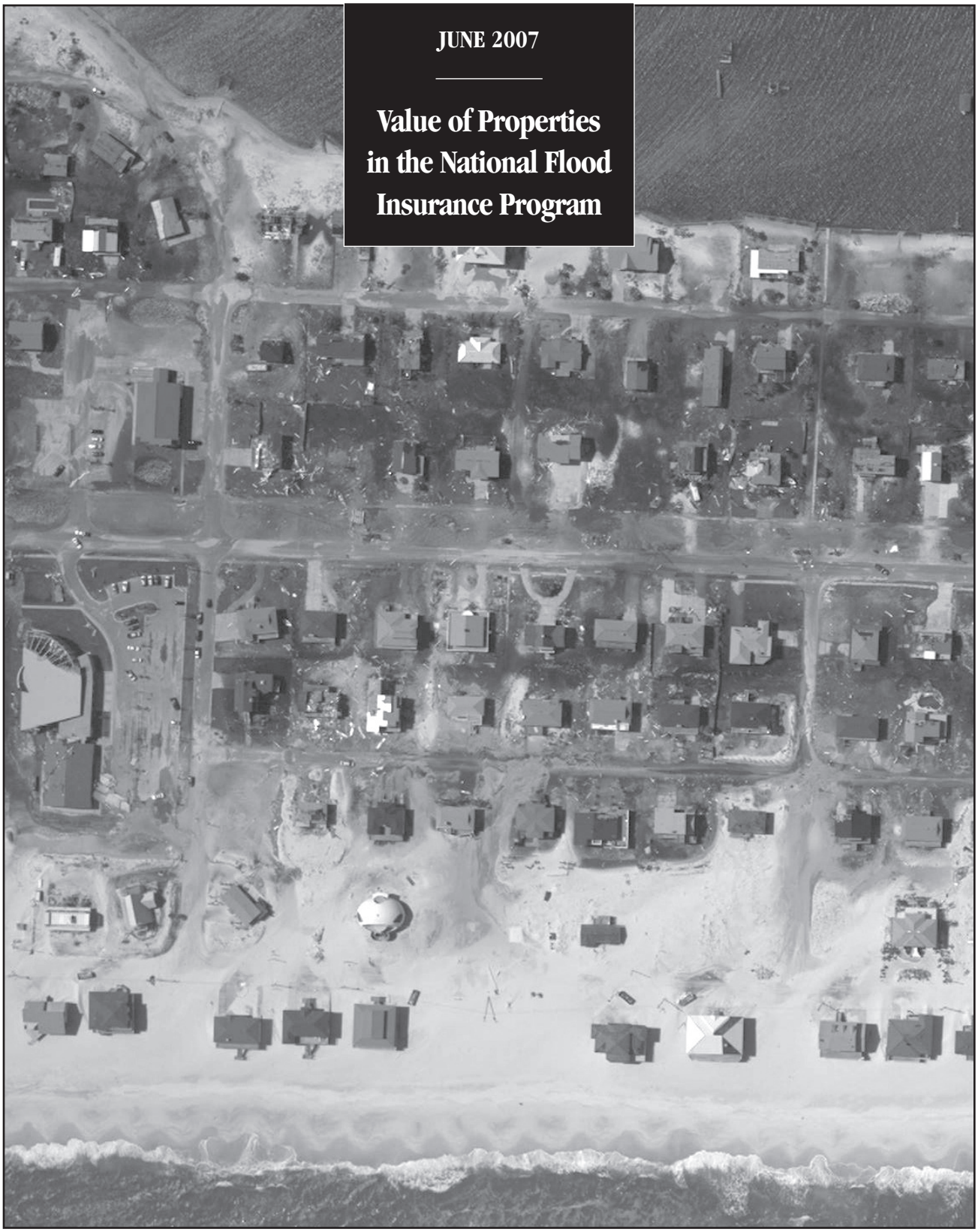
CONGRESS OF THE UNITED STATES
CONGRESSIONAL BUDGET OFFICE

A
CBO
PAPER

JUNE 2007

Value of Properties in the National Flood Insurance Program



Pub. No. 2925

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June 2007

The Congress of the United States ■ Congressional Budget Office

Notes

All years referred to in this paper are calendar years.

Numbers in the text and the tables may not add up to totals because of rounding.

The cover illustration is an aerial photograph of Pensacola Beach, Florida, July 11, 2005, the day after Hurricane Dennis struck (Remote Sensing Division, National Oceanic and Atmospheric Administration).

Preface

The effects of Hurricanes Katrina and Rita have prompted increased interest in policy questions about the National Flood Insurance Program. Some of those questions focus on the program's financial soundness and on the subsidized rates charged on certain policies. This Congressional Budget Office (CBO) paper was written at the request of the Ranking Minority Member of the Senate Budget Committee to address questions about the values of properties covered by flood insurance at subsidized rates. In keeping with CBO's mandate to provide objective analysis, the paper makes no recommendations.

Perry Beider wrote the paper, under the guidance of Joseph Kile and David Moore. The author thanks Thomas Hayes and Dan Spafford of the Federal Emergency Management Agency and Parker Boone of Computer Sciences Corporation for providing data on flood insurance policies. He also thanks James Q. Adams, Reggie Toledo, and their colleagues at Marshall & Swift/Boeckh for their work in matching the policy addresses to data on property values. Robert Dennis, Douglas Hamilton, Arlene Holen, Daniel Hoople, Donald Marron, David Torregrosa, and G. Thomas Woodward of CBO provided helpful comments.

Kate Kelly edited the manuscript, with assistance from John Skeen, and Leah Mazade proofread it. Maureen Costantino designed the cover and prepared the report for publication, with assistance from Allan Keaton. Lenny Skutnik produced the printed copies, Linda Schimmel coordinated the print distribution, and Simone Thomas prepared the electronic version for CBO's Web site (www.cbo.gov).

Peter R. Orszag
Director

June 2007

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Value of Properties in the National Flood Insurance Program

Summary and Introduction

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), is the primary source of insurance against flood damage in the United States. Property owners may purchase coverage in amounts up to $350,000 for single-family residential properties ($250,000 for the structure and $100,000 for its contents) and up to $1 million for nonresidential properties ($500,000 each for structure and contents).[1] As of February 2007, the 5.4 million policies in force had a total coverage of $1.0 trillion.[2]

The devastation caused by Hurricanes Katrina and Rita in 2005, which harmed both low- and high-income communities, drew attention to an important aspect of the NFIP: By design, the program is not actuarially sound—that is, its premiums and fees are insufficient to cover the average claims and expenses expected over the long run. An actuarially sound program would collect premium payments that would be expected to allow it to cover costs even in a catastrophic year, through some combination of reserves and borrowing to be repaid afterward. Although the NFIP operated as a largely self-financed program for many years, occasionally borrowing relatively small amounts from the Treasury and repaying them, it does not generate regular surpluses of the size needed to cover catastrophic losses.

The program's current debt—$17.5 billion as of May 2007, with an authorized debt limit of $20.8 billion—could be reduced if there were several years with below-average flood losses. But over the long run, the NFIP debt can be expected to grow by about $900 million per year, given current subsidy rates and the current mix of flood insurance policies.[3]

The program's actuarial imbalance arises, at least in part, from a statutory requirement that some NFIP policyholders—primarily those whose properties were built before their communities joined the program—receive coverage at rates that are explicitly subsidized.[4] Lawmakers built those subsidies into the program partly to ease the financial burden on property owners—some of whom had not previously realized the extent of their flood risk and whose actuarial (full-risk) premiums could be unattractively high—and partly as an incentive to communities to participate in the program and thus

1. Some flood insurance policies are contents-only policies purchased by renters. Where the distinction is not important, this report uses "property owners" to refer to both types of policyholder.

2. Those figures were collected from http://bsa.nfipstat.com/reports/1011_200702.htm, a table of NFIP policy statistics maintained by a FEMA contractor.

3. The Congressional Budget Office and others have used FEMA's estimates of the average percentage discount on subsidized policies to calculate the program's annual actuarial imbalance of $1.3 billion (see, for example, statement of Donald B. Marron, Acting Director, CBO, before the Senate Committee on Banking, Housing, and Urban Affairs, *The Budgetary Treatment of Subsidies in the National Flood Insurance Program,* January 25, 2006). Of that $1.3 billion, about $900 million is in forgone receipts that otherwise would be available to pay claims. The balance represents forgone allowances for sales expenses that otherwise would go to reimbursing the private insurance companies that sell the policies on behalf of the NFIP.

4. Coverage is available only for properties in communities that have either joined or applied to join the NFIP. More than 20,000 communities, whose residents account for 98 percent of the U.S. population, have joined the program (personal communication, Dan Spafford, FEMA, June 19, 2007). To be accepted, a community must adopt building codes and floodplain management practices that meet or exceed FEMA's standards.

to mitigate losses by adopting the NFIP's requirements for building standards and floodplain management.

The 2005 hurricane season brought increased attention to the program's subsidies. Policymakers have expressed concerns about the size of the program's actuarial imbalance, and they have questioned whether it is still appropriate for taxpayers to subsidize flood coverage, particularly for high-income policyholders who own property in high-risk areas (for example, along coastlines). Legislative proposals have been made to eliminate the subsidy for coverage on some types of properties, such as second homes and vacation properties.

This report by the Congressional Budget Office (CBO) addresses factual questions about the values of properties insured at subsidized rates (hereafter called subsidized properties) under the NFIP. Specifically, it compares the values of the properties covered by subsidized and unsubsidized insurance policies, and it examines in particular the subset of properties that are not primary residences—vacation properties, second homes, or rental properties.

The analysis uses data on the values of more than 10,000 NFIP-insured properties, sorted into four groups as subsidized or unsubsidized properties in coastal or inland areas. For this report, CBO considers a property to be in a "coastal" area if it is within a five-digit zip code that has any properties that are subject to storm wave action—that is, any properties in a "Zone V" area identified on a FEMA flood insurance rate map (FIRM). For this analysis, zip codes with no Zone V areas are considered "inland."

Because the 10,000 properties CBO analyzed are not a statistical random sample, the numerical results cannot be extrapolated nationwide. Nonetheless, several qualitative conclusions are drawn from the analysis:

- The properties covered under the NFIP tend to be more valuable than other properties nationwide. The median value of owner-occupied housing in the United States is about $160,000; across the four classes of property in the sample, median values for single-family principal residences range from about $220,000 to $400,000. Much of the difference is attributable to the higher property values in areas that are close to water.

- Many subsidized properties, especially those in coastal areas, have high values. For example, 40 percent of subsidized coastal properties in the sample are worth more than $500,000; 12 percent are worth more than $1 million. For inland properties, the analogous figures are 12 percent and 3 percent.

- The difference in the value of subsidized and unsubsidized properties in coastal areas is attributable more to the value of the land than to the value of the structures that occupy it. Subsidized structures are less valuable, on average, than unsubsidized structures in coastal areas. Those patterns of land and structure value occur because subsidies go to older structures, which, although perhaps less valuable in themselves, often occupy more desirable, first-developed locations. By contrast, inland subsidized properties tend to be less valuable than inland unsubsidized properties.

- A significant fraction of subsidized coastal properties (23 percent in the sample) consists of residential properties that are not the policyholders' principal residences. That category includes second homes and vacation properties, but it also includes properties that are rented to year-round tenants. Property values for subsidized coastal nonprincipal residences generally are higher than are those for subsidized coastal principal residences.

The scope of this study did not include analyzing the distribution of financial benefits that result from the subsidy. Some or all of the value of the subsidy available on coverage for a given property is likely to be capitalized into the property's value. Thus, when a subsidized property is sold, the buyer essentially pays for some or all of the subsidy's value up front, through a higher purchase price, thus reducing or eliminating the net gain. Exploring the distribution of the benefits of NFIP subsidies would involve analyzing both the extent to which the subsidies are capitalized and the turnover of the subsidized properties.

NFIP Policies and Pricing

The flood insurance program offers separate policies to insure building structures and contents. Coverage can be purchased to cover up to $250,000 for a residential building, up to $100,000 for residential contents, and up to $500,000 each for a nonresidential structure and its contents. Eighty-five percent of the nation's flood insurance

contracts are written for single-family homes, nearly 10 percent cover multifamily residences, and about 6 percent are for nonresidential properties (see Box 1).

Most flood insurance policyholders pay premiums that FEMA considers actuarially sound on the basis of the agency's FIRMs and its estimates of the frequency of storms of different sizes.[5] Roughly one-quarter of the NFIP policies, however, are sold at rates that are explicitly subsidized. Most of the subsidized policies cover structures (or the contents of structures) that were built before 1975 or before the creation of a community's FIRM, whichever is later.[6] Consequently, properties covered at subsidized rates generally are older than those whose owners pay the NFIP's full-risk premiums. Pre-FIRM properties remain eligible for subsidized coverage when they are sold; they become ineligible only when they sustain "substantial damage" in a flood (with a loss of 50 percent of the structure's market value) or when they undergo "substantial improvement" (with an increase of 50 percent in the structure's market value).

The subsidies apply only to a first tier of coverage: $35,000 for a residential building of one to four dwellings, $100,000 for nonresidential and larger residential buildings, $10,000 for the contents of a residential building, and $100,000 for the contents of a nonresidential building. Most policyholders purchase coverage exceeding those amounts. According to FEMA, in 2004 the average limit on all flood insurance policies (including unsubsidized policies and those covering contents only) was $155,816. Policyholders who purchase coverage above the subsidized tier save money overall but do not face incentives at the margin to purchase excessive coverage or to neglect opportunities to reduce their exposure to flood risk.

In percentage terms, overall discounts on the subsidized policies tend to be large, taking into account coverage purchased above the first tiers. Because most claims for flood damage are relatively small—the average claim on a subsidized policy in 2004 was about $31,000, and the median claim was below that—the rates for the first tier of coverage have a much greater effect on the actuarial soundness of the overall premium than do the rates above the first tier.[7] FEMA estimates that, on the whole, property owners with subsidized policies pay 35 percent to 40 percent of their full-risk premiums. The average subsidized annual premium that FEMA estimated for May 2006 at $721 would therefore cost $1,800 to $2,060 as a full-risk premium. For properties in areas where the probability of flooding is particularly high, full-risk premiums could cost more than three times the average.[8]

5. Whether those "actuarial" rates are truly sufficient to cover average long-run costs depends on the accuracy of FEMA's maps and of its forecasts of the frequency and severity of storms. CBO is exploring whether there is evidence of inaccuracies (maps that do not show recent land development projects or that insufficiently consider possible increases in storm frequency) that would suggest a downward bias in FEMA's actuarial rates.

6. Also eligible are properties in communities for which FIRMs are not yet completed and properties built between 1975 and 1981 in areas that are subject to coastal flooding. (In 1981, FEMA incorporated new information about wave height and revised its new-construction standards for such areas.) Properties that will have flood protection when a half-finished structural project (such as a levee) is completed are eligible, as are properties in areas that were protected by structures that FEMA now deems insufficient provided that the schedule and plan for making repairs or upgrades meet specific standards. Together, those four types of properties account for about 8 percent of subsidized policies in the program. In addition, properties whose rates would otherwise be subject to increase when a FIRM is revised are "grandfathered in" to the previous rate category.

7. The NFIP's periodic *Actuarial Rate Reviews* (www.fema.gov/business/nfip/actuarial_rate.shtm) include cumulative numbers and sizes of claims paid; CBO calculated the average 2004 loss payment by comparing the figures through 2003 with those through 2004 in consecutive editions. The reports do not provide data on the median loss payment; however, the median is below the average because the average is more strongly influenced by the (comparatively few) payments for severe damage. Newer unsubsidized properties experience fewer events of minor flooding because they are subject to tighter building codes and land management policies; thus, the average 2004 loss payment on those properties was larger—about $40,300.

8. PriceWaterhouse Coopers, *Study of the Economic Effects of Charging Actuarially Based Premium Rates for Pre-FIRM Structures* (prepared for the Federal Emergency Management Agency, May 1999), p. 5-5, available from www.fema.gov/library/viewRecord.do?id=2555.

Box 1.

Data for This Report

The Congressional Budget Office (CBO) used a two-step process to obtain data on the 10,159 properties that are the primary subject of its analysis.

First, the Federal Emergency Management Agency (FEMA) drew random samples of 5,000 insurance contracts in each of four property categories: subsidized and unsubsidized coastal and inland properties. (In general, each contract represents one policy; however, more than one policy may be associated with a single contract for a condominium. For this analysis, FEMA drew random samples of addresses from its full set of contracts.) For this study, "coastal" areas extend beyond the Zone V areas shown on the FEMA flood insurance rate maps; each coastal area includes all properties in any zip code that contains even one insured Zone V property. CBO requested that classification of the data because the zones themselves, which represent only about 2 percent of the properties in the National Flood Insurance Program, seemed too small to reflect the interest in "coastal properties."[1] About 40 percent of flood insurance policies are written for properties in coastal areas.[2]

For each of the 20,000 properties initially included in the sample, FEMA provided the policy number, address, and occupancy type (single-family residence, two-to-four-family residence, larger residential, or nonresidential). FEMA also identified each residential property as the policyholder's principal or nonprincipal residence.

In the second step, CBO submitted the 20,000 addresses to Marshall & Swift/Boeckh (MSB), a company that supplies information on property values. MSB gathers data on assessed values from local tax assessors' offices, and it uses a proprietary model to arrive at its own property value estimates. MSB's database covers roughly 85 percent of the nation's metropolitan statistical areas (MSAs), which contain about 90 percent of the nation's population. The database does not include rural, non-MSA areas.[3]

1. Coastal areas could be defined more narrowly by using census tracts instead of zip codes, but FEMA does not collect census tract data on the properties covered by flood insurance. The definition used here excludes coastal areas that have no Zone V areas—that is, no properties subject to storm wave action—but such areas are unlikely to be important in the flood insurance program.
2. That includes 10 percent that are subsidized and 29 percent that are not. Similarly, the roughly 60 percent of inland properties nationwide consist of 15 percent that are subsidized and 45 percent that are not. In both types of areas, therefore, about one-quarter of the policies are subsidized.
3. Personal communication, James Q. Adams, Marshall & Swift/Boeckh, May 21, 2007.

Findings

Examination of the data for the 10,000 NFIP properties shows that a significant fraction of subsidized policies are written for high-value properties. That fact is attributable more to the prevalence of such properties in the program than to a disproportionate allocation of subsidies to high-value properties. Even so, for some categories, subsidized properties are worth more than unsubsidized properties. The tendency toward above-average values in the NFIP is particularly evident for some subgroups of properties, notably nonprincipal residences and nonresidential properties.

Insured Properties Versus Properties Nationwide

The average property value in the NFIP sample—for all types of property, including multifamily dwellings and commercial properties—ranged from $325,000 for subsidized inland properties to $570,000 for subsidized coastal properties; unsubsidized properties fell in between

Box 1.

Continued

Distribution of Contracts, by Structure Type

(Percent)

	Nationwide[a]	Sampled in This Study
Single-Family Residential	85.0	93.2
Principal residence	70.7	77.6
Nonprincipal residence	13.9	15.5
Unknown	0.3	0
Multifamily Residential	9.4	5.4
Principal residence	3.8	2.7
Nonprincipal residence	5.6	2.7
Nonresidential	5.6	1.4

Source: Congressional Budget Office.

Note: Because several policies can be associated with a contract for a condominium, multifamily residential properties represent 9.4 percent of contracts but 26.5 percent of policies.

a. As of December 31, 2005.

Matches for 11,847 of the 20,000 addresses (59 percent) were found in MSB's database; some properties that could not be matched are outside the database's coverage area, but most of the unmatched addresses probably represent coding problems. (According to MSB staff, coding problems alone—missing subaddresses, revised zip codes, bad street names, informal neighborhood names instead of official jurisdiction names, and others—can lead to matching-failure rates of 50 percent.)

Property values were available from one source or another for almost all of the matched properties. Estimated values were available for 10,159 properties; a larger number (11,507) of assessed values was available, but the estimated values reflect wider information and appear to be less subject to coding errors and other problems of data quality. (For example, 961 of the 11,507 nonzero assessed values were below $10,000; none of the estimated values was below $26,000.) Accordingly, the analyses below reflect the estimated values, with the exception of the analysis of the disaggregated values for land and improvements, for which estimated values were not available.

The 10,159 properties for which CBO has estimated values consist of 2,506 subsidized and 2,453 unsubsidized coastal properties and 2,092 subsidized and 3,108 unsubsidized inland policies. Relative to the set of all properties with NFIP coverage, the sample overweights subsidized properties (46 percent in the sample versus 26 percent nationwide) and coastal properties (48 percent versus 40 percent). Although the original samples of 5,000 addresses were drawn randomly, the properties analyzed here are not random statistical samples from each of the four groups. For example, the data do not cover insured properties in communities outside the metropolitan areas in MSB's database (those communities represent about 10 percent of the U.S. population).

In addition, address match rates and the availability of estimated values were lower for multifamily and nonresidential properties than for single-family residences—for example, because MSB's data do not include separate addresses for individual apartments (some of which may have contents insurance). As shown in the table, the result overrepresents single-family homes somewhat and underrepresents the other two categories. CBO believes, however, that most of the unmatched properties do not differ in relevant ways from the matched properties and that the limitations on the sample do not affect the results of the analysis in a qualitative way.

Table 1.

Median and Average Property Values of Sampled NFIP Properties

	Number of Properties in Sample Data	Average Property Value	Median Property Value	Single-Family Principal Residences	
				Number	Median Value
Subsidized Coastal	2,506	$570,238	$429,118	1,677	$402,768
Unsubsidized Coastal	2,453	$515,262	$368,422	1,843	$339,842
Subsidized Inland	2,092	$325,017	$231,316	1,685	$223,692
Unsubsidized Inland	3,108	$368,023	$304,252	2,690	$306,107
Memorandum:					
Bureau of the Census Estimates for Median Value of All U.S. Owner-Occupied Housing					
2005 American Housing Survey					$165,344
2004 American Community Survey					$151,366

Source: Congressional Budget Office.

Note: NFIP = National Flood Insurance Program.

(see Table 1).[9] In all cases, the number of properties with very high values helps raise the averages; the median values are distinctly lower. As with the averages, the lowest and highest median values are for the subsidized inland and coastal properties, respectively.

Although a direct comparison with the universe of all properties nationwide is not possible, the best available data indicate that properties that carry flood insurance tend to be more valuable as a group. According to the Census Bureau's American Community Survey, the median value of owner-occupied housing in the United States in 2004 was $151,366; its American Housing Survey reported a 2005 median value of $165,344.[10] NFIP data do not show whether residential properties are occupied by their owners; the best available comparisons with the Census Bureau's figures are the median values (estimated as of 2006) for single-family principal residences, which range from $224,000 for subsidized inland properties (roughly 40 percent above the national figure) to $403,000 for subsidized coastal properties.

Properties with Insurance: Coastal Versus Inland

Coastal properties have much higher average and median values than inland properties do, primarily because coastal land is more expensive. For subsidized properties, the average and median values are 75 percent and 86 percent higher, respectively; for unsubsidized properties, the values are 40 percent and 21 percent higher (see Table 1). Subsidized properties are more valuable than unsubsidized properties in coastal areas but less valuable inland.

The contribution of land value to the disparity between coastal and inland property values is shown in Table 2, which presents data from a smaller sample of properties for which assessed land and improvement values are available separately. (The assessed values are not directly comparable with those used elsewhere in this report, which come from a valuation model developed by Marshall & Swift/Boeckh [MSB].)[11] The difference

9. Commercial properties tend to be more valuable than residential properties, but because they represent only about 2 percent of the sample, excluding them would not significantly change the average or median values in Table 1.

10. The former figure is at www.census.gov/compendia/statab/tables/07s0960.xls; the latter at www.census.gov/hhes/www/housing/ahs/ahs05/tab314.html. For a discussion of the differences between the two surveys, see Bureau of the Census, "Fact Sheet: Differences Between the Housing Cost and Housing Quality Estimates from the American Community Survey and the American Housing Survey" (November 2004), www.census.gov/hhes/www/housing/hsgcostfactsheet.html.

11. For the same properties, assessed values tend to be significantly lower—by about 50 percent, on average, for each of the four types of property. The differences arise from assessments that are outdated (sometimes by years or even decades, if localities reassess only when ownership changes); assessment growth rate caps; and exemptions for some classes of property owners, such as veterans or other groups. CBO considers the values produced by MSB's model to be better indicators of current market values (see Box 1 on page 4); however, the model does not provide separate values for land and improvements.

Table 2.

Average Land and Improvement Values of NFIP Properties

	Number of Properties with Data Available	Average Improvement Value	Average Land Value	Average Total Value
Subsidized Coastal	1,173	$130,383	$270,308	$400,691
Subsidized Inland	1,727	$93,105	$75,406	$168,511
Difference in value		**$37,278**	**$194,902**	**$232,180**
Unsubsidized Coastal	753	$147,714	$194,133	$341,847
Unsubsidized Inland	1,008	$177,611	$143,005	$320,616
Difference in value		**-$29,897**	**$51,128**	**$21,231**

Source: Congressional Budget Office.

Notes: The component and total property values reported in this table are based on tax assessment data, which generally provide lower figures than those from the Marshall & Swift/Boeckh proprietary model, used elsewhere in this report.

NFIP = National Flood Insurance Program.

in average land values is more than 80 percent of the difference in average total values for subsidized coastal and subsidized inland properties. Land values account for more than 100 percent of the difference for corresponding unsubsidized properties, more than compensating for the fact that average improvement value is lower along the coasts than inland. However, that relationship between average improvement values of unsubsidized properties in the two areas could be an artifact of the limited samples of properties for which separate land and improvement data are available. In particular, the unsubsidized inland properties appear to be relatively more valuable in this set of properties than in the larger sets of all properties with assessed or estimated values.[12]

Subsidized Versus Unsubsidized Properties

Table 2 also shows that average improvement values for coastal and inland subsidized properties are below those of corresponding unsubsidized properties. Because the subsidies go primarily to properties that were built before a community FIRM was drawn, the subsidized and unsubsidized categories can be roughly associated with older and newer properties, respectively. Thus, the relative values in Table 2 can be interpreted as showing that older structures tend to be less valuable—perhaps because they are smaller or lack modern amenities, or perhaps simply because they have aged. The difference between subsidized and unsubsidized inland properties could be at least partly an artifact of the samples for which separate data on land and structure values are available. At a minimum, though, the evidence here does not suggest that the subsidies tend to cover larger or more luxurious structures, whether inland or in a coastal area.

Land values reveal different inland and coastal patterns: Newer, unsubsidized properties have higher land values in inland areas, whereas older subsidized properties occupy more valuable land in coastal areas. One likely reason for the pattern observed in coastal areas is that the more desirable locations often are developed first. Another factor is that the subsidies themselves help raise property

12. Property value data disaggregated into assessments of land and improvement values are available only for 40 percent of the properties with nonzero assessed values. The average assessed value for unsubsidized inland properties with disaggregated data is one-third higher than for properties without such data. In contrast, averages for the other three categories for properties with disaggregated data are 2 percent to 27 percent lower than for those without. (The reason for this variation in relative values is not known.) If the pattern of average total values in the last column of Table 2 (where the inland-to-coastal ratio of average values of unsubsidized properties is .94) were more like the pattern for the larger sets of all sampled properties with estimated values, as shown in Table 1 (where that ratio is .71), the finding that average improvement value is higher for unsubsidized inland properties than for unsubsidized coastal properties might be reversed.

values.[13] For example, if the amount of the subsidy increased at an annual rate of 3 percent, then a 40-year subsidy currently equal to $500 that is fully capitalized at 10 percent would increase a property's value by about $7,300. An indefinite subsidy of $2,000 today capitalized at 7 percent would add $53,500. (Those figures do not correspond to the present-value cost to the Treasury. That cost would reflect a lower discount rate and account for the fact that part of the subsidy cost is borne through lower reimbursements for sales expenses to the private insurance companies that typically sell the policies.) The subsidies help raise property values in inland areas as well; there, however, recent construction evidently is occurring in more desirable locations (for example, outer suburbs versus central cities) and that difference outweighs the effect of the subsidies.

The same patterns are seen for overall property values: Both Table 2 and Table 1 show that subsidized properties tend to be more valuable than unsubsidized properties in coastal areas and that the opposite is true in inland. The figures in Table 1, which reflect larger sets of properties and the estimated property values from the MSB model, show that the average and median values of subsidized properties are 11 percent and 16 percent higher, respectively, than are those of unsubsidized properties in coastal areas but 12 percent and 24 percent lower in inland areas.[14]

Distributions of Property Values

The full distributions of property values are represented in Figure 1, which shows the fraction that falls within each of a dozen intervals. (To conserve space in Figure 1, the last two intervals are 10 and 30 times larger than the others. To avoid making the distributions appear to be artificially dense in those intervals, the values depicted there are the average densities over the 10 or 30 "subintervals" they contain.)

The distributions of coastal and inland property values are similarly shaped, with the greatest concentrations either in the $100,000–$200,000 range or in the $200,000–$300,000 range. The main differences among the four distributions can be described qualitatively in terms of the location and height of the peak and by the sharpness or gradualness with which the distributions decline from the peak. The differences are consistent with the differences in medians and averages. For example, the fact that subsidized coastal properties tend to be more valuable than unsubsidized coastal properties is reflected in the lower peak and slower decline of the subsidized coastal distribution. Similarly, the high early peak and sharp decline of the distribution of the values of subsidized inland properties reflect their lower values, on average, than unsubsidized inland properties.

Another way to present the four distributions is in terms of the fractions that are worth more than certain threshold values (see Figure 2). Forty percent of subsidized coastal properties are valued above $500,000, for example, as are 20 percent of subsidized inland properties. The figure also shows that the distributions of subsidized and unsubsidized properties are broadly similar, although subsidized coastal properties tend to be somewhat more

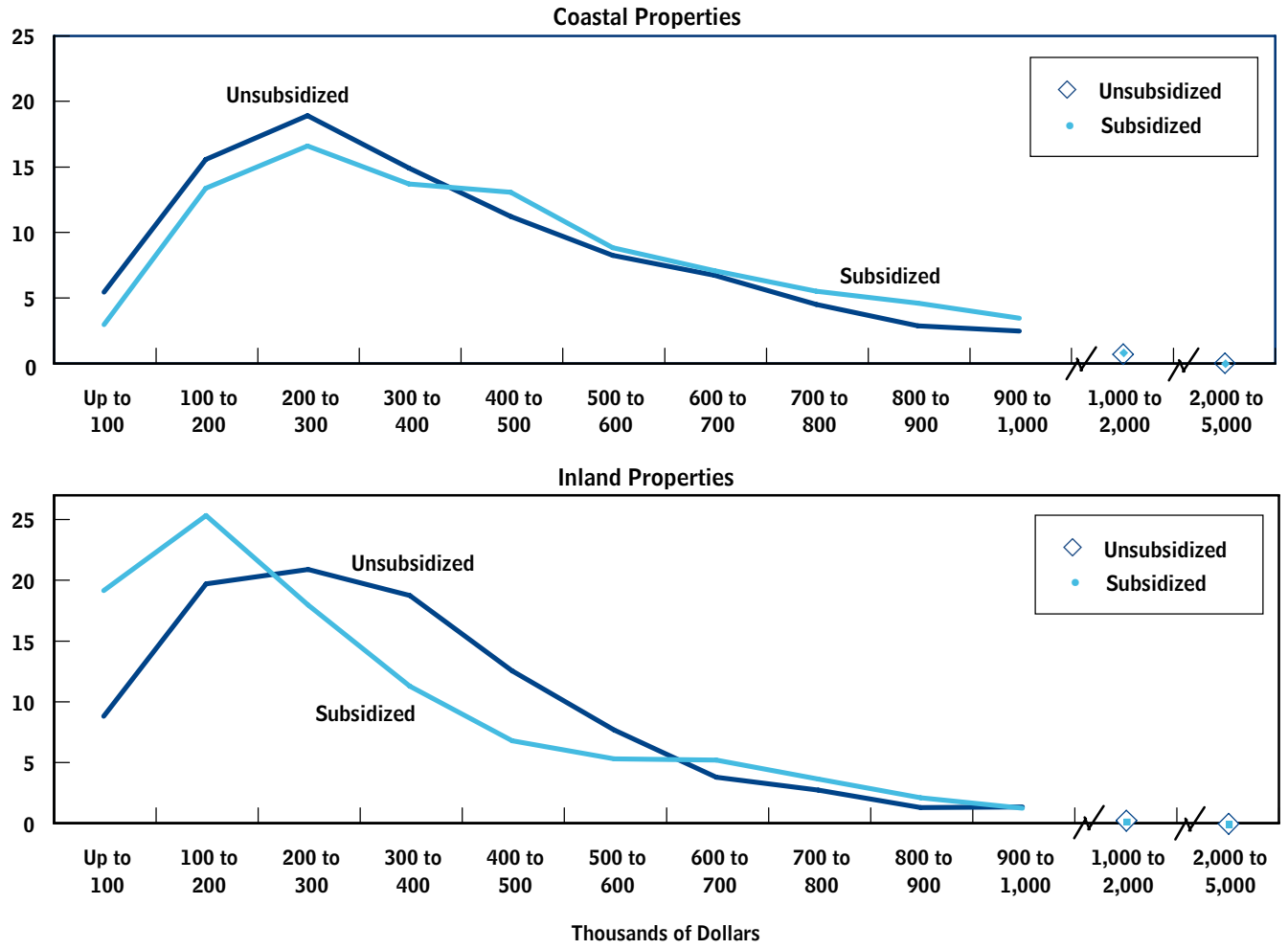
13. In property assessment data, land value is everything that remains after subtracting the replacement cost of the improvements from the total property value. Thus, although flood insurance covers damage to structures or their contents, the impact of the subsidies on property values is captured in the land values.

14. The differences in the average values of subsidized and unsubsidized properties are highly significant in statistical terms, as are the differences in the medians. The probabilities that the observed differences in the averages reflect only random fluctuations around the same "true" average, rather than real differences in the underlying distributions, are .0003 for coastal properties and .0001 for inland properties. It is difficult to calculate analogous figures for the probabilities that the medians are equal. However, the 99.9 percent confidence intervals for the true medians do not overlap: In coastal areas, the probability is less than .001 that the true median is higher than $390,600 for unsubsidized properties or less than $404,500 for subsidized properties; inland, the probability is equally small that the true median exceeds $255,000 for subsidized properties or falls below $287,300 for unsubsidized properties.

Figure 1.

Value Distributions of Sampled NFIP Properties

(Percentage of properties)



Source: Congressional Budget Office.

Notes: The first ten intervals span $100,000 each; the last two span $1 million and $3 million, respectively. To conserve space, the last two intervals are 10 and 30 times larger than the others. To avoid making the distributions appear artificially dense in those intervals, the values depicted there are the average densities over the 10 or 30 "subintervals" they contain.

NFIP = National Flood Insurance Program.

valuable than unsubsidized coastal properties, and the reverse is true for inland properties.

Nonprincipal Residences: Vacation and Rental Properties

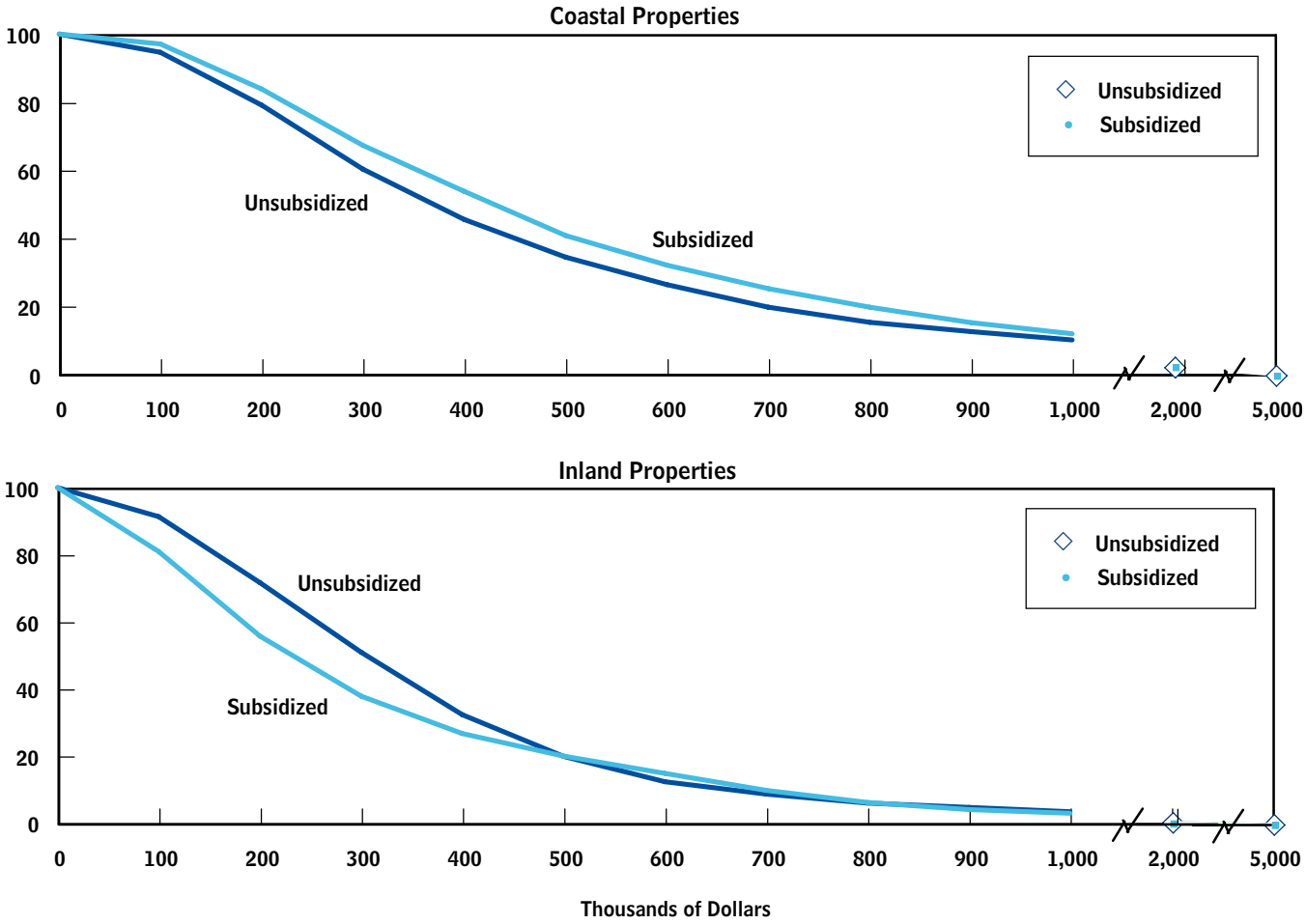
FEMA's data classify residential property as a policyholder's principal or nonprincipal residence.[15] In the sample, 23 percent of the subsidized coastal properties and 13 percent of the subsidized inland properties are single-family homes that are not the policyholders' principal residences. Those residences include second homes

15. FEMA defines a principal residence as one occupied by the policyholder or policyholder's spouse during at least 80 percent of the previous year (or of the period of ownership, if less than one year). Its records can list the same residence as both nonprincipal (in data on a policy purchased by the landlord to insure the structure) and principal (in data on a contents policy purchased by the tenant).

Figure 2.

NFIP Properties with Values Exceeding Specified Amounts

(Percentage of properties)



Source: Congressional Budget Office.

Note: NFIP = National Flood Insurance Program.

and vacation homes, which have attracted particular attention from policymakers, and rental properties that are the principal residences of their tenants. (The analysis here of nonprincipal residences focuses on single-family properties—more than 90 percent of all properties in the data samples—because they are less likely than multi-family residences to be used as rental properties with full-time tenants.)

Coastal homes that are not the policyholders' principal residences generally are more valuable than are coastal homes that are principal residences. Subsidized coastal single-family homes that are nonprincipal residences are worth $634,000, on average, which is 20 percent above the average value of $530,000 for principal residences (see Table 3). The difference in average value between nonprincipal and principal residences is even larger for the corresponding groups of unsubsidized properties. The pattern of subsidized coastal properties being generally more valuable than unsubsidized coastal properties does not hold for the nonprincipal single-family homes; if anything, they may be somewhat less valuable, although the difference in averages ($634,000 versus $677,000) is not statistically significant.

Table 3.

Average Value of NFIP Nonprincipal and Principal Single-Family Residences

	Nonprincipal Residences			Principal Residences		
	Number of Properties	Percentage of Subsidies in Region	Average Value	Number of Properties	Percentage of Subsidies in Region	Average Value
Subsidized Coastal	568	22.7	$634,016	1,675	66.8	$529,919
Unsubsidized Coastal	434	n.a.	$677,131	1,843	n.a.	$468,338
Subsidized Inland	269	12.9	$320,185	1,679	80.3	$306,995
Unsubsidized Inland	301	n.a.	$393,966	2,690	n.a.	$361,654

Source: Congressional Budget Office.

Notes: Percentages of subsidies do not add to 100 because multifamily and nonresidential properties are not included.

NFIP = National Flood Insurance Program; n.a. = not applicable.

There is only a slight difference, not statistically significant, in the value of principal ($320,000) and nonprincipal ($307,000) subsidized inland single-family homes. However, the difference in the average value of inland subsidized and unsubsidized single-family properties that are not principal residences ($320,000 and $394,000) is statistically different, and it suggests that older properties are less valuable.

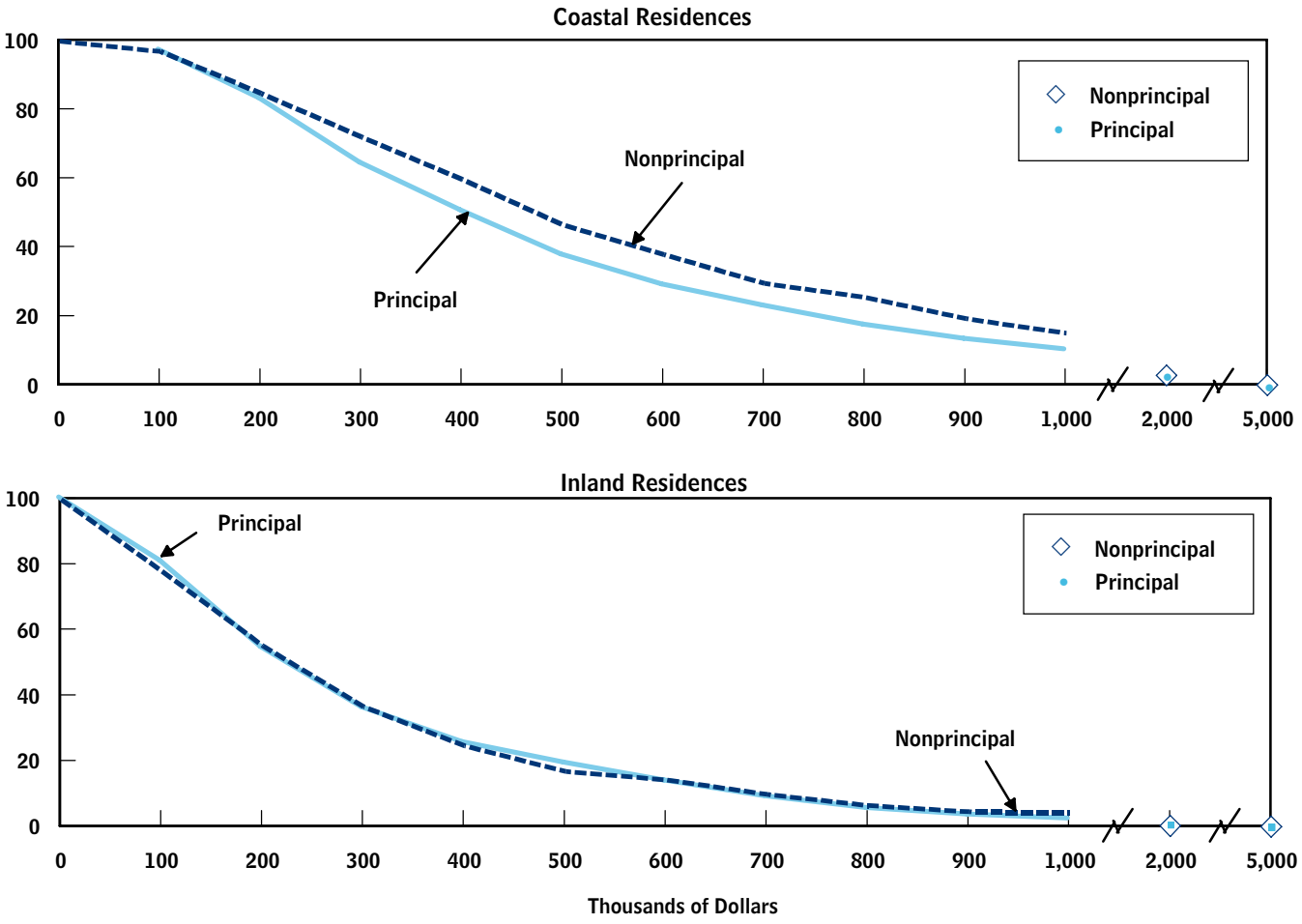
Consistent with the average values in Table 3, the fractions of properties that exceed given threshold values are somewhat higher for coastal subsidized single-family homes that are not policyholders' principal residences (see Figure 3, top). For example, 47 percent are worth more than $500,000 and 15 percent are valued at more than $1 million. In contrast, 37 percent of coastal subsidized principal residences are valued above $500,000 and 10 percent are worth more than $1 million. The distributions of value in inland areas for subsidized single-family principal residences and nonprincipal residences are nearly identical (see Figure 3, bottom).

Nonresidential properties also tend to have high values. Average values of the properties in the sample exceed those for residential properties by 80 percent or more for each of the four combinations of region and subsidy status. In particular, the average value of subsidized nonresidential properties is $1 million in coastal areas and $730,000 inland. However, nonresidential properties represent only a small share of those covered by flood insurance—less than 6 percent nationwide, according to FEMA.

Figure 3.

Subsidized Single-Family Residences with Values Exceeding Specified Amounts

(Percentage of properties)



Source: Congressional Budget Office.