

DETAILED RESEARCH FINDINGS

An Assessment of the 1998 California Natural Hazard Disclosure Law (AB 1195)

Austin Troy and Jeff Romm

Policy Research Program



CALIFORNIA POLICY RESEARCH CENTER
UNIVERSITY OF CALIFORNIA

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Related Publications

A more technical version of the portion of this report dealing with the price effects of flood-hazard disclosure appeared in the *Journal of Environmental Planning and Management*, 47(1):137–162, 2004. It may be obtained from CPRC by calling (510) 642-5514.

A more technical version of the portion of this report dealing with the price effects of wildfire-hazard disclosure will appear as a chapter in *Living on the Edge: Economic, Institutional, and Management Perspectives on Wildfire Hazard in the Urban Interface*, edited by Austin Troy and Roger Kennedy for Elsevier Sciences Publishers, and expected to be published in early 2007. This volume will also contain a chapter with further details on the California Fair Access to Insurance Requirements (FAIR) Plan and on Very High Fire Hazard Severity Zone mapping policies, in addition to chapters on fire-hazard mitigation planning and policy in the urban-rural interface zone. Readers are advised to consult the following website for publication information in early 2007:
www.elsevier.com/wps/find/bookdescription.cws_home/BS_AECE/description.

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EXECUTIVE SUMMARY

Many California homes are vulnerable to natural hazards such as earthquakes, fires, and floods. If homebuyers are unaware of this vulnerability, their bids will not adequately reflect the costs and risks associated with residence in such locations. Insufficient information in transactions can lead buyers to pay more than their purchase is worth, producing an inequitable outcome. It can also produce misallocations of land by giving distorted price signals that potentially lead to overdevelopment of areas subject to major natural hazards.

In 1998, California passed the Natural Hazard Disclosure Law (AB 1195) to systematize and improve disclosure of natural hazards in real-estate transactions. The law requires sellers of a residence in statutory flood, wildfire, and seismic zones to inform potential buyers of the hazards that may affect the property by making available a written Natural Hazard Disclosure Statement before the sale is completed.

Unlike many previous disclosure requirements, AB 1195 appears to have a high rate of compliance because it clearly articulates where sellers and real-estate agents are liable for disclosure and protects them from liability exposure due to error, omission, or inaccuracy in the disclosure. Under AB 1195, that liability can be transferred to a third-party company hired by the seller to prepare the report, usually for a fee of \$50 to \$100—an incentive missing from previous state and federal disclosure requirements.

In our study we assess the effects of hazard disclosure on housing prices in statutory flood- and fire-hazard zones and analyze whether those effects were conditioned by race/ethnicity, income, and previous occurrence of hazards in those zones. In particular, we examine whether, all else being equal, housing prices in hazard zones declined after AB 1195's implementation, and whether these declines were largest for populations among whom disclosure was least complete before AB 1195.

We analyzed over 20,000 housing transactions that took place in 63 zip codes across California, representing both urban and rural areas, from January 1997 to February 2000. We also used mail surveys to determine the extent and timing of disclosure, the influence of prior knowledge of hazards on bids, and perceptions of the relative danger of different types of hazards.

FLOOD-HAZARD DISCLOSURE

Effect on Home Price

We found that before AB 1195 the average floodplain home sold for the same amount as a comparable non-floodplain home, indicating the inadequacy of disclosure under the National Flood Insurance Program (NFIP, the primary pre-AB 1195 policy regulating flood-hazard disclosure in California and the rest of the nation). After AB 1195, a floodplain home sold for 4.1% (\$8,000) less than a comparable non-floodplain home. This result indicates that flood-hazard disclosure under AB 1195 is more complete than under the federal guidelines that regulated disclosure prior to AB 1195's implementation. The price effects of flood-hazard

disclosure were unaffected by income levels within a census tract, but strongly dependent upon racial/ethnic characteristics.

Explaining the Variation by Race/Ethnicity

There are two likely causes for the association between race/ethnicity and the lower post-AB 1195 sale price. First, Hispanics have a disproportionately large population share in floodplains relative to other racial/ethnic groups. This partially explains why any increase in rates of disclosure to Hispanics would have a significant impact on the post-AB 1195 floodplain premium. Second, we hypothesize that flood-hazard disclosure under AB 1195 is correcting disparities between Hispanics and whites with respect to the adequacy of transfer disclosure done under NFIP regulation. In our view, AB 1195 flood-hazard disclosure affects Hispanic communities most because it occurs independently of the mortgage-origination process, while NFIP disclosure is triggered through the mortgage-origination process and Hispanics are far more likely than whites to obtain loans from poorly regulated “subprime” mortgage lenders.

FIRE-HAZARD DISCLOSURE

Effect on Home Price

The price effect of fire-hazard disclosure is less clear-cut than that for flood-hazard disclosure. Location in a statutory fire zone is actually associated with a 3% positive price premium both before and after AB 1195. However, the combination of proximity to recent fire perimeters and post-AB 1195 disclosure does have a negative effect on selling price. If a home in a statutory fire-hazard zone is within five kilometers of the site of a major fire that occurred in the last five years, it sold for 5.1% less (or \$10,600 less for the average home) after AB 1195’s implementation than a comparable home in a statutory fire zone that is not near the site of a recent fire.

No such effect was apparent before the law’s passage, indicating that state-level fire-disclosure requirements were inadequate before AB 1195. Hence, while this law does not appear to have induced a noticeable general decrease in home prices in fire-hazard zones, it does appear to have reduced prices somewhat in statutory hazard zones near the sites of recent major fires. It is not disclosure, nor being near the site of a recent fire, but their combination that results in reduced home prices.

Insurance pricing and availability may significantly influence the price effects of fire-hazard disclosure. Prior to AB 1195, many potential homebuyers in fire-zone areas may not have realized that their prospective home was in a hazard zone and that they would either have difficulty getting adequate insurance coverage or would need to pay more for that coverage. After the law’s implementation, homeowners were probably more aware that they lived in such a zone and potential buyers were probably more concerned about the availability and affordability of insurance, especially in areas near a recent fire.

Insurance Market Distortion

Market-rate insurance pricing and availability help send price signals to consumers about the risks associated with properties on the market. The price effects of disclosure would be much greater if California had a functioning market for fire insurance—one that adequately reflects the

presence of this risk. Instead, the insurance market is sending inaccurate price signals to homebuyers because it has been forced to provide below-cost insurance for wildfire hazards.

Historically, fire insurance has been difficult to obtain or very expensive in many urban-wildland interface zones in California, which has helped to limit development in the most hazardous areas. This changed with California's Fair Access to Insurance Requirements (FAIR) Plan, instituted in 1968, which offers basic homeowner's insurance to property owners in brushfire zones who are unable to obtain it in the private market. Rising rates of FAIR Plan coverage in brushfire zones in recent years is an indicator that there is a significant problem in the private insurance market in California, since that means that an increasing number of homeowners are unable to get insurance through the private market.

Because the FAIR Plan forces insurance companies to underwrite insurance policies in highly hazardous areas that they would not normally insure for rates that do not cover their risk, in essence this program provides a subsidy to those living in hazardous environments and distorts the market-based allocation of risk by spreading its costs to all ratepayers. This incentive serves not only to mislead many consumers, giving them a false sense of security, but also to subsidize more development of hazardous areas than the market would otherwise encourage.

In June 2001 the allowable geographic coverage areas for the FAIR Plan were changed to effectively extend its brushfire coverage to all parts of the state. Not only is this likely to create an incentive for further overdevelopment in hazardous areas, but it is likely to mute the effects of disclosure in influencing consumer behavior even more.

Inconsistent Designation

A significant problem affecting fire-hazard disclosure is that statutory fire zones, particularly the Very High Fire Hazard Severity Zones (VHFHSZs), are inconsistently mapped and thereby fail to include some of the most hazardous areas of the state. Because the state government, through the Department of Forestry and Fire Protection, lacked the power to effectively oversee local designation and mapping of these zones, they were unable to do more than make recommendations. Many localities arbitrarily rejected these recommendations, leaving some of the most hazardous developed land in the state undesignated as fire-hazard zones.

In these undesignated hazardous areas (such as the Oakland Hills, where the 1991 fire took 25 lives and caused over \$1 billion in damage), homebuyers do not receive disclosure and often remain unaware that they are living in a hazard zone until a fire occurs. For residents in these areas, having a statewide disclosure system but no map designating these areas hazardous is worse than having no disclosure system at all, for it can lead people into a false sense of security and encourage overdevelopment of some of the most hazardous areas.

POLICY RECOMMENDATIONS

- **FAIR Plan brushfire coverage should be restricted to existing structures and should not be made available to new development in the most hazardous areas.**

The availability and pricing of insurance appear to have a strong influence on residential choices with respect to fire hazard, especially where there has been a recent nearby fire. Our results suggest that the effects of fire-hazard disclosure on consumer behavior are muted if there is not a functioning insurance market that is accurately pricing risk. Because FAIR Plan coverage is available at affordable rates, regardless of risk, it is likely that many homebuyers are discounting the importance of fire risk, even if they do see a Natural Hazard Disclosure Statement.

FAIR Plan brushfire coverage also subsidizes development in hazardous areas at the expense of ratepayers in nonhazardous areas. This not only can lead to overdevelopment in fire-hazard zones, but can also reduce awareness of risk among homeowners. Allowing the private market to price insurance for new development in fire-hazard zones will result in a more efficient development pattern, will keep more people and property out of harm's way, will save lives and property, and will reduce the societal costs of major fires.

AB 2444, Assemblyman Dutton's bill proposed in 2003-4 but never passed into law, would have helped keep track of how many FAIR Plan brushfire policies are being written over time and what the probable losses are in those fire zones. By documenting with hard data the increases in the number of such policies, and the exposure of the FAIR Plan participants to risk, this bill would have helped show the divergence between the levels of risk that the private market and state FAIR Plan are willing to cover and perhaps have led to reforms in the FAIR Plan.

- **Where housing supply is highly limited and fire hazard is prevalent, a few selected zones could be designated in which FAIR Plan insurance would be made available for new development.**

The designation of zones where FAIR Plan brushfire insurance would be available for new development could serve as a tool for rationally guiding and planning development in a few high-hazard areas, where land supply is constrained. These zones could be designated by the California Department of Insurance in coordination with the California Department of Forestry and Fire Protection and each municipality. By keeping the number and size of these zones small, state and local planners can more effectively manage and mitigate the risk and raise awareness of its presence among residents.

- **Statutory fire-hazard zones should be remapped.**

The haphazard process by which statutory fire-hazard zones, particularly the VHFHSZs, were mapped has led to misleading representations of fire risk. This can lead to a false sense of security to the many thousands who live in hazardous areas that are not mapped and hence are not reported on disclosure forms. The California Department of Forestry and Fire Protection

should be given statutory authority to map all fire-hazard zones in the state and to require localities to recognize those zones, even for jurisdictions that have their own fire department.

- **All landslide-hazard zones, of whatever kind, should be mapped and added as zones requiring transfer disclosure.**

The current disclosure form, whose list of hazards appears quite exhaustive, may mislead residents into thinking that their property is free from natural hazards. However, it omits one of the most catastrophic sources of hazard—slope areas subject to non-seismically induced landslides. Furthermore, although many seismic-hazard areas have been mapped for part of the state, this mapping effort should continue for the entire state, and the resulting map should be the basis for an additional statutory hazard zone.

- **Federally unregulated mortgage lenders should be audited.**

Although AB 1195 puts responsibility on the seller and agent for flood disclosure, mortgage originators still have an important role to play. The federal and state governments should conduct an audit of subprime mortgage lenders to determine whether they are less compliant with flood-hazard designation and disclosure requirements than federally insured mortgage lenders are. Audits should also be conducted to determine the extent to which Hispanics and other minority groups disproportionately use subprime lenders.

- **At the federal level, the disclosure-triggering mechanisms of the National Flood Insurance Plan should be altered.**

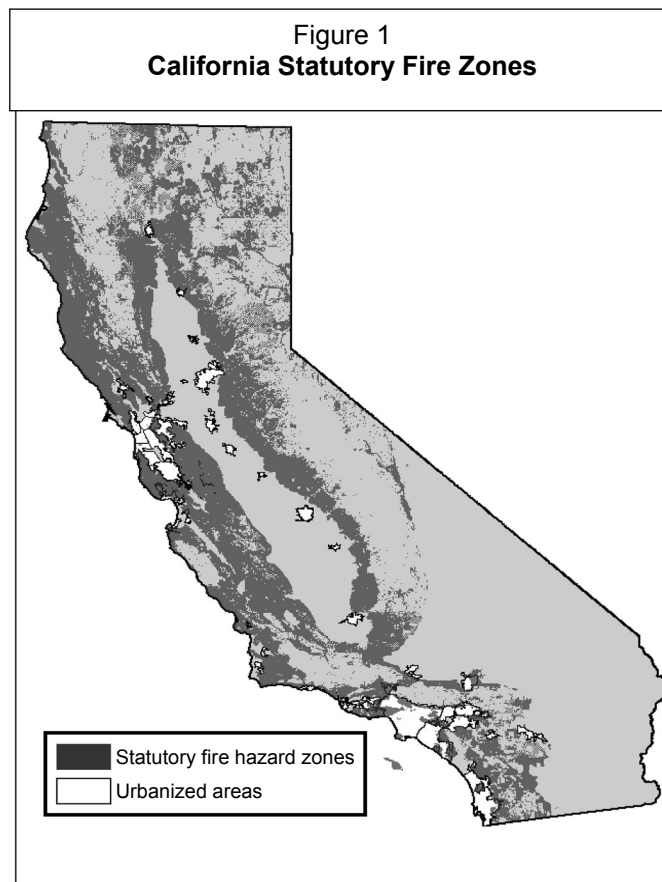
Currently, disclosure under the NFIP is triggered through the mortgage-origination process. Differences in selection of mortgage originators among different populations then lead to systematic disparities in rates of disclosure. In particular, it appears that those who obtain a mortgage through the subprime sector are given little or no information about the presence of hazards affecting their property. Given the success of the disclosure mechanisms under AB 1195, it is recommended that Congress amend the National Flood Insurance Act to require disclosure requirements and mechanisms similar to those enacted in AB 1195.

- **Other states should be encouraged to follow the example of AB 1195.**

AB 1195 requires the seller or agent to be responsible for disclosure, rather than a bank or mortgage originator. It also transfers liability for errors and omissions from sellers and agents to third-party mapping contractors, thereby increasing sellers' and agents' incentives for hazard disclosure and providing certainty and predictability for them—perhaps the primary reason for the extensive compliance with the law. In particular, it is a significant improvement over the NFIP disclosure requirements, which are minimum nationwide standards.

INTRODUCTION

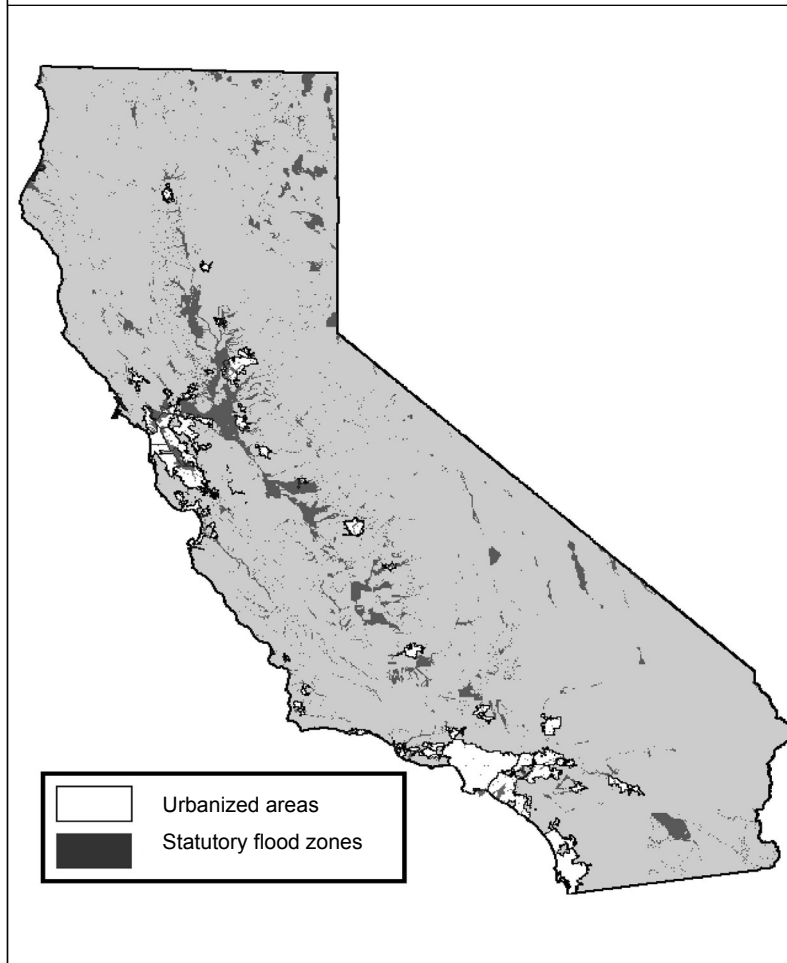
With its high population densities and significant development pressures, combined with the near ubiquity of natural-hazard zones (Figures 1 and 2), California faces some of the most severe challenges in natural-hazard management in the nation. From sprawling floodplain cities in the Central Valley to exclusive suburbs in wildfire hazard zones on the fringes of Los Angeles, hazard and development are inseparable. Recent high-value flood and fire disasters are illustrative: the 1991 Oakland Hills Fire, \$1.9 billion in damages; the 1993 Southern California firestorms, \$1 billion; the 1997 Central Valley floods, \$2 billion; the 1999 statewide firestorms, 1,376 structures destroyed. Insurance providers have raised premiums or stopped offering fire insurance altogether in many areas of California that have a recent history of wildfire.¹ Urban ratepayers in the state subsidize rural and fringe ratepayers, who pay \$1 in fire-insurance premiums for every \$1.09 in costs incurred by the insurance provider.² As damage from natural disasters increases, the financial burden of government disaster assistance and hazard mitigation increases at the state and federal levels.



¹ Irby et al. (1999).

² California Department of Forestry (1995).

Figure 2
California Statutory Flood Zones



Reliance on structural protections (e.g., levees), emergency responses, public insurance, and disaster aid may suffice in parts of the nation with lower-density populations, lower development pressures, or less frequent or fewer kinds of natural catastrophes. In California, however, the combination of high development pressures and prevalent hazard zones creates problems that are beyond the reach of public modes of action alone. In the face of inadequate public-policy mechanisms to deal with the financial impact of natural hazards, the state government has begun to harness market processes to transmit information about and internalize the costs and risks of residing in hazardous locations.

California attempted to address these problems in 1998 by passing a law regulating natural-hazard disclosure in property transactions (AB 1195).³ This law requires sellers to complete a Natural Hazard Disclosure Statement disclosing whether the property in question is located in publicly mapped wildfire-, flood-, and seismic-hazard zones. In theory, such information should enhance the efficiency of market allocations of land and development in hazardous areas, making prices and insurance premiums better reflect the costs and risks associated with living in hazard zones. Better information about the presence of hazards is expected to reduce the price of hazard-zone properties

³ Originally California Civil Code § 1102.6c, now Civil Code § 1103.

relative to comparable non-hazard-zone properties by increasing buyers' knowledge of the risks and additional expenses associated with living in them.⁴

Does natural-hazard disclosure reduce the price of hazard-zone properties relative to comparable non-hazard-zone properties? If so, might this redistribute settlement away from hazardous areas and reduce the cost of structural, emergency, and regulatory forms of protection, or contain levels of public compensation for damages? Is reliable market information an effective policy substitute for other public forms of response to the potential impacts of natural hazards on property owners and public expenditures? If disclosure does affect property markets, do these effects vary with neighborhood racial/ethnic composition or income? Experience with the implementation of AB 1195 offers a basis for answering these questions.

This study examines the effects of AB 1195 on property values in wildfire- and flood-hazard zones throughout California. Through a mail survey of recent homebuyers, we evaluated the extent to which AB 1195 provisions have actually been put into practice. We isolated sales-price differentials in statutory flood and fire zones before and after AB 1195 to determine how disclosure has affected prices. We also explored whether income, race, or local experience with disasters affected these price differentials.

We found that disclosure under AB 1195 has reduced property values in some hazardous areas, but not all. Our results indicate that flood-hazard disclosure under AB 1195 has had a negative price effect. This shows that disclosure was inadequate under the preexisting National Flood Insurance Program (NFIP) requirements and that AB 1195 better informs consumers. However, the negative price effect of flood disclosure under AB 1195 is not distributed uniformly across the population; it is mostly accounted for by heavily Hispanic neighborhoods. This suggests that the mechanisms of disclosure under the NFIP (which was triggered through the mortgage-origination process) may have had a biased effect in that its disclosure mechanisms reached fewer Hispanic homebuyers and that AB 1195 helped correct this bias. This disparity in disclosure levels under the NFIP might be due to differences in home-financing methods in California between Hispanic and non-Hispanic buyers.

Wildfire-hazard disclosure, on the other hand, has had little effect except in areas that have experienced wildfire in the recent past. This result may be related to the increased difficulty of getting adequate fire-insurance coverage in recent fire areas, combined with increased homebuyer awareness of the fire risk, as facilitated by the disclosure form. These results suggest that the price effects of disclosure may be conditioned by government policies that regulate the availability and pricing of hazard insurance.

⁴ MacDonald et al. (1987) and Kask and Maani (1992). The decrease in value due to disclosure consists of the capitalized value of the added expenses, such as insurance, flood- and fire-proofing costs, plus an "option price," or risk-aversion premium that compensates for the uncertainty of potential damages and injuries in excess of insurance coverage.⁴ While one can calculate how much less the "rational" consumer will be willing to pay for a property based on added expenses, the price effect of risk aversion is far more difficult to predict because of various biases in the way that consumers translate perceived risks into financial terms.

PREVIOUS HAZARD-DISCLOSURE REQUIREMENTS

While there is a common-law obligation to disclose material fact in real-estate transactions, statutory hazard-disclosure requirements prior to AB 1195 were few and weak.⁵ This is important because among the many facts that are material under common law, disclosure of potential hazards is frequently ignored, primarily because the seller, the buyer, and their agents are unlikely to know a location's hazard-zone status without a professional opinion. Without statutory backing, such as that provided by AB 1195, the only way that nondisclosure can be addressed is through litigation.

The NFIP⁶ requires real-estate transfer disclosure for houses in special flood-hazard areas⁷ for which the purchase of NFIP insurance is mandatory, but disclosure has traditionally occurred inconsistently because the program is designed less to protect consumers than to protect the federal government's financial interests. Under the NFIP, disclosure is merely a by-product; the primary objective is to get as many homeowners as possible paying into the system so as to offset the costs of disaster assistance. When Congress amended the National Flood Insurance Act in 1974, flood insurance became mandatory for special flood-hazard area properties with federally regulated mortgages and mortgages that were sold on the secondary market to the Federal National Mortgage Association (FNMA, or Fannie Mae) and the Federal Home Loan Mortgage Corporation (FHMC, or Freddie Mac).

This arrangement left many homebuyers and some sectors of the mortgage industry unregulated by the NFIP, and hence not subject to disclosure requirements. In addition to those buyers who purchased with cash or personal loans from family, this included those who obtained financing through non-federally regulated mortgage companies, including subprime lenders.⁸ Although little data exist on this, it is believed that subprime lenders often conduct flood-hazard designations only when they resell their investment-grade mortgage portfolios on the secondary market to FNMA and FMHC or to a federally regulated bank or savings and loan association, all of which require a federally compliant mortgage contract that calls for flood determinations and mandatory insurance purchase for designated flood-zone properties.

When FMHC and FNMA started returning investment-grade mortgage portfolios to mortgage companies if one property in them had been damaged in a flood, many mortgage companies

⁵ Under common law, disclosure of "material fact" in any transaction is required. In 1984, the California Court of Appeals clarified and affirmed the common-law duty of real-estate brokers to research and disclose material facts, stating that "a real estate broker is under a duty to disclose facts materially affecting the value or desirability of the property that are known to him or which through reasonable diligence should be known to him" (*Easton v. Strassburger*, 152 Cal. App. 3d 90, 98). Courts have found in numerous cases that location in any natural-hazard zone that could be associated with future property damage is material.

⁶ To participate in the NFIP, communities agree to adopt and enforce certain floodplain management ordinances to reduce the probability of future flood damage to new buildings in the special flood-hazard area. In return, the community becomes eligible for federal disaster assistance and homeowners become eligible for flood insurance as a financial protection against flood losses.

⁷ The special flood-hazard area is defined as an area that has a 1% or greater chance in any given year of flooding. The 100-year floodplain, or class A zone, falls under this designation.

⁸ Subprime lenders specialize in originating high-interest loans to homebuyers with impaired credit histories. Because the homebuyers are limited in their financing options, these lenders can charge extremely high interest and provide unfavorable terms and limited information to the buyer.

responded by conducting determinations and requiring mortgage holders to buy insurance. However, this was frequently done in the middle of the term of a mortgage.⁹ Many unaware homeowners were told by the lender that they were in a special flood-hazard area, *and* that they had to buy flood insurance—frequently long after they bought their houses.¹⁰ From the perspective of market efficiency, disclosure after the transaction is of little utility because the price will not reflect the costs and risks associated with the location and, hence, consumers will overpay for the property. Moreover, with the rise of subprime lending, there is increasing concern for the consistency of NFIP flood disclosures since these institutions, on average, resell mortgages much less often to federally regulated sources and so are subject to much less regulation. As discussed under “Race, Ethnicity and Hazard,” Hispanics are far more likely than non-Hispanic whites to originate a mortgage with subprime lenders.

CALIFORNIA DISCLOSURE REQUIREMENTS

Since 1985, state law has required a seller and his or her agent to disclose all “material facts” about the condition of a property.¹¹ The Seymour-Petris Act created a transfer disclosure statement (TDS) that focuses mainly on structural factors, such as the condition of the plumbing and the roof. As for hazards, it only asks the seller or agent to disclose whether the property has undergone a natural event, such as flooding, not whether the property is located in a hazard zone, i.e., is subject to potential natural hazards. The “Other” blank on the transfer disclosure statement became by default the primary location where real-estate agents disclosed natural hazards requiring written disclosure, since a specific form for disclosing multiple natural hazards was lacking prior to AB 1195. The extent to which real-estate agents have been completing the form is difficult to ascertain. However, prior to AB 1195 it is likely that many real-estate agents were not aware of their obligation to disclose for some natural hazards (especially fire), a situation that was probably exacerbated by the lack of mention of natural hazards on the form.¹²

Before AB 1195, several statutes did call for certain types of natural-hazard disclosure. In addition to two seismic-hazard disclosure laws (the Alquist-Priolo Special Studies Zones Bill and the Seismic Hazard Mapping Act¹³), AB 1812 (1989) required residential transfer disclosure if houses were located in State Responsibility Area (SRA) fire zones.¹⁴ State Responsibility Areas are fire-hazard zones located where no local fire department exists, and where the California Department of

⁹ They could do this because of the often ignored, but still legally binding, insurance requirement clause in the standard contract.

¹⁰ Interview with Jack Eldridge, community mitigation program branch chief for FEMA Region IX (2000), which includes California.

¹¹ California Civil Code § 1102.6.

¹² The American Association of Realtors has trademarked the term REALTORS® for real estate agents. From interviews with Stan Wieg, California Association of REALTORS® (1999 and 2001).

¹³ The 1972 Alquist-Priolo Special Studies Zones Bill (sections 2621-2630 of the Public Resources Code) called for transfer disclosure of a property’s location in potential earthquake-fault rupture zones in certain “special study” areas along the San Andreas, Calaveras, Hayward, and San Jacinto faults. The Seismic Hazards Mapping Act of 1990 (sections 2690-2699 of Public Resources Code) called for disclosure in mapped areas of seismically induced ground shaking, liquefaction, and landslide zones (more-specific zones than the designation under the Alquist-Priolo bill).

¹⁴ Public Resources Code section 4125.

Forestry and Fire Protection (CDF) has responsibility for fire protection. The disclosure provision informed buyers that they must maintain 30 feet of vegetative clearance around their homes and install spark arresters. None of the disclosure laws mandated new forms that prospective homebuyers would see; instead all called for real-estate agents or sellers to disclose in the “Other” section of the TDS form.

Confusion and noncompliance disabled these early disclosure laws. Natural-hazard disclosure requirements supposedly were not well known among real-estate agents because they were located in the Resources Section of the California Code. Real-estate advisors typically overlooked this code section because so little of it pertained to their industry.¹⁵ The dispersion of disclosure requirements among three different sections of code exacerbated this neglect. Most agents and brokers likely did not know about these requirements. Where they did, there was little threat of enforcement and few incentives, such as transference of liability, to encourage disclosure.

AB 1195 emerged in a context where disclosure was haphazard, poorly publicized, and infrequently done. Legislators realized that for disclosure to affect markets, the law needed to be publicized, incentives and disincentives had to be included for sellers and the real-estate industry, and the various natural-hazard disclosure requirements had to be combined into a single entity.

¹⁵ Interview with Peter Detwiler (1999), then staff director of the California Senate Local Government Committee and former staff director of the Senate Committee on Housing and Land Use.

THE CALIFORNIA NATURAL HAZARD DISCLOSURE LAW OF 1998: AB 1195

AB 1195 requires home sellers of properties within designated natural-hazard zones to show prospective buyers a form known as a Natural Hazard Disclosure (NHD) Statement prior to escrow, which informs buyers that the property is potentially subject to these hazards.¹⁶ The hazard zones include:

- ▶ areas of potential flooding in the event of dam failure, designated by the Office of Emergency Services;
- ▶ special flood-hazard areas, corresponding to the 100-year floodplain, designated by the Federal Emergency Management Agency (FEMA);
- ▶ very high fire-hazard severity zones (VHFHSZs), designated by the California Department of Forestry in conjunction with local governments;
- ▶ wildland fire areas, or state responsibility areas, designated by the California Department of Forestry;
- ▶ earthquake-fault zones, designated by the state geologist; and
- ▶ seismic-hazard zones, designated by the state geologist.

The NHD Statement warns buyers that “these hazards may limit your ability to develop the real property, to obtain insurance, or to receive assistance after a disaster.” The NHD form is available from numerous companies in a variety of languages, by request. Once a local agency makes available maps showing parcels affected by the hazard zones, the seller and his or her agent are responsible for disclosing that information. The law additionally requires that homeowners in a flood zone purchase flood insurance, in accordance with the NFIP regulations, and that homeowners in both categories of fire-hazard zones maintain defensible space (no flammable vegetation) within and around their property, in accordance with local fire regulations. These are critical inclusions. By informing potential buyers that living in a hazardous location requires actual expenses as well as abstract risks, the negative consequences of living there are made more concrete and tangible.

AB 1195 consolidated prior state and federal hazard disclosure requirements into one NHD form and added requirements for several new hazard zones. It granted a three-day rescission period during which buyers have the right to terminate a property transfer after signing a contract if proper disclosure was not made. This provision gave sellers and their agents incentive to disclose early in the process rather than at the last minute, as was commonly the case when disclosure occurred in the past. Finally, in contrast to previous hazard disclosure laws, AB 1195 clearly articulated where real-estate agents were liable for disclosure and where they were not. It makes clear which hazards the agent is responsible for disclosing, and it allows transfer of liability to a third-party contractor conducting the hazard report. Since the third-party report generally costs only \$50 to \$100 and frees

¹⁶ Interviews with Peter Detwiler (1998 and 1999), and with Julie Snyder (1999), aide to state representative Hannah Beth Jackson, both of whom who were involved in drafting the law. Information also came from Detwiler’s 1998 article in *Real Estate Reporter*.

the real-estate agent from direct and indirect liability, this change alone may have been enough to drive most real-estate agents to get their clients to disclose. Although the response rate was too low for statistical validity, mail surveys from this study show that a large majority of the homebuyers who responded saw the NHD form and understood it. It appears, however, that many consumers are not aware of the three-day rescission clause. If this clause were better publicized, it is likely that disclosure would occur in a more timely fashion.

AB 1195 has one serious problem relating to VHFHSZ designation. While flood hazards are uniformly mapped across the country, and wildland fire zones in the SRAs are mapped uniformly across the state, VHFHSZs, are mapped inconsistently across local jurisdictions. The 1992 Bates Bill (AB 337) required the mapping of VHFHSZs, within jurisdictions where a local fire department existed, and hence the state was not responsible for fire protection. However, the bill was not designed with disclosure in mind. The bill instructed the CDF to identify VHFHSZs “in cooperation with” local agencies. Local governments could exempt land within their borders from designation as a VHFHSZ under the Bates Bill in several ways: by declaring the “functional equivalence” of local fire-zoning regulations to the state model ordinance, by rejecting the maps recommended by the CDF, by redrawing the maps themselves, or by refusing to comply with the Bates Bill entirely. The state submitted the maps to the local government, which then had 120 days to either accept those maps or amend them; they could also redraw or eliminate them. The CDF has neither the authority nor the resources to verify that a local government has functional equivalence in their ordinances, or that a local government’s remapping was based on good science. Therefore, the local governments’ claims always trumped the state’s. California Government Code gives the local agencies the final word by stating, in section 51179.b, that “A local agency may, at its discretion, exclude from the requirements of Section 51182 an area identified as a very high fire hazard severity zone by the director within the jurisdiction of the local agency, following a finding supported by substantial evidence in the record that the requirements of Section 51182 are not necessary for effective fire protection within the area” and, in section 51179.d, that “changes made by a local agency to the recommendations made by the director (of the California Department of Forestry) shall be final and shall not be rebuttable by the director.”

Many localities have successfully exempted themselves from the zoning ordinances under the Bates Bill (e.g., vegetative clearance around structures) by rejecting the state’s mapping. The question of where disclosure is needed for VHFHSZs has not yet been fully resolved. In the Civil Code section created by AB 1195, disclosure is required for VHFHSZs pursuant to either section 51178 (based on state designation) *or* section 51179 (based on local designation). The state has yet to resolve which takes legal precedence, but due to the wording of the Civil Code section and to avoid potential liability to sellers and disclosure firms, the state recommends that properties in zones identified pursuant to both sections 51178 and 51179 should be disclosed.¹⁷ Despite this recommendation, it is unclear if, when the two maps conflict, disclosure is occurring under the generally more restrictive state mapping standard and if a party could be held liable for disclosing based on the less restrictive map.

¹⁷ Interviews with Melissa Frago (1999 and 2001).

The number of local governments not in compliance with the Bates Bill highlights the extent of the problem with fire-zone mapping. As of 1999, of 209 jurisdictions with VHFHSZs mapped by CDF, only 99 did not challenge the designation (group 1). Fifty-two claimed that they “meet or exceed” the Bates Bill minimums (group 2), and 58 “exempted” themselves (group 3), declining to participate either due to political reasons or local findings that the state mandate was not necessary for effective fire protection in their area.¹⁸ All jurisdictions were free to reject state VHFHSZ mapping and were under no obligation to provide their own mapping. Of the 52 in group 2 and the 58 in group 3, respectively 10 and six adopted some kind of fire-hazard zone—although in most cases not the state-designated VHFHSZ. All jurisdictions in groups 2 and 3 are technically exempt from any fire-hazard disclosure requirements for a Local Responsibility Area, even though many of these jurisdictions contain extremely flammable landscapes. Without an official VHFHSZ in the jurisdiction, most subsequent state laws regulating activities within fire hazard zones do not apply to the jurisdictions.¹⁹

The overall effect of this problem is that many people who live in hazardous areas are misled into a false sense of security when purchasing a home because the NHD form asserts that no known hazard exists. Moreover, disclosure could be highly inconsistent within a contested VHFHSZ. Sellers using the state maps might disclose the hazards, while sellers using local maps might not.

¹⁸ Irby et al. (1999).

¹⁹ The reasons why certain municipalities embraced these regulations while others did not are beyond the scope of this study.

METHODS²⁰

HEDONIC ANALYSIS OF PROPERTY VALUES

We used hedonic analysis to isolate the price effects of disclosure under AB 1195. In hedonic analysis, the observed price of a good is disaggregated into a schedule of implicit, or unobserved, marginal attribute prices through multiple regression.²¹ Hedonic pricing is particularly suited for studying housing prices, because the value of a property is determined by many quantifiable attributes, such as number of bedrooms, distance to amenities, and square footage; and by relating these to price, the consumer willingness to pay for marginal changes in these attributes can be derived.

In this study, sales price was regressed against a number of explanatory variables relating to the neighborhood, locational, and structural characteristics of each house, in addition to variables for flood-zone and fire-zone location (hazard variable), and transaction before or after implementation of the law (time variable). By creating an interaction term (that is, multiplying two variables together) between the time and hazard variables (separately for both flood and fire), the coefficients on that term can be interpreted as the effect on price of post-AB 1195 statutory hazard-zone location.²²

We used a two-tier cluster sample method to get a representative sample of housing transactions from across the state. In the first tier, zip codes from across the state were sampled by stratifying all California zip codes by population density, median 1999 housing price, and percentage of land area occupied by flood and fire zones (Appendix A).²³ Zip codes with very low population densities were discarded because they lacked sufficient transactions. One of every nine observations was sampled from each cell, yielding 63 sample zip codes. Figure 3 shows the location of sample zip codes. The method ensured that there would be enough samples in hazard zones (even with this

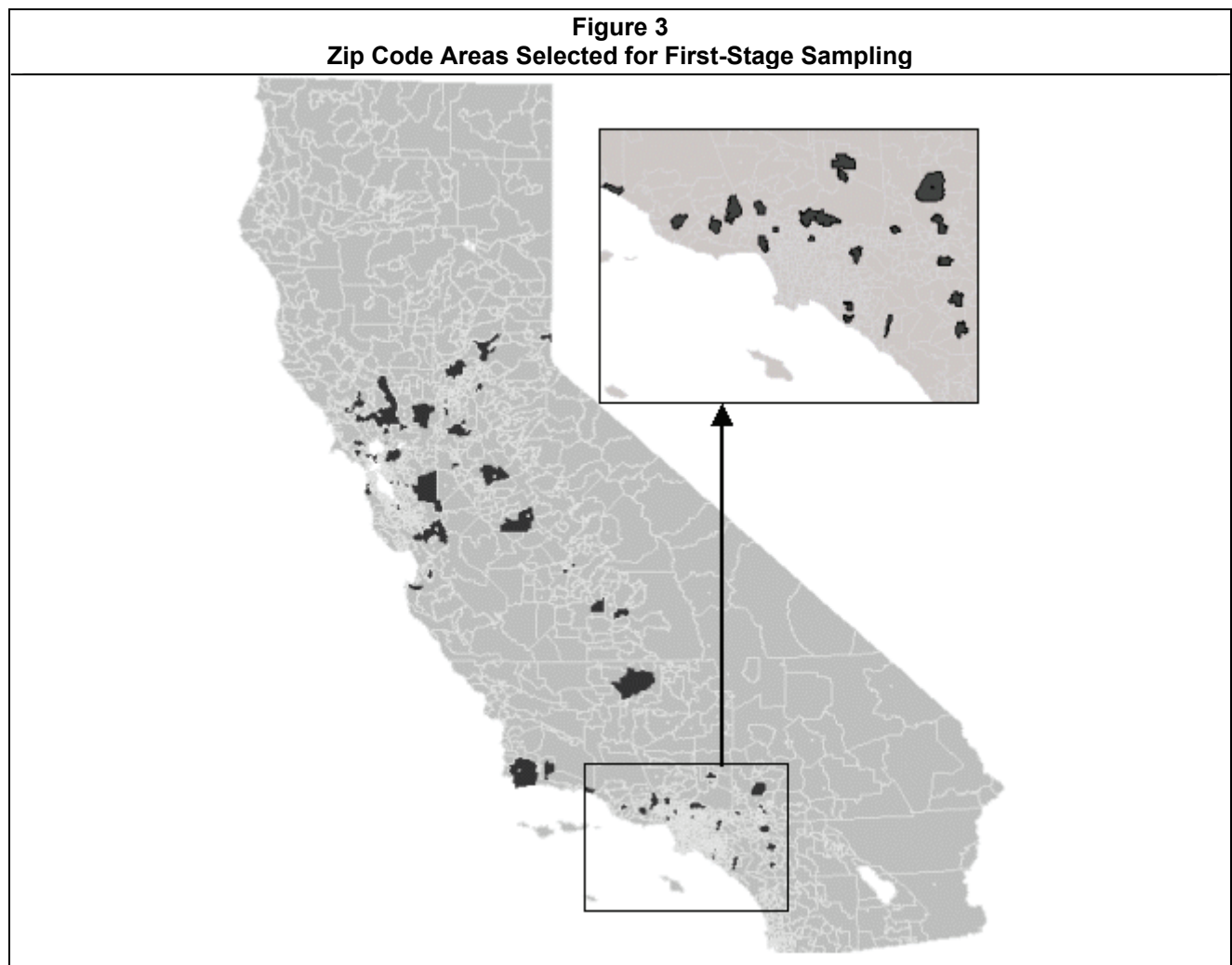
²⁰ For a more detailed discussion of methods, see Troy and Romm (2004).

²¹ Rosen (1974), Quigley and Kain (1970), and Griliches (1971).

²² Two approaches were tried for the hedonic analysis. In the first, data were stratified into groups of transactions from before and after implementation of the law. The coefficients on the floodplain and fire-zone variables could then be translated into dollar terms and interpreted as the hedonic prices for location in one of those zones prior to AB 1195 implementation for the Before group and following AB 1195 implementation for the After group. The change in the magnitude of the hedonic prices theoretically represented the effect of hazard disclosure. The difference in the hedonic prices indicates the effect of disclosure under AB 1195. In a second approach, all data were regressed and dummy variables (a “1” or “0”) were included to represent location in floodplains and fire zones, as well as for transaction before or after the law. The coefficient on interaction terms between a hazard dummy and the dummy for transaction after AB 1195 (FLOOD:AFTER and FIRE:AFTER) could then be interpreted as representing the effect of hazard disclosure. When these interaction terms were included, the coefficient on the hazard terms could be interpreted as representing the effect of hazard location prior to the law. Both approaches were utilized, and the results were found to be consistent.

²³ Three categories of population density and housing price were used. The zip codes were also stratified by four hazard categories: only flood zones present, only fire zones present, both present, and neither present. In this way, all categories were mutually exclusive. The “presence” of a hazard in a zip code was assigned based on whether the percent of hazardous land in the zip code exceeded a given threshold. For floods and urban fire zones, this threshold was 5%, and for wildland fire areas it was 25%. Because of the low number of hazard-zone properties relative to nonhazard-zone properties, zip codes belonging to the nine cells of the “no-hazard” group were dropped, leaving 27 cells in the matrix.

oversampling of hazardous zip codes, only roughly one in five properties was located in a statutory hazard zone) and that a variety of neighborhoods would be included, across the spectrum of housing values and population density.



Once sample zip codes were chosen, individual property transaction records were obtained for the period starting 18 months before the implementation of the law in June of 1998, to 19 months after it. Both vacant- and developed-parcel transactions were obtained, but the vacant-parcel records were separated into a different database for separate regression.²⁴ These property “points” were assigned a geographic location through the process of address geocoding, using Geographic Information Systems software. A variety of control variables were coded for each property point (Table 1).²⁵

²⁴ Property transaction records were downloaded from Metroscan, an online property-transaction database.

²⁵ Demographic data were obtained from the 1990 census and 1995 projections of those data, while market data came from a variety of sources, including the California Association of REALTORS® and the Rand Corporation. Demographic data were at the tract level, while market data were at both the zip code and city level.

The control variables, chosen based on the extensive hedonic literature, can be roughly broken down into property characteristics (e.g., number of bedrooms, house age, square footage, etc.), locational characteristics (e.g., proximity to employment center, amenities, etc.), and neighborhood socioeconomic characteristics (e.g., income, school quality, educational level). Some variables that were expected to be significant based on previous studies, such as presence of pools and fireplaces, were found not to add any explanatory power to the model due to collinearity with other variables (they varied with relation to price in a similar manner with other model variables), and so were excluded. While the control variable set is roughly the same for the fire and flood models (use of control variables was based on significance in the model), there are slight differences (Table 1). This is probably due to the different geography of the two samples.

The key variables were location in FEMA special flood-hazard area zones, State Responsibility Area fire zones, and VHFHSZs.²⁶ No distinction was made between properties in State Responsibility Area zones and VHFHSZs. We obtained GIS data from the CDF showing the perimeters of recent wildfires in order to determine how the effects of disclosure are affected by a neighborhood's recent experience with hazards. The distance of each household point to the nearest fire of greater than 300 acres in the last 10 years before the date of sale was coded using three-month lags so that a house would not be coded with a fire occurring after the time of transaction (BURN5K). Similar data on flood locations were unobtainable at the time.

We began tier-two sampling after all variables were coded.²⁷ Property records were stratified by zip code and by hazard (or nonhazard) zone.²⁸ A sampling algorithm was created that oversampled strata with low populations and undersampled strata with high populations. This served to increase the proportions of hazard-zone properties and properties in zip codes with relatively low numbers of observations. Each stratum was assigned a sampling weight, for use in weighted least-square estimation, equal to the inverse of the sampling rate. The algorithm was designed so that the total number of hazard-zone properties sampled could be set equal to a specified proportion of the total number of non-hazard-zone properties sampled. The tier-two flood sample included 2,840 records in flood zones (about 62% of all flood-zone records) and 14,478 non-flood records (38%), all of which were randomly sampled from the strata and assigned weights. The tier-two fire sample, which was taken out of a smaller population, included 5,779 fire records (76%) and 18,712 nonfire records (45%).

²⁶ Special flood-hazard area data came from the FEMA Q3 digital dataset, and fire-hazard zones were obtained as digital files from the CDF. Location in seismic-hazard areas was also coded, but for inclusion as a control, not a main-effects variable.

²⁷ Tier-two sampling occurred separately for flood and fire properties because flood and fire effects were being estimated separately. To obtain data for the flood regressions, all 63 zip codes were sampled in tier-two sampling. To obtain data for the fire regressions, only 40 zip codes were sampled—those with fire-hazard zones. Flood-hazard zones, on the other hand, are present in almost all zip codes, even including those that did not meet the threshold levels designated for flood-hazard classification under tier-one sampling. Therefore, tier-two sampling was done twice, with overlapping data, but in one case oversampling for properties in fire-hazard zones and in one case oversampling for properties in flood-hazard zones.

²⁸ They were not stratified by transaction after the law because of the extreme complexity of adding a third stratification factor and because roughly 54% of transactions were from after the law's implementation and 46% from before it.

Table 1 Regression Variables			
Variable	Description	Model included in	Count Proportions
Hazard variables			
FLOOD	1 = in the FEMA Class A Flood Zone; 0 = not in that zone	Flood	0.133
FIRE	1 = in a statutory fire-hazard zone; 0 = not in that zone	Fire	0.236
AFTER	1 = transacted after June 1998; 0 = Jan. 1997 to June 1998	Both	0.543
FLOOD:AFTER	1 = Homes in floodplain that transacted after AB 1195 implementation	Flood	0.073
FIRE:AFTER	1 = Homes in fire zone that transacted after AB 1195 implementation	Fire	0.127
BURN5K	1 = a fire of greater than 300 acres has burned within 5 kilometers of the house in the last 10 years; 0 = the previous is not true	Fire	0.35
FIRE:BURN5K:AFTER	1 = a fire of greater than 300 acres has burned within 5 kilometers of the house in the last 10 years AND house transacted in designated fire-hazard disclosure zone after AB 1195 implementation	Fire	0.091
Other variables			
PRICE	Transacted selling price of property	Both	
PHISP	Projected 1997 percentage Hispanic population by tract, based on 1990 census	Both	-
ASSDSTCT	Assessed value of structure, normalized by mean	Both	-
BATH	Number of bathrooms	Flood	-
BED	Number of bedrooms	Both	-
TOTALRMS	Total number of rooms	Fire	
SIZE	Total structure square meters	Both	-
LOT	Lot size, hectares	Both	-
NEW	1 = house less than 10 years old	Flood	-
OLD	1 = house older than 75 years	Flood	-
D2STAR	Distance (km) to nearest Starbucks™ coffee shop	Both	-
AVG. RANK	Ranking of district schools by statewide 1-10 standard, normalized by mean	Both	-
AGE	Projected 1997 median age by tract	Fire	-
PUNEMP	Projected 1997 percentage unemployment by tract	Both	-
MHHINC	Projected 1997 median household income by tract, normalized by mean	Both	-
CBDIND2	Logged Central Business District Index**	Both	-
D2HIWAY	Distance (km) to nearest highway or major arterial road	Both	-
SDIND1	Number of transactions by zip code over the population by year	Both	-
PRRATIO	Ratio of median zip code price to median state price	Fire	-
PADJ	Percentage change in median home price by quarter relative to first-quarter price, at zip code level	Both	-
NRCOAST	1 = Within 1 km of coast	Flood	-
COAST5K	1 = Between 1 and 5 km of coast	Flood	-
COAST15K	1 = Between 10 and 15 km of coast	Flood	-

Quadratic terms used for flood model: SIZE, BED, BATH, D2HIWAY, D2STAR Quadratic terms used for fire model: SIZE, LOT, BED, D2HIWAY TOTAL SAMPLES: 21,693 for flood model, 24,538 for fire model

*Non-normalized means of normalized variables are given in parentheses.

**The Central Business District Index was derived by dividing up the business districts within commuting distance of the sample zip codes into A, B, and C districts, based on density of employment and amount of revenue produced by companies in those districts, with A districts representing the highest density relative to revenue. $CBDIND2 = \log(Ra/Da + Rb/Db + Rc/Dc)$, where Ra = revenue of nearest A district and Da = distance to the nearest A district, Rb = revenue of nearest B district, etc.

Weighted least-squares regressions²⁹ were run on the data using a semi-log functional form.³⁰ One property of this functional form is ease of interpretation; coefficients can be interpreted as percentage changes in the response due to a marginal increase in an attribute. Both weighted and unweighted least-squares regressions were run, and results were found to be robust to inclusion or exclusion of weights. Only weighted results are given here.

We used five regression models (Table 2). In Model 1 we regressed the samples from the flood dataset without demographic interaction terms, but included an interaction term for AB 1195 disclosure (FLOOD:AFTER). In Model 2 we looked at the effects of flood-zone location and disclosure accounting for interaction with median household income. In addition to FLOOD and FLOOD:AFTER, it included interaction between median household income and pre-AB 1195 flood-zone location (FLOOD:MHHINC) as well as an additive interaction effect for post-AB 1195 flood-zone location (FLOOD:AFTER:MHHINC). (We eliminated the latter term from the model because it was not significant at the 90% confidence level.³¹) In Model 3 we examined the effects of flood-zone location and disclosure accounting for interaction with the percentage of Hispanics by census tract. In addition to FLOOD and FLOOD:AFTER, this model included interaction between percent Hispanic and pre-AB 1195 flood-zone location (FLOOD:PHISP), as well as an additive interaction effect for percent Hispanic and post-AB 1195 flood-zone location (FLOOD:AFTER:PHISP). (We eliminated FLOOD:AFTER and FLOOD:PHISP from this model because they were not significant at the 90% confidence level.) In Model 4 we regressed samples from the fire dataset including a term representing fire disclosure (FIRE:AFTER), while in Model 5 these data were regressed also including an interaction term representing recent experience with nearby fire for homes sold in statutory fire-hazard zones following AB 1195 (FIRE:BURN5K:AFTER). Because demographic and socioeconomic variables did not interact significantly with the fire-disclosure term for the fire dataset, no such interaction terms were included for the fire-hazard models.³² R-squared values for models ranged between .75 and .77, and all variables had expected sign and significance. The regression results are given in Appendix B.

²⁹ Weighted least-squares regression is a form of least-squares regression in which individual observations are given different weights. In this particular case, weights were used to address our use of unequal sampling probabilities, or disproportionate sampling, in tier-two sampling.

³⁰ The semi-log functional was determined to be appropriate through use of a Box-Cox transformation as well as through plotting of the residuals.

³¹ Inclusion of too many insignificant terms with the FLOOD variable made the parameter estimates on the significant ones somewhat unstable, due to the finite number of observations in the flood zone, and hence they were dropped.

³² Fire-hazard location (independent of AB 1195) did interact significantly with income; however, that result is not given here since it detracts from the main focus of this paper, which is the effects of AB 1195.

Table 2 Regression Models		
Model	Data Sample	Interaction terms
1	Flood	No interaction terms except for overall disclosure effect (FLOOD:AFTER)
2	Flood	Disclosure effect (FLOOD:AFTER) and interaction between income and flood location (FLOOD:MHHINC). Interaction between median household income and disclosure pursuant to AB 1195 (FLOOD:MHHINC:AFTER) was insignificant at the 90% level and therefore excluded from the model.
3	Flood	Disclosure effect (FLOOD:AFTER); interaction between percent Hispanic and flood location (FLOOD:PHISP) and interaction between percent Hispanic and flood disclosure (FLOOD:PHISP:AFTER). FLOOD:AFTER was excluded because not significant at the 10% confidence level.
4	Fire	No interaction except FIRE:AFTER
5	Fire	Interaction for recent experience and disclosure (FIRE:AFTER:BURN5K); FIRE:AFTER excluded due to insignificance

MAIL SURVEYS

In addition to the hedonic analysis, mail surveys were sent out as a means of getting a preliminary understanding of the extent of disclosure and homeowner attitudes toward it. Surveys were sent to 1,200 households in designated hazard zones that had been sold since June 1998 within the 63 sample zip codes. The surveys were designed to determine (1) if the law is being complied with, and when disclosure is happening in the home-buying process; (2) how important this knowledge is to homebuyers, whether it gave them second thoughts about buying, and whether it made them bid less on the property; (3) whether disclosure is encouraging homeowners to take more precautionary measures than they otherwise would have taken, including buying insurance, floodproofing, and cutting back vegetation; and (4) how important people would consider hazard location to be in some hypothetical future house purchase. Of 1,200 surveys sent out, 197 were returned that were complete, for a response rate of 16.4%. While the low number of complete responses reduces the statistical significance of any results and introduces a potential selection bias, they still yielded information that was useful enough to include (Appendix C).

EFFECTS OF FLOOD-ZONE DISCLOSURE ON HOUSING PRICES³³

Disclosure under AB 1195 has reduced the value of the average home in a statutory flood zone relative to a comparable home that is not in such a zone. Holding other attributes constant, our results indicate that before AB 1195 floodplain properties were worth roughly the same as comparable non-hazard-zone houses. After AB 1195, floodplain properties were worth 4.1% less than comparable non-floodplain properties. Thus, AB 1195 results in a loss in value of \$7,998 for the average floodplain home (Table 3).

Table 3 Price Differentials Between Comparable Flood-Zone and Non-Flood-Zone Properties Before and After AB 1195 (Model 1)			
Time	Zone	Price	Floodplain Differential—Before
Before	Flood	\$185,779	None
Before	Non-Flood	\$185,779	
			Floodplain Differential—After
After	Flood	\$185,455	(\$7,998)
After	Non-Flood	\$193,453	
Reduction in differentials due to AB 1195:			(\$7,998)
Note: Parentheses = negative values.			

The effects of flood-zone disclosure are strongly conditioned by the racial/ethnic composition of a neighborhood. Inclusion of an interaction term between flood-zone disclosure and a variable representing the percentage of Hispanics in a tract indicates that the decline in property value flood-zone disclosure is mainly accounted for by neighborhoods with a higher-than-average proportion of Hispanic residents. Before AB 1195, there is no statistically significant interaction between flood-zone location and the percentage of Hispanics (FLOOD:PHISP). However, after AB 1195, there is a significant interaction (FLOOD:PHISP:AFTER). Following implementation of AB 1195, for each 10% increase in Hispanic population there is a 1.2% reduction in the price of a floodplain home relative to a comparable non-floodplain home. Hence, holding all else constant (including overall price appreciation), after AB 1195 a floodplain home in a neighborhood that was 50% Hispanic sold for roughly 6% less than a comparable non-floodplain home. Before AB 1195, the two would have sold for the same amount.

When plugged into the regression equation for the mean percentage of Hispanics (19%) and mean income (values were normalized by the mean, so 1 was used), disclosure results in a \$4,275 drop in value for the average floodplain home (Table 4). However, Table 5 shows how this reduction gets significantly larger as the percentage of Hispanics per tract increases. A home in a tract whose population was 50% Hispanic saw a reduction in value in excess of \$12,300 due to disclosure. When this interaction term is included, the coefficient on the term for flood-zone disclosure (FLOOD:AFTER) became insignificant, indicating that most of the negative price effects of flood disclosure are accounted for by communities with relatively high percentages of Hispanic residents.

³³ For a more detailed elaboration of results, see Troy and Romm (2004).

Table 4 Mean Price Differentials Before and After AB 1195 Between Comparable Flood-Zone and Non-Flood-Zone Properties, Controlling for the Interaction Between Percent Hispanic and Flood-Zone Disclosure (Model 3)			
Time	Zone	Price	Floodplain Differential-Before
Before	Flood	\$185,964	None
Before	Non-Flood	\$185,964	
			Floodplain Differential-After
After	Flood	\$189,282	(\$4,275)
After	Non-Flood	\$193,557	
Reduction in differentials due to AB 1195:			(\$4,275)
Note: Parentheses = negative values.			

Table 5 Changes in Price Reduction Due to Disclosure as a Function of Percent Hispanic by Tract									
Percent Hispanic by Tract	1%	5%	10%	19%	25%	30%	40%	50%	60%
Reduction in property value	(\$213)	(\$1,080)	(\$2,191)	(\$4,275)	(\$5,725)	(\$6,972)	(\$9,573)	(\$12,324)	(\$15,230)
Note: Parentheses = negative values.									

Median household income (MHHINC) was also tested for interaction with both flood-zone location (FLOOD: MHHINC) and AB 1195 disclosure (FLOOD:MHHINC:AFTER). Income did interact positively and significantly with flood-zone location. The positive coefficient indicates that floodplain properties in low-income neighborhoods are worth less than comparable non-floodplain properties (independent of transaction before or after AB 1195), while in high-income neighborhoods it is the opposite.³⁴ When the interaction effect between income and flood location is included (Model 2), the magnitude of the price reduction due to disclosure (FLOOD:AFTER) is increased to \$6,905 for the mean income level (Table 6).³⁵ This indicates that poorer communities see more of a negative price effect due to flood location, but AB 1195 had no effect on this.

While income does interact with flood-zone location, it does not interact substantially with flood disclosure. That is, the price-effect relationship between flood-zone location and income is little different before implementation of the law than after (FLOOD:AFTER:MHHINC is not significant). Whatever mechanism confines the negative floodplain price premium to poor areas does not change after the law's implementation. Instead of income, it is the percentage of Hispanics in a neighborhoods that most strongly conditions the price effects of flood-zone disclosure.

³⁴ This counter-intuitive result may be because of strong amenity values (e.g., river or canyon views) associated with floodplains located in wealthier areas.

³⁵ The magnitude of FLOOD:AFTER is slightly reduced in this model, while FLOOD becomes highly significant and negative and the interaction term FLOOD:MHHINC becomes highly significant and positive.

Table 6 Price Differentials Between Comparable Flood-Zone and Non-Flood-Zone Properties, Controlling for the Interaction Between Median Household Income and Flood Location (Model 2)			
Time	Zone	Price	Floodplain Differential-Before
Before	Flood	\$193,938	\$8,060
Before	Non-Flood	\$185,878	
			Floodplain Differential-After
After	Flood	\$194,431	(\$1,155)
After	Non-Flood	\$193,276	
Reduction in Differentials Due to AB 1195:			(\$6,905)
Note: Parentheses = negative values.			

EFFECTS OF FIRE-ZONE DISCLOSURE ON HOUSING PRICES

Model 4 (see Appendix Table B-2 for summary results of Models 4 and 5) indicates a positive premium of 3% for fire-zone location prior to AB 1195, which does not change after the law's implementation (FIRE:AFTER is not significant). These results suggest the omission of variables that might account for the high levels of demand for housing in the urban-wildland fringe areas where fire hazards are found. Because that variable or variables are not included in our analysis, that positive variance in price has been accounted for by the FIRE variable. Based on these results, it appears that wildfire-zone disclosure had no effect for the overall population of fire-zone houses.

Model 5 results indicate that the combination of proximity to a recent fire and disclosure negatively affects housing prices. A house selling in a statutory fire-hazard zone after the law's implementation that was also within 5 km of a major (greater than 300 acres) and recent (last 10 years) fire sold for 5.1% less than a comparable fire-zone home selling after the law's implementation that was not within 5 km of a recent fire.³⁶ When this effect is controlled for (FIRE:AFTER:BURN5K), the effect of wildfire-zone disclosure (FIRE:AFTER) actually becomes positive and significant, but at the same magnitude as FIRE:AFTER:BURN5K. In other words, prices actually went up in fire-hazard zones after the law's implementation except in locations near a recent fire. After implementation, a home in a statutory fire zone near the site of a recent fire sold for than \$10,600 less than a comparable home in a statutory fire zone in which no fire had recently occurred. Adding an income interaction term in Model 6 indicates that income interacts negatively with wildfire-zone location but not with wildfire-zone disclosure (FIRE:MHHINC is significant, but FIRE:MHHINC:AFTER is not). That is, homes in wealthier areas are the only ones that see a negative price effect from wildfire-zone location (starting at 150% of median household income), but disclosure does not change that negative price effect.

Although the fact that the wildfire-zone disclosure term (FIRE:AFTER) had a positive coefficient might suggest at first glance that disclosure caused no decline in price, the negative price effect in fire-disclosure zones near a recent fire is an indication that disclosure is having an effect at least in certain areas. Prices in fire zones went up after AB 1195 not because of fire disclosure, but because of increases in demand for urban fringe properties not captured in the control variables of the model (its variance was assumed under the wildfire-zone term). If that effect could have been controlled for, we likely would have seen a decrease in purchase price due to wildfire-zone disclosure and the decline would likely have been greater in fire-hazard zones near the site of a recent fire.

The availability and/or cost of fire insurance may help explain the results of Model 5. Before disclosure was mandated, many potential homebuyers in these areas may not have realized that their prospective home was in a wildfire zone and that they would either have difficulty getting adequate insurance coverage or would need to pay more for that coverage. After the law was implemented, people were probably more aware that they lived in such a zone and potential buyers were probably

³⁶ However, all fire-zone homes, even those near the site of a recent fire, sold for more, on average, than comparable non-fire-zone homes, even after AB 1195's implementation. The results mean that fire-zone homes near the site of a recent fire are worth considerably (5%) less than they would have been had they not been near the site of a recent fire. After the law was implemented, fire-zone homes near recent fires were only worth 3% more than comparable non-fire-zone homes, while fire zone homes not near recent fires were worth 8% more.

more concerned about the availability and affordability of insurance.³⁷ Disclosure served as a cue to homebuyers to do more research about the availability and pricing of insurance. In areas where a recent fire had occurred, there was a good probability that insurance would have been either unavailable through the private markets, very expensive, or inadequate, any of which would have lowered the selling price. This is discussed further under “Policy Implications and Recommendations.”

³⁷ California coordinates the FAIR (Fair Access to Insurance Requirements) Plan, described further under “Policy Implications and Recommendations,” which offers fire insurance to homeowners who were unable to obtain it through the private markets. Rates are subsidized, but still high. Additionally, until June of 2001 (and hence for the time of this study) FAIR Plan insurance was available only in a few select areas in Southern California. Most of the fire-hazard properties in this study were not located in FAIR Plan zones, and so it is likely that many property owners in these areas were unable to get fire insurance or could only get it at extremely high rates.

RACE/ETHNICITY AND HAZARD

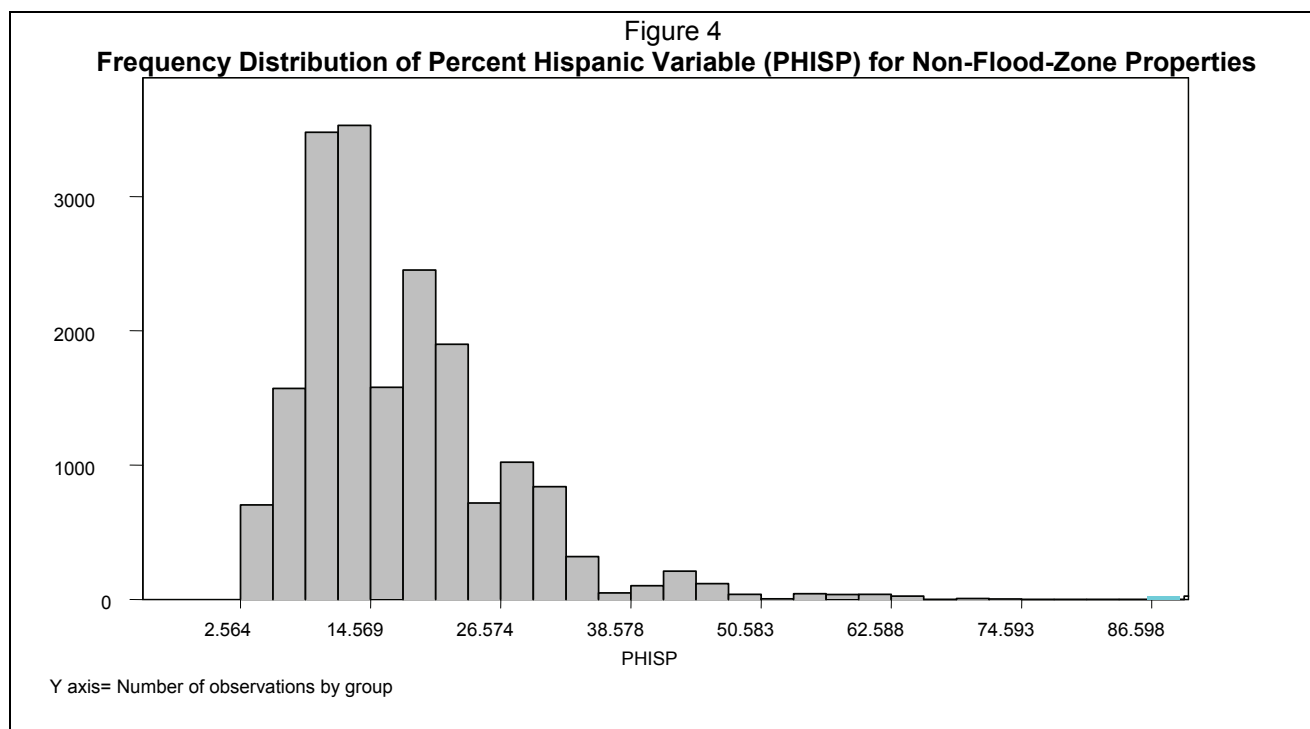
AB 1195 appears to have caused floodplain homes in largely Hispanic neighborhoods to be worth less than they otherwise would be, while having relatively little effect on floodplain properties in neighborhoods where the percentage of Hispanics is low. We offer two possible, mutually compatible explanations for this result. The first contends that AB 1195 is correcting discrepancies in disclosure between racial or ethnic groups that existed under the NFIP. These discrepancies existed because disclosure was regulated through the mortgage process, and because minorities are more likely to originate their mortgage through subprime lenders who, at the time of this study, were not subject to NFIP disclosure rules. The price effects caused by AB 1195 are seen only in Hispanic communities because, of all minority groups, Hispanics have by far the greatest presence in floodplains. The second contends that the Hispanic variable may not just be measuring the percentage of Hispanics in a neighborhood, but may be correlated with some unmeasured factor with which the real interaction is occurring, such as housing demand.

FIRST POTENTIAL EXPLANATION: A MORTGAGE-ORIGINATION EFFECT

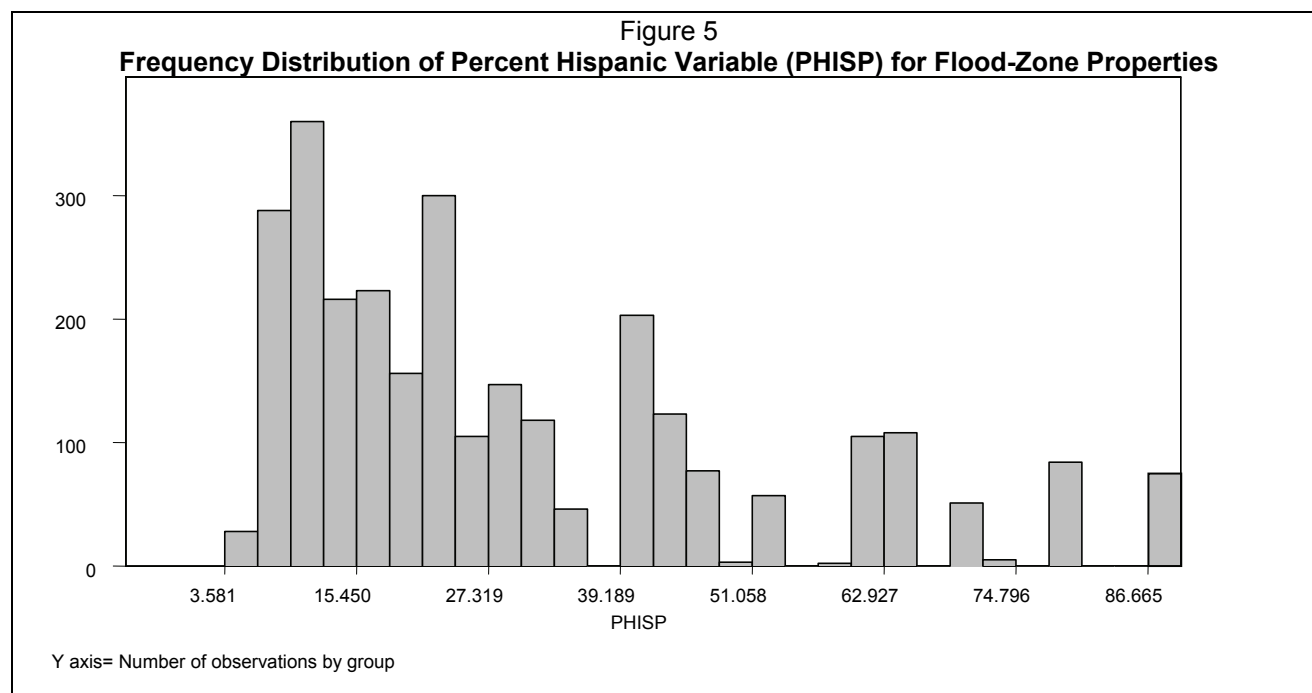
The first possibility, that flood disclosure was occurring less often in Hispanic neighborhoods than in other neighborhoods prior to AB 1195, would arise from biases in the previously existing flood-disclosure mechanism under the NFIP. AB 1195 would then disproportionately affect Hispanic neighborhoods by correcting this discrepancy in disclosure. However, if AB 1195 was correcting information discrepancies caused by the NFIP, that would suggest that the price of floodplain homes in mostly non-Hispanic white neighborhoods should also have been lower than that of comparable non-floodplain homes prior to AB 1195. But our results did not indicate that (i.e., the FLOOD variable is insignificant in models 1 and 3).³⁸ Instead, the results suggest that no one received disclosure prior to AB 1195, and that after the law's implementation only Hispanics received disclosure, a result that does not follow logically.

We suggest, rather, that disclosure was actually occurring in largely non-Hispanic white neighborhoods prior to AB 1195 and that the lack of a statistically significant effect in the time period was the result of two things. First, Hispanics have a large presence within floodplains, relative to both other minority groups and non-Hispanic whites. If, prior to AB 1195, there was no floodplain differential for Hispanic neighborhoods, that effect might have been so great as to counteract the negative effect from existing price differentials in predominantly non-Hispanic white neighborhoods, for which there were fewer floodplain observations. Figures 4 and 5 show that the distributions for the percent Hispanic variable are skewed to the left for the non-flood-zone group, but considerably less so for the flood-zone group, suggesting that the sample populations of flood-zone properties are disproportionately in Hispanic neighborhoods. Moreover, the average non-flood-zone property in the dataset belongs to a census tract that is 17.5% Hispanic, while the average flood-zone property belongs to a tract that is 31% Hispanic.

³⁸ While Model 2 does yield a positive and highly negative coefficient for FLOOD, it should be noted that FLOOD:MHHINC is positive and has greater magnitude (MHHINC has a mean value of 1, so the two are comparable), effectively canceling out the effect of FLOOD.



Second, there might have been an unmeasured positive amenity value associated with location in certain types of floodplains that cancelled out the negative effect of pre-AB 1195 floodplain location. It is a strong possibility that the aesthetic beauty of living in a canyon bottom, on a riverside, or by a dry creek bed positively affected prices. The amenity value (stemming only from relatively few records) would have been strong enough and the floodplain premium weak enough that the two cancelled each other out. In other words, there must have been an unmeasured negative premium before the law was in effect, but it was small enough that it was statistically masked by the unmeasured positive amenity value. If either (or both) of these is the case, then the results of this study are consistent with the hypothesis that AB 1195 is correcting discrepancies in disclosure. Under this scenario, before AB 1195, properties in floodplain neighborhoods that were made up largely of non-Hispanic whites did register a lower price, but that effect was offset by the omitted aesthetic effect and by the extremely large number of floodplain observations in Hispanic neighborhoods. AB 1195 increased disclosure and reduced prices slightly in these more lightly Hispanic-populated neighborhoods, as Table 5 shows, but the fact that it reduced prices significantly in more highly Hispanic-populated neighborhoods suggests that it did correct a disclosure discrepancy.



What were the mechanisms behind this disclosure discrepancy under NFIP, and what did AB 1195 do to correct them? Hispanic homebuyers disproportionately obtain financing from less stringently regulated sectors of the mortgage industry, including “subprime” mortgage companies (see “Previous Hazard Disclosure Requirements” section above for description).³⁹ At the time of this study, FEMA required federally regulated lenders (banks, S&Ls, credit unions, etc.) to make flood-hazard determinations. Mortgage companies’ disclosure requirements are more nebulous, and they are subject to less stringent regulatory oversight than are commercial banks and S&Ls. Hence, many mortgage companies make flood designations only when they sell investment-grade mortgage portfolios to government-sponsored enterprises, such as FNMA or FHMC, or to federally regulated banks, all of which require a federally compliant mortgage contract. Subprime mortgage companies in particular are likely to not disclose because they traditionally have not resold their loans to an institution requiring the federally compliant mortgage contract. Because of the higher risk involved, government-sponsored enterprises and large commercial banks generally do not purchase them, and hence these companies have been subject to very little regulatory oversight.⁴⁰ Moreover, such lenders are notorious for pressuring homebuyers into the terms of the loan without adequately explaining them. Hence, given the apparent lack of oversight in this sector, it would not be surprising if these institutions were lax in requiring designations and disclosure of flood hazard.

Our data indicate that Hispanic homebuyers are far more likely than non-Hispanic whites to originate their mortgage with a subprime lender. In sampling eight Metropolitan Statistical Areas in California, we found that Hispanics were nearly twice as likely as non-Hispanic whites to originate

³⁹ Authors’ analysis of the Federal Financial Institutions Examination Council’s (FFIEC) Home Mortgage Disclosure Act data; and subprime mortgage-origination data from the Department of Housing and Urban Development (HUD).

⁴⁰ See, for example, Temkin et al. (2002) and Canner and Passmore (1999).

their mortgage with a subprime lender (Table 7).⁴¹ These results are consistent with a recent study that found a great disparity between the rates at which Hispanic and non-Hispanic whites resorted to subprime borrowing. The study also found that some of the Metropolitan Statistical Areas of highest disparity in the nation were in California, including Fresno (included in this study), which was in the top three for the nation.⁴²

Table 7
**Percentage of Subprime Mortgages Originated
in Selected California Metropolitan Areas for 1998, by Ethnicity**

			Bakers-field	Fresno	Modesto-Merced	Sacramento*	Solano County	Salinas	Santa Cruz-Watsonville	Santa Barbara	TOTAL
Mortgage Originations by Ethnicity	Hispanic	% subprime	24%	28%	27%	12%	18%	33%	27%	17%	25%
		# subprime	1944	3103	1945	430	417	1720	487	584	10630
		Total #	8161	11097	7281	3664	2372	5210	1833	3396	43014
	Non-Hispanic White	% subprime	20%	17%	20%	7%	12%	15%	13%	9%	14%
		# subprime	4311	4126	4134	2558	1913	1974	2359	1699	23074
		Total #	21043	24071	20718	35109	16251	13140	17593	18001	164814

*Partial sample of mortgage originations for Metropolitan Statistical Areas.

The combination of Hispanics not receiving disclosure prior to AB 1195 and their large share of the population in floodplains may help explain why AB 1195 appears to have reduced overall prices in floodplains in Model 1. Other minority groups that finance with subprime lenders do not appear to be affected by AB 1195 because their population shares within the floodplains we sampled are so small.⁴³ Hence, Hispanics are the only group that are both heavily located in floodplains and disproportionately finance their homes through less-regulated sources.

SECOND POTENTIAL EXPLANATION: A PROXY-VARIABLE EFFECT

An alternate hypothesis that is not mutually exclusive with the mortgage-origination theory is that the PHISP variable may act as a proxy for some other important quality that is not included in the model. For example, PHISP may be inversely correlated with housing demand or rates of change in demand in the areas sampled. Many of the highly Hispanic neighborhoods sampled in this study are very low-demand housing markets. It may be that communities of poor, immigrant Hispanics are living in low-demand, flood-prone areas because other, less marginalized communities do not wish

⁴¹ Authors' analysis of a list of subprime lenders from HUD, in conjunction with the FFIEC's Home Mortgage Disclosure Act (HMDA) database from 1998.

⁴² Bradford (2002).

⁴³ A variable for the percent of African Americans was initially included in the models but had no interaction with the flood term. It was dropped because of colinearity problems.

to live there. It may also be that some of these neighborhoods had experienced bad floods, encroaching urban problems, or both. Perhaps, as non-Hispanic white middle-class households left these neighborhoods, demand and prices went down, and poorer, possibly migrant Hispanic households moved into these now more affordable neighborhoods. If most of the Hispanic neighborhoods included here are low-demand areas, then lacking any other variable for supply-demand balance (a notoriously difficult variable to quantify), the Hispanic variable may be explaining that variance; in areas of high demand, residents are willing to accept and overlook the flood problem in order to get the house they want, while in low-demand areas, prospective buyers will adjust for the location by bidding less.

The Hispanic variable may also act as a proxy for housing quality, another attribute for which no data were available. Hispanics, especially recent immigrants, tend to get lower-quality housing for a given amount of money relative to non-Hispanic whites because of factors, including real-estate steering practices and language barriers, that give sellers a distinct advantage over Hispanic buyers.⁴⁴ Hispanic immigrant households frequently choose to cluster densely in the same neighborhood, which also makes Hispanic buyers willing to pay more for what is often substandard housing and gives non-Hispanic sellers another advantage. If this is the case in general, then the Hispanic variable may actually be a proxy for housing quality, since price in these neighborhoods does not adequately reflect quality. In this case, the negative interaction between flood-zone disclosure and Hispanic population indicates that the effects of disclosure can be seen particularly on low-quality houses; it may be that such houses are more expensive to adequately insure, perhaps because they tend to endure more damage in the event of flooding.

⁴⁴ See, for example, Milgram (1988), Krivo (1995), and Ondrich (1998).

BUYERS' PERCEPTIONS OF HAZARD DISCLOSURE

Not enough mail surveys were returned (197 of 1200) to yield statistically significant results about hazard disclosure at the state level. Nonetheless, at the minimum these results anecdotally suggest some trends. First, a large majority (75%) of respondents remember seeing the hazard-disclosure form. Second, the disclosure form is being seen at a variety of points in the transaction process, but usually long after the open house (or at least according to buyers' memories). This is an important point, because if the form were seen earlier in the home-buying process, it would likely affect home prices more because prospective homebuyers would have a greater opportunity to adjust their bids. Though most respondents said that the form did not lead them to bid less on the house, enough did to have, if representative, a significant effect on housing prices in hazard zones statewide. Most people consider location in a hazard zone an important concern, and nearly half said it gave them at least a few second thoughts in buying their property. It also appears that of the three hazard-zone types, flood elicits the most concern.

Respondents seemed more concerned about avoiding hazardous properties when asked about a hypothetical future home purchase than in regard to their current home, with more than a third considering such avoidance "very important." This raises the question of how hazard perception is psychologically constructed. If homebuyers are not concerned about hazards in their immediate decisions, but are about some future hypothetical hazard, this may indicate that avoiding environmental risk is an abstract concern, separate from the practicalities of home-buying. Only when practical ramifications, like mandatory insurance or floodproofing costs, are added in do homebuyers express these concerns as factors of consideration in the housing bid.

The survey also indicated that homebuyers are incurring many expenses associated with natural hazards, from mandatory insurance purchase, to vegetative clearance, to seismic retrofitting. One result of interest was that more people claimed they are buying flood insurance than claimed to be living in an SFHA flood zone. This suggests that the vast majority of those who received flood-hazard disclosure are buying the required flood insurance mentioned on the NHD form. Based on this result, it is likely that the lowered purchase price associated with flood disclosure is a reflection of at least the discounted stream of future insurance payments.⁴⁵

⁴⁵ Verifying how much of the negative premium in flood zones is a reflection of added insurance costs and how much is an option price (risk-aversion premium) is difficult for two reasons. First, homeowners pay different rates depending on various factors, and the dataset includes a very wide variety of homes in terms of value and structure type. Plus, important rate-determining factors, such structural elevation of the building above floodplain level and basement type, are missing from the dataset. Second, this study is simply showing the additional negative premium due to disclosure under AB 1195. Determining the extent to which insurance premiums are factored into the buyer's purchase price and whether an option price exists would require isolating the negative premium due to all flood disclosure (before and after AB 1195). Without information on the extent of flood disclosure before AB 1195, this is hard to answer.

EXPLAINING DISPARATE POST-AB 1195 PRICE BEHAVIORS: FLOOD VS. FIRE

Before AB 1195 there appeared to be no significant difference in price between comparable floodplain and non-floodplain properties, while a negative differential developed for floodplain properties following AB 1195's implementation. This indicates that the costs and risks associated with floodplain location are better internalized under AB 1195 than under the National Flood Insurance Program, which was the only policy governing disclosure previously. While the amount of the negative floodplain premium under AB 1195 varies from \$4,275 to \$7,998 (depending on the interaction model used), the absence of a decline in price in flood-hazard zones prior to implementation of AB 1195 (that is, under the NFIP) is at odds with many hedonic studies on the price effects of real-estate location in floodplains which have found considerable negative price effects from floodplain location under the NFIP.⁴⁶ However, almost all these studies were done in the Southeast or Midwest.

Our results, which represent one of the first such studies in the West, suggest that the different nature of hydrology and climate (i.e., intermittent watercourses, seasonal precipitation patterns, and less-perceptible flood threats) may result in lessened consumer sensitivity to flood risk that the NFIP's disclosure mechanisms may be inadequate to address.⁴⁷ Our study is consistent with one of the only other studies⁴⁸ to look at the NFIP in the West (in that case, Colorado), which found that the NFIP was inadequate in its dissemination of information. Using homeowner surveys in Boulder, Colorado, this study found that homebuyers in the floodplain typically learned of the flood risk very late in the buying process and generally underestimated the costs of flood insurance and that 70% of those homebuyers would have bid less on the property had they known. It seems unlikely that information on flooding would be so poorly disseminated in the more humid East, South, and Midwest of the country, where the presence of large perennial rivers serves as a strong indicator that flood hazard is a possibility.

When we looked at how price effects vary with population characteristics, it became evident that communities with relatively high percentages of Hispanic residents account for most of the price decrease effect. Tracts with low Hispanic populations (<5%) show a very minor price effect, while that effect grows to -\$15,230 for a tract with 60% Hispanic population. In other words, AB 1195 appears to have caused floodplain homes in highly Hispanic neighborhoods to be worth less than they otherwise would be, while having relatively little effect on floodplain properties in neighborhoods where the percentage of Hispanics is low.

The fact that the population share of Hispanics in floodplains is so high means that the price effects of flood-zone disclosure under AB 1195 are extensive and significant. Under AB 1195, property prices should better reflect the costs and risks associated with living in a flood zone. While this reduction in price may not sound like an equity-promoting mechanism, it is. The results suggest that

⁴⁶ See, for example, MacDonald et al. (1990), Shilling et al. (1985, 1989), Donnelly (1989), Harrison et al. (2001), and Frigden and Schultz (1999).

⁴⁷ Muckleston (1983) was one of the only western studies, taking place in Oregon, and its results were also at odds with the other studies.

⁴⁸ Chivers and Flores (2003).

before the law took effect, many Hispanics were bidding too much on homes because they did not have complete information on the true costs and risks of living in that location—particularly the fact that flood insurance would be a necessary purchase. Bidding too high based on lack of information and then paying for flood insurance and other expenses is like paying for the same thing twice. It is likely that many learned only after the transaction that they were in a floodplain and had to purchase flood insurance. While lower prices in floodplains after AB 1195 took effect may be inequitable to those who bought under pre-AB 1195 conditions of asymmetric access to information, they are good for all future floodplain homebuyers using subprime lenders, because the prices they pay reflect the added costs and risks of floodplain living.

As for the effect of income in conditioning price differentials due to flood hazard, we found that flood-zone homes were worth less than comparable non-flood-zone homes in low-income neighborhoods, while in wealthy areas flood-zone homes were worth more than comparable non-flood-zone homes. The latter result is likely due to the fact that in wealthy areas, flood-zone location is associated with some unmeasured positive aesthetic amenity, like riverfront views or location in a canyon. However, the effect of income is no different after AB 1195 took effect, indicating that disclosure's effect on housing prices is independent of income.

Unlike flood-hazard disclosure, our model shows that fire-hazard disclosure by itself has had no negative effect on prices in general. On the contrary, location in fire zones appears to be associated with an increase in sales price. This is probably because the urban-wildland fringe areas in which these statutory zones are found are among the most desirable places to live, both because of their proximity to natural amenities and because of their distance from the problems associated with urban cores. Lacking a variable to properly control for the “desirability” of these neighborhoods, our model detects that price goes up in these areas. Prices may actually have gone down in response to fire-hazard disclosure but, if so, our model is unable to quantify this effect. However, our model does detect that prices are reduced when fire disclosure occurs for a property near the site of a recent fire.⁴⁹ That is, a home selling after implementation of AB 1195 in a statutory fire-hazard zone that is also within 5 km of a recent major fire is worth less than a comparable home in a statutory fire-hazard zone that was not near the site of a major fire. However, since all fire-zone properties are worth more than comparable non-fire-zone properties on average, this actually means that the positive premium associated with fire-zone location is less for those properties near a recent fire. This result suggests that in the case of fire hazard, it is proximity to the site of a recent fire *in combination with disclosure* that has the greatest effect on consumer behavior.

⁴⁹ The same thing could not be verified for floods because reliable records of flooding were not available.

POLICY IMPLICATIONS AND RECOMMENDATIONS

FLOOD-ZONE HAZARDS

This study demonstrates AB 1195's success in addressing the problem of imperfect information in property transactions in flood zones. Across the state, hazard disclosure is now happening with more frequency and with more effectiveness than before AB 1195, although the level of success is greater in flood zones than in fire zones. A possible reason for the success of this law relative to previous disclosure requirements is that AB 1195 relies upon strong incentives, particularly the transfer of liability from sellers and agents to third parties. Given the importance of housing transactions in the economy, and the gravity of potential liability, it is not surprising that this mechanism for encouraging disclosure would work well. This incentive approach to disclosure could serve as a useful template for other states wishing to enact similar legislation.

This study also shows the shortcomings of existing federal policy in addressing the issue of hazard disclosure. By demonstrating the extent to which AB 1195 affected property values, our study suggests that disclosure of flood hazard in California was inadequate under FEMA's National Flood Insurance Program. If, as many federal policymakers claim, disclosure under the NFIP is adequate, then there should have been no effect from AB 1195 in flood zones. The fact that there was a negative price effect, and that it selectively occurred in Hispanic areas, is not only an indication that California's approach is more effective than the federal one, but also that there are biases in the NFIP's disclosure and designation mechanisms that leave Hispanic homebuyers in California, on average, with less information. The most likely reason that AB 1195 diminished disparities in disclosure rates between Hispanics and non-Hispanics is related to the fact that disclosure under the NFIP was triggered through the mortgage-origination process. This study found differences in methods of home financing among Hispanics—namely, higher rates of origination from subprime lenders—that might, in combination with their high rates of occupancy in floodplains, explain why flood-hazard disclosure under AB 1195 appeared to affect only Hispanics.

Addressing this problem on a national level will require that Congress amend the National Flood Insurance Act so that, nationwide, disclosure occurs through mechanisms similar to those of AB 1195—namely, written disclosure by the seller and the seller's agent prior to transaction. Currently, disclosure occurs through the mortgage-origination process. Under this process, many homebuyers obtaining their loan from federally unregulated institutions do not receive disclosure until long after the transaction.

Given that such a major change in policy is unlikely any time soon, a more realistic policy recommendation is that FEMA conduct studies in other parts of the country to determine whether disclosure under the NFIP is occurring with equal frequency across racial/ethnic groups or whether certain groups are more likely not to receive disclosure, or do so only after the transaction has been completed. Meanwhile, we recommend that both state and federal governments conduct independent audits to determine the extent to which Hispanics are disproportionately served by subprime lenders and whether these lenders do conduct flood-hazard designations and disclosures prior to transaction less often than do other types of lenders.

WILDFIRE-ZONE HAZARDS

Much of California's land area, and much more of its new development (especially in Southern California, the Coast Range, and the Sierra foothills) is subject to wildfire hazard.⁵⁰ Much of this area is mapped as hazardous land. However, our results suggest that mapping and disclosure are not enough to reduce consumers' willingness to pay to live in these areas. It is only when disclosure is combined with the recent occurrence of a nearby fire that a negative price effect is detected.

The fact that recent experience with wildfires combined with disclosure reduces property values may be due to or compounded by the fact that after a fire, homeowners insurance coverage becomes more expensive or impossible to obtain, and disclosure makes potential homebuyers more aware of that concern. It may be that prior to AB 1195 many homebuyers did not realize during the purchase process that they might have trouble obtaining adequate or affordable insurance coverage in an area with a recent fire. Hearing about a recent fire, combined with seeing the disclosure form, might spur prospective homebuyers to do more research on what coverage they need, what is available, and what it costs to get the desired level of coverage before they bid. Better information about the difficulties or costs associated with adequately insuring a structure in such a zone should translate into lower bids.

Another possible explanation for the price reduction is that following major fires, houses in the neighborhood received "non-renewal" notices from their insurance companies, stating that they would no longer cover the property, after which many homeowners might have sold their properties. In areas where disclosure is required, however, that unavailability was probably harder to hide from prospective buyers than in unmapped areas, where the disclosure form may have encouraged prospective buyers to conduct more rigorous research on insurance availability. Regardless of the underlying mechanism, the results show that location near a recent fire by itself is not sufficient to reduce property values; disclosure is also necessary.

Mandatory hazard disclosure will become only more important over time as more homes are built in flammable environments, more structures are exposed to risk, more fire suppression and fuel buildup occur, and catastrophic vegetation and structure fires become more likely. Casualty insurance companies will be exposed to increasing levels of risk and may stop underwriting fire policies for increasing numbers of urban-wildland interface areas, further driving up the risk associated with living in these areas. Over time, it is not out of the question that this vicious cycle of fire risk could significantly reduce demand for living in fringe, urban wildland settings, which would signal to developers to reduce investments in these areas. If the increasing destructiveness of conflagrations makes consumers more aware of and attuned to the hazards of wildfire, mandatory disclosure will play an extremely important role.

⁵⁰ For a further discussion of the wildfire policy issues described below, see Troy and Kennedy (in preparation).

THE FAIR PLAN

The price-reducing effects of wildfire-hazard disclosure in areas that have seen a recent fire underscore the need for the state to enact policies that increase information about fire hazard and decrease subsidies and incentives to overdevelop these areas. However, current policy on property insurance might actually be unintentionally providing an incentive for such development. In 1968, California created the FAIR (Fair Access to Insurance Requirements) Plan, a state-regulated statutory insurance industry association that provides basic property insurance to property owners who are unable to obtain it in the private market (known as an insurer of last resort).⁵¹ It was designed to insure against risks of wildfire and riot, but soon came to cover other uninsurable risks. Essentially, the FAIR Plan requires insurance companies to pool their risk on high-risk properties. In 1996, State Insurance Commissioner Quackenbush limited FAIR Plan brushfire coverage to just a few areas in Los Angeles, Santa Barbara, Ventura, San Bernardino, and Orange counties, given the increasing burden of brushfire settlements on insurance companies. However, in June 2001, the Insurance Commission (under Harry Low) expanded FAIR Plan brushfire coverage to all parts of the state for properties where privately underwritten coverage was not available (provided that the homeowner proves that they approached three insurance companies and were denied).

As FAIR Plan geographic restraints were eased, demand for FAIR Plan coverage grew enormously, with over 160,000 urban homes and 20,000 homes in brushfire zones insured through it,⁵² and over \$35 billion in exposure.⁵³ This demand for FAIR Plan coverage was pushed by the decreasing availability of casualty insurance through the private market in many high-risk wildfire areas and pulled by the low cost of FAIR Plan premiums, which average \$350. Some consider these rates to be so low that they constitute a subsidy, from residents in low-risk neighborhoods to those in higher-risk neighborhoods. While rates for FAIR Plans in California and other states were intended to be “break-even,” according to *Insurance Issues Update*, they are generally lower than market rates for similar risk levels and have historically lost money.⁵⁴

A proposed bill in the California legislature (AB 2444, sponsored by Assemblymember Dutton) attempts to begin dealing with this issue by requiring the FAIR Plan to provide an annual report to the legislature stating the number of policies in force as well as the probable maximum losses in brushfire-hazard zones. The impetus behind the bill is the contention that the increase in the number of policies written through the FAIR Plan is an indication of problems in the state’s insurance market and development patterns. In a memo in support of AB 2444, the Personal Insurance Federation of California, an industry lobbying group, writes, “in competitive, well-functioning markets, residual market mechanisms like the California FAIR Plan should have a relatively low number of policies as compared to the private market. The total number of policies in force and the probable maximum losses under the FAIR Plan can be an indicator of availability in the voluntary market and of the overall stability of the property insurance market.”

⁵¹ Pursuant to Insurance Code § 10091(c).

⁵² Los Angeles Times, Sept 28, 2003: “Hard to insure; Homes from lush canyons to city cores are sometimes shunned by insurers. California’s FAIR Plan can be a last resort,” by Jeff Bertolucci.

⁵³ Ruth Gastel, “Residual Markets.” *Insurance Issues Update*, June 2004.

⁵⁴ Ibid.

Through its subsidies, FAIR Plan distorts the pricing of risks and encourages continued development in hazardous wildfire zones by spreading the risks over the population of all insurance ratepayers. Expanding the geographic coverage of the FAIR Plan increased the level of this subsidy, providing a perverse incentive to developers to build housing in some of the more hazardous and ecologically sensitive lands in the state, furthering the cycle of fire suppression and catastrophic conflagration.

This perverse incentive could be remedied—and in fact turned into a useful planning tool—by reinstating geographic limits on the FAIR Plan for future development, while grandfathering in all existing structures. State and local planners would collaborate to designate a limited set of undeveloped brushfire hazard areas where FAIR Plan coverage would be permitted. This, combined with the restriction of FAIR Plan availability in other areas, could be used to direct and focus new development within geographically defined zones in which that risk could be better managed. By keeping the extent of these new communities contained, planners could design and more effectively enforce regulations to ensure better fire-safe design, materials, landscaping, and emergency response.

OTHER LIMITATIONS TO DISCLOSURE

Other state policies also may be unintentionally encouraging development in hazardous places. While AB 1195 is a good step forward in conveying the importance of fire hazards in property transactions, currently many homebuyers receive imperfect or misleading information about those hazards because of inconsistencies in the designation of very high fire-hazard severity zones (VHFHSZs). The VHFHSZs are intended to apply to the most heavily populated and developed parts of the state, where a major fire could be catastrophic. Unlike FEMA and the California Department of Forestry, who respectively have a single national mapping standard for flood zones and consistent statewide mapping of State Responsibility Areas, VHFHSZ mapping is controlled by various, uncoordinated local governments—each with its own agenda. Moreover, localities have an interest in understating hazards in order to draw residents and boost the tax base.⁵⁵

⁵⁵ There are several reasons why many communities with VHFHSZs would be against having fire-hazard zones designated within their borders. In a lengthy review of the fire regulations of all California communities containing designated VHFHSZs, the University of California Forest Products Lab and the CDF found that most communities simply do not want the stigma of having a “high fire hazard” area within their borders, especially in areas that have significant and upscale residential development (Irby et al. [1999]). Because of this, only about half of the 100 jurisdictions with CDF-recognized VHFHSZs have acknowledged this designation. Of this group, only a few have actually formally adopted it, the rest using the maps for their own hazard mitigation efforts. Such avoidance makes sense to local governments when analyzed in Charles Tiebout’s (1956) framework of interjurisdictional competition, which states that residents “shop” for jurisdictions to live in based on distinct “service bundles” (e.g., school quality, environmental quality, other public services, etc.) and tax burdens, and that local governments compete for those residents who will maximize tax revenue relative to service consumption—namely, wealthy people. To local governments, the imposition of onerous hazard-zoning regulations, including the negative designation in itself, could clearly be perceived as a way of detracting from the attractiveness of the locality’s service bundle, and adding to the entry price into the community in the form of greater homeowner costs.

The Oakland Hills fire of 1991 offers an example of the Tiebout process at work with wealthy homeowners. The Claremont Hills areas constituted a large proportion of the wealthy housing of the City of Oakland. Following the fire, a large proportion of Oakland’s wealthy residents found themselves without homes, but generally with large insurance settlements. In the context of the Tiebout model, these people’s transaction costs for moving had been reduced significantly, and the city feared that it would lose those residents and their property-tax dollars to other nearby

The drafters of AB 1195 introduced the potential for inconsistencies when they chose to rely on the mapping designations carried out under the Bates Bill, which allowed many jurisdictions to exempt their lands from fire-hazard designation arbitrarily and without any justification or review from the state. Hence, some of the most fire-prone Local Responsibility Areas, including the Oakland Hills, where the 1991 fire caused over \$1 billion in damage and took 25 lives (and, ironically, led to the passage of the Bates Bill), are not officially classified as a VHFHSZ, meaning that the legal obligation for homesellers in those places to disclose is far from clear. We recommend that either the AB 1195 legislation be amended to clarify that disclosure should occur for all properties in VHFHSZs, as designated pursuant to the original state VHFHSZ mapping conducted before the local review of and amendment to those maps; or that it be amended to allow for local revision of state VHFHSZ maps, but granting the state the discretionary authority to review and reject those revisions that lack sufficient justification.

An additional problem with mapping under AB 1195 is that the Natural Hazard Disclosure (NHD) Statement may provide a false sense of security in some cases. Many homebuyers might not realize that other types of hazardous areas are not subject to disclosure under AB 1195. An NHD Statement indicating that a house is not in a designated statutory hazard zone might mislead some consumers to believe that the property is free from all potential natural hazards, when in fact the NHD Statement only includes a subset of all possible hazards. NHD Statements should contain far more explicit and prominent wording about the fact that other types of hazards not included on the statement may affect the property. In particular, we highly recommend that landslide-hazard zones—a notable omission—be mapped and added as another hazard zone for which AB 1195 disclosure is required.

A CONTINUING ROLE FOR GOVERNMENT

Our study shows that a market-based approach to hazard disclosure—in which a buyer is assumed always both to be fully informed and to make an economically rational choice—can influence real-estate prices in some settings. But can it meet policy goals balance as effectively as regulatory approaches? Hazard disclosure has changed the amount consumers are willing to pay for hazard-zone properties to a certain extent. Does this reduce disaster losses to individuals and governments? Clearly it does in some manner—in the form of raising awareness, reducing unpleasant surprises, and possibly subtly restructuring peoples’ living preferences in a way that may be expressed as lowered disaster costs in the long term. More fundamentally, it changes the locus of responsibility. Disclosure appears an ideal fix for a society focused on personal responsibility, for it gives the individual “economic actor” information—a critical tool for making a responsible choice.

affluent jurisdictions (Topping 1996). To encourage local residents to stay, the local government claimed “functional equivalent” to the Bates Bill, which exempted any of its lands from being mapped as VHFHSZs, and they rescinded previous local fire-zoning ordinances for the neighborhood, allowing residents to rebuild new houses with no setbacks and no design requirements. This shows not only that residents do not like negative designations and land-use regulations, but that cities are responsive to wealthy constituencies. Where a potential loophole is offered to avoid designation, many cities will exploit that opportunity, with the result that Local Responsibility Area fire maps used for disclosure purposes now greatly understate the extent of fire risk. Later amendments to the legislation or court cases could resolve this by giving precedence in disclosure requirements to designations pursuant to Civil Code section 51178.

This is a laudable goal, but the effectiveness of disclosure in reaching this goal depends upon the rationality level of individual economic actors when faced with risk. Therefore, correcting information asymmetries through mandatory disclosure may not be enough to resolve problems like development in hazardous areas and mounting government disaster-aid payments. Disclosure is an important first step toward personally responsible management of risk from natural hazards, but it is insufficient on its own, both because of an inability of all consumers to achieve “pure rationality” in assessing the uncertainty and risk associated with natural disasters, and because government provides a safety net to all individuals, in the form of disaster assistance, which inadvertently provides an incentive to live in hazardous areas.⁵⁶ This safety net serves a very important social purpose. Because people rely on it when worst-case scenarios occur, a pure free-market approach to hazard mitigation is unworkable. In this respect, belief that disclosure is a step toward fostering a pure self-responsibility approach to government constitutes a delusion, because the goal is unattainable. The involvement of government in natural-hazard mitigation and disaster assistance is inevitable.

Therefore, while disclosure is critical to correcting major gaps in the information that is needed to make good decisions and protect consumers, government regulation and planning are still needed to limit and direct development in hazard zones and ultimately to reduce the burden of disaster aid.⁵⁷ As development increasingly moves into hazardous areas over the next decades, the involvement of governments in all aspects of hazard mitigation must increase. Because local governments do not bear most of the financial burdens caused by major disasters, leadership will have to come from state and federal levels.

⁵⁶ Kask and Maani (1992).

⁵⁷ See, for example, Burby (1998); Burby et al. (1988); Faber (1996); Holway and Burby (1993); and National Review Committee (1989).

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APPENDIX A

Tier 1 Sampling

Table A-1 Number of Zip Codes Categorized by Population Density and Price											
Hazard = Just Flood Population Density						Hazard = Just Fire Population Density					
		60-1000	1000-5000	5000+				60-1000	1000-5000	5000+	
House Price 1999	<150K	49	50	20	Total 239	House Price 1999	<150K	48	14	6	Total 303
	150-250K	13	28	24			150-250K	55	32	17	
	250K+	4	22	29			250K+	49	63	19	
Hazard = Both Flood and Fire Population Density						Hazard = No Flood and Fire Population Density					
		60-1000	1000-5000	5000+				60-1000	1000-5000	5000+	
House Price 1999	<150K	43	10	0	Total 120	House Price 1999	<150K	35	22	80	Total 403
	150-250K	16	15	1			150-250K	3	36	98	
	250K+	15	20	0			250K+	3	43	83	

APPENDIX B
Selected Regression Result Tables

Table B-1 Summary Results for Flood-Zone Regressions						
	Model 1			Model 2		
	Value	t value		Value	t value	
(Intercept)	9.0599	231.932 **		9.0823	232.50 3 **	
FLOOD	0.0097	0.779		-0.2032	-7.729 **	
AFTER	0.0405	7.104 **		0.0390	6.860 **	
ASSDSTC	0.3139	62.070 **		0.3126	61.919 **	
BATH	0.0233	4.834 **		0.0231	4.811 **	
BED	0.0380	9.999 **		0.0367	9.679 **	
SIZE	0.0017	25.923 **		0.0017	26.380 **	
LOT	0.0176	9.193 **		0.0175	9.134 **	
NEW	0.0395	4.832 **		0.0352	4.310 **	
OLD	-0.0661	-4.876 **		-0.0591	-4.361 **	
D2STAR	-0.0062	-13.048 **		-0.0064	-13.472 **	
AVG.RANK	0.4002	38.854 **		0.4020	39.101 **	
AGE	0.0260	35.402 **		0.0259	35.269 **	
PHISP	0.0033	11.116 **		0.0035	11.679 **	
PUNEMP	-0.0171	-17.537 **		-0.0177	-18.197 **	
MHHINC	0.2292	22.255 **		0.2121	20.307 **	
CBDIND2	0.0540	25.330 **		0.0520	24.326 **	
D2HIWAY	0.0004	0.138		0.0003	0.115	
SDIND1	-8.2461	-19.455 **		-8.2618	-19.530 **	
PADJ	0.7745	35.715 **		0.7798	36.015 **	
NRCOAST	0.1709	10.011 **		0.1742	10.220 **	
COAST5K	0.1511	15.596 **		0.1515	15.667 **	
COAST15K	0.0851	10.561 **		0.0801	9.938 **	
I(SIZE^2)	-2E-07	-36.196 **		-2E-07	-36.618 **	
I(BATH^2)	-0.0025	-8.288 **		-0.0025	-8.350 **	
I(BED^2)	-0.0008	-4.825 **		-0.0008	-4.695 **	
I(D2STAR^2)	0.0001	11.694 **		0.0001	11.851 **	
I(D2HIWAY^2)	-0.0013	-4.081 **		-0.0013	-4.102 **	
FLOOD:AFTER	-0.0422	-2.596 **		-0.0365	-2.246 *	
FLOOD:MHHINC	NA			0.2456	9.203 **	
FLOOD:MHHINC: AFTER	NA			X (P=.18)		
FLOOD:PHISP	NA			NA		
FLOOD:PHISP: AFTER	NA			NA		
R ²		.75			.75	

Note: For description of variables, see Table 1.

* Significant at the 95% confidence level.

** Significant at the 99% confidence level.

NA: Not applicable; terms that were not tested in the given model.

X: Terms that were tested in the model and dropped because they were insignificant at the 90% confidence level, and models were re-estimated. Where several interaction terms were dropped, they were removed through backwards stepwise elimination. This was done because leaving in the insignificant terms biased the remaining FLOOD interaction terms such that the models could not be meaningfully solved to examine price effects. P values from before the terms were dropped are given in parentheses. See footnote 31 for more information.

Table B-2 Summary Results for Fire-Zone Regressions							
Model 4				Model 5			
	Value	t value			Value	t value	
(Intercept)	9.974054	299.3104	**	(Intercept)	9.972686	299.1669	**
FIRE	0.031661	3.87413	**	BURN5K	-0.0000331	-0.00682	
ASSDSTC	0.240928	54.78647	**	FIRE	0.030905	3.72656	**
TOTALRMS	0.007996	4.66944	**	ASSDSTC	0.240983	54.7132	**
BED	0.03268	9.363532	**	TOTALRMS	0.008198	4.781557	**
CBDIND2	0.006169	3.293607	**	BED	0.03271	9.373784	**
SIZE	0.00199	33.65162	**	CBDIND2	0.006754	3.553961	**
LOT	0.057109	18.29313	**	SIZE	0.001987	33.59413	**
MHHINC	0.218491	24.39598	**	LOT	0.056723	18.15798	**
AVG.RANK	0.007355	9.415633	**	MHHINC	0.223842	24.01321	**
PRRATIO	0.536056	66.33163	**	RANK.AVG	0.007027	8.934583	**
SDIND1	-0.70785	-2.13005	*	PRRATIO	0.534305	66.0112	**
AFTER	0.045208	8.911416	**	SDIND1	-0.83788	-2.50078	*
AGE	0.011914	18.87049	**	AFTER	0.045136	8.898438	**
PADJ	0.259992	14.38952	**	AGE	0.011824	18.5505	**
PHISP	0.001582	6.839211	**	PADJ	0.262618	14.50432	**
PUNEMP	-0.01402	-16.9092	**	PHISP	0.001562	6.754727	**
D2HIWAY	0.01904	7.5171	**	PUNEMP	-0.01389	-16.7343	**
I(BED^2)	-0.00107	-15.4808	**	D2HIWAY	0.018777	7.404926	**
I(LOT^2)	-0.00049	-13.7369	**	I(BED^2)	-0.00107	-15.5168	**
I(SIZE^2)	-0.0000003	-28.8531	**	I(LOT^2)	-0.00049	-13.5997	**
I(D2HIWAY^2)	-0.00287	-10.2281	**	I(SIZE^2)	-3E-07	-28.8332	**
FIRE:AFTER	0.019207	1.849423		I(D2HIWAY^2)	-0.00285	-10.1573	**
				FIRE:AFTER	0.051203	3.705952	**
				FIRE:BURN5K:AFTER	-0.05117	-3.49918	**
R ² : 0.7736297 F-statistic: 3754.789				R ² : 0.7737552 F-statistic: 3444.073			
Note: For description of variables, see Table 1. * Significant at the 95% confidence level. **Significant at the 99% confidence level.							

APPENDIX C

Selected Mail Survey Results

Mail survey responses yielded important information about the implementation of the law and people's attitudes toward natural hazards in regard to their property, but the 16.4% response rate (197/1,200) was too low to reveal statistically significant trends for California. The low response also pointed to the possibility of a selection bias, something that frequently appears when response rates are low and followup mailings are not undertaken. Still, enough of a representative response was garnered across the spectrum of geography, income, and education (though not race) that the results are of use and should not be discounted.

The most important result that came from mail surveys was strong evidence that homebuyers are seeing the Natural Hazard Disclosure (NHD) statement. Of 197 respondents, 173 of whom purchased a home since implementation of AB 1195, 129 recalled seeing the form, even though 16 of them claimed that the form said they were not in a hazard zone. The fact that 75% of respondents who purchased after the law was implemented remembered seeing the form implies that disclosure is occurring in the vast majority of transactions, since it is likely that many of the 25% who do not remember seeing the form did receive one but do not remember.

Another important result was that very few people remember seeing the NHD Statement early in the home-buying process, with only three respondents seeing it at an open house. Of the 126 who answered this question, 57 saw it while signing the final papers, 16 saw it during the offer process, and 14 saw it during escrow. Many respondents did not recall when they saw it. This result suggests that disclosure might not be having as big an effect on sales price as it could, because the later this information comes to light during the process, the less likely it is to affect the bid or the sale-price negotiation.

Table C-1 Survey Response: When Was Natural-Hazard Disclosure (NHD) Seen in Buying Process?	
When Saw NHD	Count
After offer	1
Before closing	2
Before final papers	1
Disclosure	2
Don't recall	24
During inspection	2
During offer	16
Escrow	14
Final papers	57
Final walk through	1
Inspection	1
Open house	3
Other	2

As far as disclosure's effects on buyers' behavior or thinking, the results are more equivocal, perhaps because there are not enough observations relative to the number of categorical groupings. Of the 95 households who saw the NHD Statement, knew they lived in a hazard zone, and answered

the question, 57, or 60%, said that knowing the house was in a hazard zone did not give them second thoughts about buying at all. Only one said it gave them second thoughts “a lot,” and 37, or 39%, said that it gave them second thoughts either “a little” or “somewhat.” Of 96 respondents who fit the criteria and answered the next question, 80 said it did not make them bid less, 2 said it made them bid “much less,” and 14 said it made them bid either “somewhat less” or “a little less.” In other words, it had no effect on the bidding for 83% of the transactions, and some effect on 17%. However, of the 96, only 25 (26%) said that they did not consider the property’s hazard-zone location as important when buying. Thirty-nine considered it “slightly” important, 24 “somewhat” important, and 8 “very” important. That means that 74% considered it of at least some importance.

When broken down by hazard, however, flood seems to elicit more concern. In response to the question about how important hazard-zone location was as a consideration, 73% of fire-zone owners considered it to be not important or only slightly important, while that percentage was only 51% for flood-zone owners, with 49% believing flood-zone location to be “somewhat” or “very” important.

These results are in response to questions about respondents’ *own* homes; they partially conflict with the results that respondents gave about the importance of avoiding hazards in a hypothetical future housing transaction. Of 195 who answered the question, only 4% said it was not important, 24% said it was “slightly” important, 38% said it was “somewhat” important, and 33% said it was “very” important. In other words, it appears that many people are aware of hazards and wish to avoid them in the abstract, but do not consider their current hazardous location to be a significant problem.

The results for added expenses were somewhat inconsistent. Many more people marked that they had bought flood insurance than claimed to be located in the flood zone, which is not impossible. Many people in the 500-year floodplain buy flood insurance although they are not required to do so and are not subject to disclosure. About the same number that claimed to be in a statutory fire zone also said they were undertaking vegetative clearance or defensible space maintenance, although some of those in the fire zone answered negatively to this question, while some outside of it answered it affirmatively.

Finally, respondents were asked to rank hazards from 1 to 8 in relation to seven other housing concerns: crime, commute distance, air pollution, view, house age, proximity to open space, and school quality, with 1 being the highest score (see Table C-2). As shown, the median rank for hazard is 4. Of 187 respondents to the question, only 14% ranked hazards in the top two categories, while 18% ranked it in the bottom two categories. However, the fact that natural hazards were generally ranked somewhere in the middle indicates that they are a serious consideration of most homebuyers.

Table C-2 Counts of Ranks for the Importance of Considering Hazards When Buying a Home	
Rank for hazard	Count
1	6
2	20
3	34
4	36
5	27
6	30
7	26
8	8
Note: 1 is most important, 8 is least.	

Questions were also asked about the education, income, race, zip code, and the respondents' previous experience with hazards. However, there were not enough responses to allow for meaningful cross-tabulations of important survey questions by these categorical groups.