key (Figure 2) shows the propensity of residents to construct their homes within Velocity Zones (covering most of the island), frequently along the open shore or beside finger-fill canals. The locations of new residential units vis-a-vis the shore and their homesite elevations do not significantly differ from the locations of the housing built before the county’s enactment of its flood zone ordinance. Almost all the new houses are being constructed in subdivisions that were already platted -- and in most cases occupied by scattered houses -- before the regulations took effect.

The flood zone elevation requirements, required by the flood ordinance as a condition for participating in the National Flood Insurance Program, have assured that over 90% of the new residential construction is built on elevated stilts, with the remaining new houses being built on fill (Table 2). However, the utility of this mitigation measure is often negated by the building of enclosed garages, recreation rooms, and even bedrooms within the space beneath the elevated houses. Indeed, 40% of the elevated houses built since the flood elevation requirements were established have at least half their lower levels enclosed. Also, 60.4% of the recent buyers of stilt houses indicated that the “possibility of enclosing [the] downstairs as a home addition” was a very important or important factor in their decision to purchase the stilt house. Likewise, 67% of the area realtors interviewed indicated that customers purchasing stilt houses usually mentioned the possibility of enclosing the downstairs as an addition. In fact, when asked to estimate how frequently their customers mentioned various factors, a greater proportion of the realtors indicated that the possibility of enclosure was usually mentioned than the better breezes, the view from the home, or flood protection that the stilt houses would provide. Although the county adopted a tough new
flood zone ordinance in late 1983, the enforcement of the previous ordinance was generally lax, particularly with respect to the use of breakaway walls and the granting of mobile home variances. Continued liberal granting of commercial and residential variances threatened to put Monroe County’s participation within the National Flood Insurance Program in jeopardy in late 1987. It is interesting that this problem is by no means confined to the Florida Keys. For example, “[t]he processing of [flood insurance] claims of Hurricane Alicia [in Texas] uncovered a significantly large
number of policies which were misrated due to enclosure below the elevated first floor” (Madsen 1985, 157).

Coastal flood zone real estate remains in high demand a decade after the county entered the National Flood Insurance Program. According to records in the Monroe County Property Appraiser’s Office, prepared to assess property taxes for the 1974 and 1983 tax rolls, shorefront homesites had the highest assessed values both times. Homesites along the open shore as a group have increased in value slightly less than lots on canals or in the interior. Nevertheless, homesites within the Velocity Zones displayed greater increases in appraised values than did homesites within A Zones, where flooding without velocity could be expected (Table 3). The associations between the increase in the homesite values and the flood zones were significant, even when controlling for the homesite elevation and whether the homesite was on the shore, along a canal, or away from the coast.

| Table 3 |
| Changes in the Appraised Values of Residential Homesites and the Homesites Federal Insurance Rate Map Flood Zone Location |
| **1982 Values as a % of their 1974 Values** | **V Zone (N=259)** | **A Zone (N=145)** |
| 250% or less | 30 (11.6%) | 20 (13.8%) |
| 251 to 350% | 86 (33.2%) | 67 (46.2%) |
| 351 to 450% | 88 (34.0%) | 32 (22.1%) |
| More than 450% | 5 (21.2%) | 26 (17.9%) |

\[ \chi^2 = 9.461, \text{ with 3 degrees of freedom, } \alpha = .024 \]

(Percentages add to 100.0% across the columns.)
Stilt houses, built before they were virtually required by the flood elevation ordinance, generally appreciated more in value than the ground level houses (considering the dwelling appraisal separate from the land appraisal) (Table 4). Although the increase in appraised value of stilt houses (dwelling only) was unrelated to the homesite's flood zone, pre-flood regulation ground level houses within the FIRM Velocity Zones appreciated less in value as a whole than did those within the A-Zones (Table 5).

Table 4

<table>
<thead>
<tr>
<th>Changes in the Appraised Values of Stilt and Ground Level Houses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982 Values as a % their 1974 Values</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>150% or less</td>
</tr>
<tr>
<td>151 to 200%</td>
</tr>
<tr>
<td>201 to 250%</td>
</tr>
<tr>
<td>More than 250%</td>
</tr>
</tbody>
</table>

χ² = 46.633, with 3 degrees of freedom, α = .000 (Percentages add to 100.0% across the columns.)

Early 150 members of the Key West and Marathon and Lower Keys Boards of Realtors responded to a mail survey, which included the question, "Do you think that the availability of flood insurance makes it easier to sell homes and property within the Florida Keys?" (Table 6). Overall, 61% of the realtors responded
Table 5
Changes in Assessed Values of Ground Level Houses (1974 to 1982) and the Homesites Federal
Insurance Rate Map Flood Zone Location

<table>
<thead>
<tr>
<th>1982 Values as a % of their 1974 Values</th>
<th>House in FIRM V Zone (N=153)</th>
<th>House in Firm A Zone (N=111)</th>
</tr>
</thead>
<tbody>
<tr>
<td>150% or less</td>
<td>28 (18.3%)</td>
<td>10 (9.0%)</td>
</tr>
<tr>
<td>151 to 200%</td>
<td>90 (58.8%)</td>
<td>59 (53.2%)</td>
</tr>
<tr>
<td>201 to 250%</td>
<td>21 (13.7%)</td>
<td>25 (22.5%)</td>
</tr>
<tr>
<td>More than 250%</td>
<td>14 (9.2%)</td>
<td>17 (15.3%)</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 9.164, \text{ with 3 degrees of freedom, } \alpha = 0.027 \]
(Percentages add to 100.0% across the columns.)

yes, 14% were uncertain, with only 25% of the realtors disagreeing. Although interviews with the realtors indicated that they were split on the question "Have you found that the availability of flood insurance makes your customers more likely to locate near the water or on low-lying property?", with 40% responding affirmatively and 60% indicating not, they viewed flood insurance as positively influencing the sale of homes.

Homeowners also generally view flood insurance as having a positive influence upon the salability of their homes. Indeed, in response to the question, "Do you think that the availability of flood insurance will make your home easier to sell if you decided to move?", nearly two-thirds of the post-1979 homebuyers responded affirmatively. The responses of both buyers of houses
Table 6
Flood Insurance as an Asset in Selling Real Estate: Opinions of Realtors in the Florida Keys

<table>
<thead>
<tr>
<th>Area of Keys where realtor sold homes:</th>
<th>Yes</th>
<th>No</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key West (N = 49)</td>
<td>53.1%</td>
<td>26.5%</td>
<td>20.4%</td>
</tr>
<tr>
<td>Saddlebunch, Sugarloaf, and Summerland Key Area (N = 28)</td>
<td>35.7%</td>
<td>46.4%</td>
<td>17.9%</td>
</tr>
<tr>
<td>Ramrod, Little Torch, and Big Pine Key Area (N = 26)</td>
<td>53.8%</td>
<td>42.3%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Marathon, Key Colony Beach, and Duck Key Area (N = 54)</td>
<td>68.5%</td>
<td>22.2%</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

and mobile homes were virtually identical, with recent homebuyers expressing a slightly more positive response than the pre-regulation homeowners (those purchasing houses before 1975). With flood insurance viewed as an asset, most of the homebuyers felt that their flood zone location would not affect their ability to sell their homes nor its selling price.

Recent home buyers who expressed the greatest concern about the hurricane hazard were those who were most likely to believe that the availability of flood insurance would make their homes easier to sell (Table 7). Not only were the residents' expectations of a damaging hurricane in the next decade and their hazard perceptions significantly related to their flood insurance attitudes, but residents
Table 7
Post-1979 House Buyers’ Evaluation of Hurricane Flood Hazard and Their Beliefs that Flood Insurance is an Asset in Home Sales

<table>
<thead>
<tr>
<th>Hurricane Waves and Flooding Considered:</th>
<th>“Do you think that the availability of flood insurance will make your home easier to sell if you decided to move?”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Major Problem (N = 99)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>(72.7%)</td>
</tr>
<tr>
<td>Somewhat a Problem (N = 173)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>(65.9%)</td>
</tr>
<tr>
<td>Minor Problem (N = 100)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>(59.0%)</td>
</tr>
<tr>
<td>Not a Problem at All (N = 41)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(46.3%)</td>
</tr>
</tbody>
</table>

\( \chi^2 = 18.488 \), with 6 degrees of freedom, \( \alpha = .005 \) (Percentages add to 100.0% across the columns.)

who were more knowledgeable about their flood zone location were significantly more likely to view flood insurance as an asset in selling their property (Table 8). Likewise, recent home buyers who purchased flood insurance were significantly more likely to believe that the availability of this insurance would make it easier to sell their homes in the future (Table 9). Thus, for the residents who are most concerned about the hurricane flood hazard, the availability of flood insurance alleviates this concern, and indeed, may actually contribute to the popularity of the most vulnerable shorefront properties.
Post-1979 House Buyers’ Belief that Flood Insurance is an Asset in Home Sales and Knowledge of their Homes’ Flood Zone Location

<table>
<thead>
<tr>
<th>Flood Zone Knowledge</th>
<th>Yes</th>
<th>No</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware Home in Flood Zone (N=216)</td>
<td>150 (69.4%)</td>
<td>36 (16.7%)</td>
<td>30 (13.9%)</td>
</tr>
<tr>
<td>Unaware or Uncertain Home in Flood Zone (N=160)</td>
<td>92 (57.5%)</td>
<td>30 (18.8%)</td>
<td>38 (23.8%)</td>
</tr>
</tbody>
</table>

χ² = 7.207, with 2 degrees of freedom, α = .027
(Percentages add to 100.0% across the columns.)

The vulnerability of the respondents’ homes was not clearly associated with their attitudes about flood insurance as an asset in selling. For example, differences between ground level house owners and stilt house owners in their belief that flood insurance availability was an asset when selling their homes were only significant at the 0.10 level (Table 10). Among owners of houses, no significant relationship existed between their FIRM flood zone and the insurance attitudes, although 66.3% of the V Zone inhabitants viewed it as an asset compared with 58.7% of the A Zone residents. Proximity to the shore or canals and the homesite elevation were only weakly related to the insurance as an asset.
Table 9
Flood Insurance Coverage Among Post-1979 House Buyers and their Belief that Flood Insurance is an Asset in Home Sales

<table>
<thead>
<tr>
<th>Flood Insurance Coverage</th>
<th>Yes</th>
<th>No</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Insured (N=313)</td>
<td>221 (70.6%)</td>
<td>46 (14.7%)</td>
<td>46 (14.7%)</td>
</tr>
<tr>
<td>Home Not Insured (N=105)</td>
<td>43 (41.0%)</td>
<td>32 (30.5%)</td>
<td>30 (28.6%)</td>
</tr>
</tbody>
</table>

χ² = 29.764, with 2 degrees of freedom, α = .000
(Percentages add to 100.0% across the columns.)

attitudes. Nevertheless, 74.3% of the post-1979 home buyers whose homesites are by the shore felt that flood insurance availability would aid future home sales, while only 55.1% of the owners of inland homesites made such claims.

Conclusion

Flood insurance coverage has increased significantly within the Lower Florida Keys over the past decade. Although the mortgage requirement has not been completely effective, it has promoted a high degree of coverage, which is high even among home owners lacking mortgages. Nevertheless, the availability of flood
Table 10
Post-1979 Buyers of Stilt and Ground Level Houses and their Belief that Flood Insurance is an Asset in Home Sales

<table>
<thead>
<tr>
<th>House Type Purchased</th>
<th>Yes</th>
<th>No</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stilt House (N=266)</td>
<td>163</td>
<td>54</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>(61.3%)</td>
<td>(20.3%)</td>
<td>(18.4%)</td>
</tr>
<tr>
<td>Ground Level House</td>
<td>78</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>(N=110)</td>
<td>(70.9%)</td>
<td>(10.9%)</td>
<td>(11.2%)</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 5.039, \text{ with 2 degrees of freedom, } \alpha = .081 \]
(Percentages add to 100.0% across the columns.)

insurance may have contributed to the greater desirability of coastal flood zone homes and has been ineffective in slowing coastal development, particularly within the most vulnerable velocity zones. In fact, it is possible, but difficult to prove, that the availability of flood insurance, which protects both homeowner and mortgage lender against financial loss, has stimulated growth, although considerable housing development had occurred in the area even before flood insurance was available.

If Congress expands the Coastal Barrier Resources System, further study of the impact of the National Flood Insurance Program on coastal development should be undertaken. Will properties within the already partly developed neighborhoods, which would be excluded from the System, become subject to more intense development pressure? What will happen within those sparsely
developed areas in which flood insurance would become unavailable? Although Godschalk (1984) conducted a pilot study exploring some of these questions within Hutchinson Island along Florida’s Atlantic Coast, planners as well as geographers should find the impacts of this federal legislation upon coastal development a topic worthy of continuing research.

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Monroe County, Florida (1975) An Ordinance Regulating Development Within Flood Hazard Districts Within the County of Monroe, Florida. Ordinance No. 3-1975. Monroe Board of County Commissioners. Key West.


