Risk Disclosure and Home Prices: Evidence from California Wildfire Hazard Zones

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Abstract

Damages from wildfires have increased dramatically in recent years. This study uses a boundary discontinuity design to estimate the effect of wildfire hazard disclosure on house prices. Using the universe of single-family sales transactions from the Zillow ZTRAX program in California from 2015 through 2022, we find that, on average, homes that faced disclosure requirements sold for approximately 4.3 percent less than nearby homes that did not. Price impacts are higher in recent years, following several damaging wildfires. Our findings highlight the use of disclosure regulations to ensure that disaster risks are reflected in housing markets.

Contents

1. Introduction

The growing exposure of people and property to natural hazards, such as floods and wildfires, is a significant contributor to the rising costs of US disasters (Higuera et al. 2023). Homes in the wildland–urban interface (WUI), the transition zone between natural and developed lands where the built environment intermingles with forested areas, account for most of the properties lost in wildfires (Kramer et al. 2019). By some accounts, WUI is the fastest-growing land use type in the conterminous United States (Radeloff et al. 2018), and more than 600,000 new homes are expected to be built in high-wildfire-hazard areas in California alone by 2050 (Mann et al. 2014).

Whether people consider disaster risks when making decisions about where to live, and whether such risks are capitalized into house prices, are open questions. One challenge to answering these questions in an empirical setting is causal identification. Disasters are often highly correlated with natural amenities: floods with proximity to rivers and oceans and fires with forested landscapes, access to public lands, and views. Thus, distinguishing the effect of risks from amenities can be difficult. Furthermore, whether homebuyers fully understand risks and how these vary across properties and how much they incorporate risks in their decision-making is unclear.

Tackling the issue of correlated amenities and missing or incomplete risk information is more straightforward for floods than wildfires because the federal government officially designates high-flood-risk areas, Special Flood Hazards Areas (SFHAs), commonly referred to as the "100-year floodplains." When a home is located in an SFHA and has a federally backed mortgage, the homeowner is required to have flood insurance, and in most states, the SFHA designation must be disclosed upon sale. This provides a spatial delineation of risks. Some studies have combined this spatial distinction with the timing of major flood events in a differences-in-differences hedonic regression (Bin and Polasky 2004; Kousky 2010; Atreya et al. 2013; Atreya and Ferreira 2015; Beltran et al. 2019). Others have used a boundary discontinuity design (BDD), comparing home sales in close proximity to, and on either side of, the SFHA boundary to isolate the effect of flood risks on home prices (Bakkensen and Ma 2020).

The wildfire setting has some important differences from the flood setting. Insurance is generally provided through standard homeowner policies, not a wildfire-specific policy, with no federally mapped high-hazard zone. It is thus unclear the extent to which homebuyers understand the risks when purchasing a home in wildfire-prone areas. Perhaps for these reasons, the literature on hedonic pricing of wildfire risks is thin.

In California, however, homebuyers may better understand wildfire risks, at least in some locations. California law requires that sellers of properties in certain designated hazard areas disclose this information to buyers, based on properties' locations with respect to mapped hazard categories and the jurisdiction responsible for wildfire management. Where the state is responsible for management (State Responsibility Areas [SRAs]), disclosure is required anywhere the state classifies as a Fire Hazard Severity Zone (FHSZ).[1] In areas where local jurisdictions are responsible (Local Responsibility Areas [LRAs]), disclosure is required only in very-high FHSZs. We refer to these two types of areas where disclosure is required as “regulated” and identify, throughout the state, the geographic boundaries between regulated and unregulated areas. We then focus on how much disclosure affects home prices, which provides some evidence on how wildfire risk may affect homebuyers’ decisions.

We use a BDD (see, e.g., Black 1999; Turner et al. 2014; Bakkensen and Ma 2020) comparing sales of homes that are nearby but on either side of a regulated area boundary. The primary identifying assumption required is that although disclosure requirements change abruptly at the boundary, unobserved variables that may be correlated with wildfire hazard vary continuously across it, at least within some distance band close to the boundary. Disclosure requirements are also determined by wildfire management responsibility—whether a property is in an SRA or LRA—so we compare nearby properties with similar hazard levels but different disclosure requirements. Specifically, in our main results, we compare prices of nearby homes within high FHSZs that do and do not have disclosure requirements.[2] In this way, our empirical methods should isolate the effect of risk disclosure on home prices.

Using data from the Zillow ZTRAX program on 2015–2022 home sales in California, a period of unprecedented wildfire activity and damages, our results show that high-FHSZ homes with disclosure requirements sold for approximately 4.3 percent less than nearby homes without such requirements. Consistent with expectations, homes within moderate FHSZs also sold for less (2.6 percent less) if they were subject to disclosure requirements. We investigate geographic heterogeneity in our results by estimating separate regressions for northern and southern California; the estimated impacts are stronger in the latter. When we estimate separate effects by year, the magnitude of the price discount increases in the later years of our sample, 2020 and 2021, which followed several years of large and damaging fires.

This study contributes to a literature that attempts to uncover household risk preferences with respect to natural hazards and the effect that these hazards have on home prices, which has used two primary empirical approaches. First, many studies in the flood context (e.g., Bin and Polasky 2004; Kousky 2010; Bakkensen et al. 2019; Gibson and Mullins 2020), have used difference-in-differences approaches that rely on hazard events for identification. A common finding is that prices within high-hazard areas decline relative to low-hazard areas following nearby hazard events, but these declines are short lived, usually no more than 2–3 years. In one of the few studies applying this approach to wildfires, McCoy and Walsh (2018) use data from Colorado

1 California divides Fire Hazard Severity Zones (FHSZs) into moderate, high, and very high categories. We discuss these zones in greater detail in Section 2.

2 Although we limit our main analysis to high FHSZs to control for unobserved wildfire hazard correlates, our results are robust to limiting the sample to moderate FHSZs, which also have variation in regulation.

and find a price discount for properties in high-risk areas after a fire and that the discount is larger and more immediate for properties that have a view of a burn scar from a recent fire.

A second but somewhat less common approach has been policy-based information treatments. Studies adopting this approach have often analyzed changes in house prices using difference-in-differences strategies centered on adoption of or revisions to disclosure policies or hazard maps. For example, Pope (2008) found that following a flood risk disclosure law in North Carolina in 1996, home prices in SFHAs declined by approximately 4 percent relative to homes outside SFHAs. Donovan, Champ, and Butry (2007) found that following the online publication of wildfire risk ratings in Colorado Springs, Colorado, wildfire risk, which had been positively correlated with home price, became negatively correlated.

A few studies using policy-based information treatments have also used BDDs. Bakkensen and Ma (2020) use SFHA boundaries to identify flood risk preferences from home prices. They find that prices are approximately six percent lower just inside the flood zone, where buyers tend to receive more information about flood risks, even though risk varies continuously across, and in close proximity to, the flood zone boundary. Finally, in the study most closely related to ours, Garnache (2020) analyzes how revisions to the FHSZ maps affect house prices. Focusing on seven counties in southern California, Garnache (2023) compares changes in home prices just outside a new boundary to those just inside and finds that newly regulated homes drop in price by 3–6 percent.

Hedonic studies in other contexts have estimated the impact of information and disclosure programs on property sales prices and rents. Most notably, several studies have found that energy and “green” property certifications, which typically provide a label or “score” to indicate energy efficiency and other hard-to-observe environmental features, tend to increase prices and rents. These results have been found for residential (Walls et al. 2017; Brounen and Kok 2011) and commercial properties (Brolinson et al. 2023; Eichholtz et al. 2013).

Our paper makes several key contributions to the relatively small literature estimating the capitalization of wildfire hazard into home prices. First, we use very recent data (2015–2022), when wildfire damages in California rose dramatically. Second, our data set includes transactions from across California rather than small geographic areas common in many hedonic analyses. This facilitates the BDD approach and allows us to consider spatial heterogeneity across regions of the state. Third, although our main results use a pooled cross-section time-series dataset with seven years of data, we also estimate our model on separate single-year cross sections. This addresses the critique that, due to changes in population and preferences, samples using multiple years may mix different hedonic equilibria, obscuring the interpretation of the estimates as a welfare measure (Kuminoff and Pope 2014; Banzhaf 2021). Furthermore, by estimating our model separately by year, we are able to consider how preferences to avoid wildfire hazard may have changed over our study period. Finally, our empirical strategy, using regulated boundaries in areas classified as having the same level of hazard, achieves the twin goals of isolating the impacts of risk disclosure requirements and reducing omitted variables bias from unobserved amenities that are correlated with wildfire hazard.

2. Wildfire Hazard Disclosure Laws in California

California law requires sellers of properties in designated wildfire hazard areas to disclose this information to buyers in a Natural Hazard Disclosure statement, which is used for a variety of state and federal hazards (Troy and Romm 2007)[3] and also warns buyers about the potential for challenges in obtaining insurance and developing the property. It is mandated before escrow; buyers then have a three-day period during which they are allowed to back out of the purchase.

For wildfire, disclosure requirements are determined based on the degree of hazard (the FHSZ) and the jurisdiction responsible for wildfire management in the location ("responsibility areas"). Within California, jurisdictional responsibility for wildfire management is divided across Federal Responsibility Areas (FRAs), SRAs, and LRAs. These areas roughly correspond to federal lands, unincorporated nonfederal lands, and lands under the jurisdiction of a local fire department.[4]

The wildfire hazard component of disclosure requirements is based on FHSZ maps. Within SRAs, CAL FIRE designates moderate, high, and very-high FHSZs based on fire history, vegetation, and modeled predictions of fire behavior. Within LRAs, CAL FIRE recommends the boundaries of FHSZs; however, local communities make the final decision regarding whether these are adopted. Most communities have done so.[5] During the period of our data, disclosure regulations and building codes applied to only very-high FHSZs within LRAs. Other FHSZ classifications were not formally adopted within LRAs, but CAL FIRE maintains data on modeled fire hazard levels in

3 Almost all counties have Community Wildfire Preparedness Plans, which are necessary for receiving some sources of federal wildfire mitigation funding (FEMA 2020; Jakes et al. 2012). These plans are another potential source of information about wildfire risk; however, although they include some risk mapping, they are mainly focused on communicating ways that households can reduce flammable materials and structure ignitability. Homebuyers are not required by law to be informed of a plan upon purchase.

4 FRAs do not precisely correspond to federal lands because, under a policy known as the "balance of acres" arrangement, state and federal agencies have traded fire responsibilities in some areas to maximize efficiency (Starrs et al., 2018). This is especially common in areas with high checkerboarding due to nineteenth- and twentieth-century land disposal policies.

5 Following a map revision process that began in 2007, over 92 percent of communities CAL FIRE identified as containing very-high FHSZs either adopted the very-high-FHSZ maps or believed they had (Miller et al. 2020) Most communities did so by 2009; however, some communities in southern California did so as late as 2012.

these areas. As a result, LRAs and SRAs now comprise three FHSZ classifications. Table 1 shows the combination of responsibility areas and FHSZs where disclosure is and is not required.

Building codes requiring fire-resistant building materials and maintaining areas clear of vegetation ("defensible space") around homes were implemented in California beginning in the 1990s and substantially strengthened in 2008 by the "Chapter 7A" codes, which included requirements for siding, eaves, vents, doors, windows, and decks, in addition to requiring fire-resistant roofing materials for new construction.[6] Like the disclosure requirements, building codes applied to all FHSZ categories in SRAs and to the very-high category in LRAs. In our main analysis, we focus our attention on sales of properties built before 2008 to focus on disclosure impacts to prices and reduce effects of building codes.

3. Empirical Strategy

A basic model of the effect of wildfire hazard on home prices is given by the equation

$$\ln(P_{i,t}) = \alpha + \beta X_{i,t} + \gamma Z_{i,t} + \delta W_{i,t} + \nu_t + \epsilon_{i,t}, \qquad (1)$$

where the dependent variable $\ln(P_{i,t})$ is the logarithm of housing price for property *i* sold at time *t*. $X_{i,t}$ represents the property's structural characteristics; $Z_{i,t}$ represents its neighborhood characteristics at time *t*, where we have separated out wildfire risk $W_{i,t}$, our neighborhood characteristic of interest; ν_t represents time period fixed effects (e.g., year and month of sale); and ϵ_{it} denotes an idiosyncratic term that is unobserved by the researcher.

Recovering implicit prices of wildfire risk requires that buyers are informed of and attentive to that risk. It is unclear whether this full information requirement can be satisfied for homes in wildfire hazard areas, given the lack of federally mapped zones and separate insurance policy requirements. Thus, buyers might have been willing to pay less for a property with high wildfire hazard *had they known* about it; ignoring imperfect information about risks would attenuate willingness to pay to avoid those risks. Our focus on the price capitalization of disclosure helps us understand the extent of the information problem in hedonic valuation of wildfire risks.

We exploit spatial variation in where disclosure laws enforce providing information about wildfire hazard. Specifically, we define a binary treatment variable $Regulated_{i,t}$ equal to 1 if the property is located in an SRA an SRA with any FHSZ designation or in an LRA with a very-high FHSZ designation and 0 otherwise. When the Chapter 7A building codes were passed, the wildfire hazard disclosure requirement coincided with additional construction requirements for newly built

6 For a more detailed review of changes in California building codes related to wildfire hazard, see Baylis and Boomhower (2022).

homes. Therefore, we focus on properties built before 2008, when building codes for new properties in regulated areas were much less stringent; we argue that differences in price for regulated and unregulated homes built during this period are therefore likely to be driven by differences in disclosure requirements.

In addition, we face the prevalent problem of omitted variable bias. Although we have collected data on a host of neighborhood amenities (e.g., proximity to protect lands and school quality), it is impossible to collect all relevant information that covaries with wildfire hazard. This is particularly true because the same attributes that drive hazard (e.g., proximity to forests or other wildlands) are also valued as an amenity by many homebuyers.

We attempt to alleviate the omitted variables problem with various strategies. First, we include fixed effects at high spatial resolution and allow for county-specific time trends (Kuminoff et al. 2010). Second, we focus on a sample of sales near the disclosure regulatory boundary and compare properties on either side of the same boundary segment, similar to a regression discontinuity design (Imbens and Lemieux 2008). The identifying assumption in this design is that although disclosure requirements vary discontinuously at the boundary, unobserved attributes that affect home price do not; if amenities and other attributes do not change discretely at the boundary, any change in price at the boundary should be attributed to risk disclosure.

Regulated areas are defined in part as a function of wildfire hazard (see Section 2). We are concerned that places where regulated and unregulated status differs due to differences in designated hazard severity may vary in unobserved amenities across the boundary, in addition to differences in disclosure requirements. Therefore, we restrict the sample to transactions in high FHSZs and near boundaries between SRAs and LRAs. This allows us to better control for unobserved variation in amenities that are correlated with disclosure. Although this comes at the expense of reducing variation in wildfire risk, we retain variation in wildfire risk regulation. We modify our empirical specification to include these additional fixed effects and sample controls:

$$\ln(P_{i,t}) = \alpha + \beta X_{i,t} + \gamma Z_{i,t} + \delta Regulated_{i,t} + \nu_{c(i),t} + \nu_{b(i)} + \nu_{g(i)} + \epsilon_{i,t} \quad (2)$$

$$\forall i \; s.t. \, BoundaryDist_i < |\text{B km}|, FHSZ_i = \text{high},$$

$$BoundaryType_{b(i)} = \text{high FHSZ LRA/High FHSZ SRA},$$

where $\nu_{c(i),t}$ represents county-by-year fixed effects, $\nu_{b(i)}$ represents fixed effects for the boundary segment nearest to each transacted property, and $\nu_{g(i)}$ represents fixed effects at the 250km^2 grid cell level (which we discuss in greater detail in Section 4). We limit the sample to high-FHSZ properties within B km of boundaries between high-FHSZ LRAs (unregulated) and high-FHSZ SRAs (regulated), where B varies from 0.2 to 10. Our sample limitation, in conjunction with the boundary and grid cell fixed effects, allow us to identify effects of hazard disclosure on property values by comparing the sales of properties on either side of the same regulated boundary.

A potential problem created by the use of LRA-SRA boundaries for identification is that they frequently coincide with boundaries between incorporated and unincorporated areas, which may differ in taxes, regulations, and public good provision. Fortunately, unincorporated LRAs exist; therefore, it is possible to separate the effect of being in an incorporated area from the effect of wildfire hazard disclosure.

Our empirical strategy importantly assumes that homebuyers in areas where disclosure is not regulated are mostly unaware, or at least less aware, of wildfire risk than those in areas where disclosure is regulated. This is similar to assumptions in studies of flood risk and home certification schemes for energy efficiency—disclosure through flood maps or "green" labels provides information that homebuyers would otherwise not have. If this assumption is violated in our setting, our estimates of wildfire risk disclosure will be biased towards zero. We evaluate the effectiveness of our strategy when we present our findings.

4. Data

This study relies on data on home sales prices provided by the ZTRAX program.[7] Its data include both comprehensive transactions records and assessors' data. Transaction records provide information about property sale dates and prices; they can be linked within the ZTRAX database to the assessors' data to provide information on the characteristics of each property, which include lot size, year of construction for its buildings, square footage, number of bedrooms, number of bathrooms, and an array of other building and property factors.[8]

From the ZTRAX database, we assembled a data set describing property sales in California from 2015 to March 2022.[9] We focused on years since 2015 because, in this time, California experienced a dramatic increase in wildfire activity and damages: as of January 2022, fourteen of the most destructive wildfires in state history (California Department of Forestry and Fire Protection 2022b). Furthermore, we restrict our data set to arms-length purchases of single-family residential homes.[10] We also drop

7 Data are provided by Zillow through its Transaction and Assessment Dataset (see http://www.zillow.com/ztrax). The results and opinions are our own and do not reflect the position of Zillow Group.

8 Assessors' data can include records for more than one building associated with a single property. For each transaction in our data set, we measured property characteristics based on those associated with the largest building, in square feet, on the property.

9 Our data set includes all California counties save San Francisco, which is excluded because it is large but contains insignificant high-hazard areas.

10 We include in our sample properties with land use classified single-family residential, rural residence, and inferred single-family residential. To restrict attention to arm's-length transactions, we drop those with prices below $10,000.

transactions that include the exchange of multiple distinct properties. We are left with an initial data set containing 1.56 million observations.

For each transacted property, we use CAL FIRE spatial data to identify the location relative to responsibility areas and FHSZs and measure distance from the boundary between regulated and unregulated areas. [11] Figure 1 includes a map of FHSZs within SRA and LRA areas. Figure 2 provides a more detailed view of FHSZs in a single county, San Diego. As the state map shows, SRAs cover a larger land area. However, among FHSZ properties, nearly 70 percent of transaction observations (352,000 out of 519,000) are in LRAs.[12]

Following a procedure described by Bakkensen and Ma (2020), we divide boundaries between regulated and unregulated areas into discrete segments using the Polygon to Line tool in ArcGIS, and we measure the distance from each transacted property to its nearest boundary segment. [13] Our design uses boundary fixed effects to ensure that we are identifying differences in price between properties on either side of the same segment. Therefore, it is important that segments are neither too long (boundary effects would insufficiently account for differences across neighborhoods) nor too short (boundary effects would eliminate too much variation).

On average, our boundary segments are 3.4km and have 1,183 transacted properties nearest to them. We judge this to be a reasonable length. Nevertheless, segments necessarily vary in length, and ArcGIS yields some very long segments. Therefore, in addition to segment fixed effects, we divide California into a 250km^2 hexagonal grid and include fixed effects for each cell. For properties along long segments, these cell fixed effects account for differences in home prices across cells that may vary in unobserved neighborhood characteristics that affect prices.[14]

As discussed in Section 3, we are concerned that where boundaries between regulated and unregulated areas exist due to differences in fire hazard, differences in

11 We define FHSZs and responsibility areas using a data set assembled by CAL FIRE to provide accurate wall-to-wall descriptions of fire hazard within SRAs and LRAs. For SRAs, the data set includes FHSZs as adopted by CAL FIRE in 2007. Local communities generally adopt only very-high FHSZs, and statewide data on the precise boundaries of locally adopted very-high FHSZs are unavailable. Therefore, for LRAs, the data set includes boundaries of very-high FHSZs recommended for adoption by CAL FIRE. For other FHSZs in LRAs, fire hazard classifications are based on initial draft maps provided by CAL FIRE.

12 Federal Responsibility Areas (FRAs) are another category, and these encompass a large area of California. However, residential properties within these mostly federal lands comprise only 0.2 percent of transactions (1,450) in the sample; we drop these from the data set.

13 We also measure distances from regulated SRA areas to unregulated LRA areas and ignore unregulated FRA areas. This is because, due to checkerboarded federal landholdings in California (see Leonard et al. 2021), SRAs are frequently near boundaries with unregulated and relatively unpopulated FRAs.

14 For reference, counties in our sample average approximately 7,300km^2 and therefore approximately 29 cells.

amenities across these areas may confound identification of the effects of disclosure. Therefore, in our primary regressions, we restrict our attention only to properties that are closest to boundaries between high-FHSZ LRAs and SRAs. These properties face significant wildfire hazards but different disclosure requirements. With the sample restricted to properties in high-FHSZ areas, our primary final data set contains 164,019 observations over 2015–2022. In robustness checks, we also estimate effects of disclosure requirements for properties in moderate FHSZs.

In addition to the property and structural characteristics obtained from ZTRAX, we assembled property- and neighborhood-level covariate variables from a variety of sources. We measure wildfire hazard at the property level based on Wildfire Hazard Potential (WHP), an ordinal measure created by the US Forest Service to measure the potential for a site to experience a difficult-to-contain wildfire. We use data on historical fire perimeters from the USGS Monitoring Trends in Burn Severity project to identify transactions for properties that had been within a fire perimeter within five years before the year of sale.[15] Using the USGS Protected Area Database, we measure the distance of each property to the nearest area classified under GAP Status 1 or 2, a possible source of amenity values for homeowners.[16] To separate effects of location within incorporated areas, which frequently coincide with the boundary of unregulated LRAs, from exposure to disclosure requirements, we gather data on the extents of California incorporated areas from California Department of Forestry and Fire Protection (2022a). We use Summary File 1 data from the 2010 US Census data to measure the share of White residents within each property's block group. Finally, we measure school district quality using data from the California Department of Education on the percentage of students in each property's district who met or exceeded math and language arts standardized testing standards.

Table 1 lists summary statistics for our property characteristics, including transaction value. The average price is $625,000. As expected, fire hazard is higher among regulated than unregulated properties: 2 percent of properties in our overall sample and 6 percent in regulated areas had been within a fire perimeter in the five years before the observed sale. Regulated and unregulated properties are similar in number of bathrooms and bedrooms; however, regulated properties tend to average greater floor space, smaller lots, more recent build dates, and higher school district quality. Regulated areas also contain a higher proportion of White residents and are nearer to protected areas because they are often located in rural SRAs: only 47 percent of

15 McCoy and Walsh (2018) find evidence that proximity to (and views of) burn scars matter for house prices. Our boundary discontinuity design, comparing houses in very close proximity, eliminates the need to control for this factor. Just as amenities should be similar for houses on either side of the boundary, proximity to burn scars should be as well.

16 Protected areas with GAP Status 1 or 2 are permanently protected and have a management plan to maintain the lands in a natural state. These areas, which include national parks and wilderness, are distinguished from areas with lower GAP status, which may be protected from land cover conversion but subject to extractive uses, such as logging or mining.

regulated properties are within incorporated areas, compared to 84 percent of unregulated properties.

5. Results

We begin by using data on property-level WHP to explore the raw correlation with housing prices in our sample. This naive specification demonstrates our concerns about correlated risks and amenities. We then turn to our main results, using the boundary discontinuity approach for property sales in high-FHSZ areas for a pooled sample of sales over 2015–2022. We follow this with two robustness checks—one that includes sales in moderate FHSZs and one that separates the sample into incorporated and unincorporated areas—and specifications that allow for heterogeneity in effects by year and by region.

5.1. Results from Naïve Model

Our concerns regarding estimates of Equation 2 can be seen in Table 2, which regresses log housing prices on log WHP under different sets of controls to isolate wildfire risk's effect on prices. Evidence that homeowners are willing to pay to avoid risk is weak. In the specification with tract-level fixed effects, we find that risk is positively correlated with prices (Column 3), consistent with Wibbenmeyer and Robertson (2022) and viewshed analyses in McCoy and Walsh (2014). This counterintuitive result is likely driven by omitted variables bias. The problem is compounded if we assume that buyers are cognizant of the risks when they are not.

5.2. Main Results

In light of the estimates in the previous section, we turn to identifying the effects of wildfire hazard disclosure on home price using the BDD described by Equation 2. We first present results that do not limit the sample based on distance to the regulatory boundary in Table 3. The variable of interest is *Regulated*, which is an indicator for whether a property is located within an area that requires disclosure. All else equal, the coefficient should be negative. All specifications include the same set of house and neighborhood controls[17] and fixed effects for year and month of sale at baseline and have standard errors two-way clustered at the county and year levels.

Column 1 begins with the sample of all house sales. Prices are generally higher in areas with disclosure requirements. This is unsurprising because the requirements apply in

17 Controls include number of bedrooms, number of bathrooms, log of lot size, age, indicators for the decade of construction, square feet, share of White individuals at the census block group-level in 2010 Decennial Census, measures of school quality (percent meeting standardized testing standards for English/language arts and math), logged distance to a protected area, and indicators for location within the perimeter of any fire in the last five years and whether the area is incorporated.

areas with high wildfire hazard—which also tend to be rich in amenities (e.g., proximity to protected areas). This is alleviated when we limit the sample to high FHSZs in Column 2. Variation in disclosure regulation remains, but unobserved variation in correlated positive amenities is reduced, although the effects are not precisely estimated. In Column 3, we focus on properties built before 2008, to remove any confounding effects from the additional regulation. We then progressively add fixed effects: Column 4 removes correlated price changes due to county-specific trends with the inclusion of county-by-year fixed effects, Column 5 includes census tract fixed effects, and Column 6 adds 250km^2 grid cell fixed effects to limit the comparison to properties sold within a neighborhood to further control for correlated amenities. With these controls, we find that property sold in areas that require disclosure sell for 4.9 percent[18] less than areas that do not.

We next consider only houses sold in the vicinity of the regulatory boundary. We include boundary fixed effects to compare houses near the same boundary; because boundaries can span long distances, we include 250km^2 grid cell fixed effects to control for differences across neighborhoods. Figure 3 presents a binned scatter plot of logged price at various distances to the boundary, where the region to the left side of the vertical, dashed line is unregulated and the region to the right is regulated. We fit a fourth-degree polynomial to visualize the trend in prices across the boundary. The figure indicates that prices fall by around 3 percent at the boundary. Moreover, the trend in prices suggests that the magnitude of the price decrease would increase if the sample around the boundary expanded.

Table 4 presents the point estimates with the sample restricted to diminishing boundary distances, or “bandwidths.” At 10km on either side of the boundary, we find that disclosure regulation reduces housing prices by 2.5 percent ($p < 0.01$). As the boundary narrows, the estimated magnitude of the discount increases somewhat (in absolute value). At our preferred bandwidth of 300m, we find that properties in areas that require disclosure sell for a discount of about 4.2 percent ($p < 0.01$). The magnitude of the effect is comparable to work using disclosure laws to value wildfire hazard (Troy and Romm 2007; Garnache 2023); it is smaller than the effect estimated in McCoy and Walsh (2018) after a major wildfire event. As mentioned, if homebuyers understand wildfire risks without disclosure, our estimate is biased toward 0. Our finding of a statistically significant negative effect of approximately 4 percent within 300m of the boundary suggests that indeed disclosure is filling an information gap, which is reflected in differences in house prices.

We investigate how much the price discount that we measure is driven by changes in correlated attributes at the boundary. We regress a house attribute on an indicator for location within a regulated area, controlling for boundary, grid, county-by-year, and month fixed effects and location within an incorporated area; Table 5 presents present the coefficient on *Regulated*. The results give an adjusted average difference in

18 This figure relies on the Halvorsen-Palmquist (1980) correction for the coefficient in Column 6 of Table 3.

observed characteristics between the regulated and unregulated sides. We estimate these regressions for each attribute using different bandwidths so that each cell in Table 5 presents the coefficient and standard error from a separate regression.

Restricting the sample to a narrow bandwidth around the boundary does not eliminate differences in observed attributes between regulated and unregulated areas; however, with the exception of distance to protected areas, which is marginally significantly different between regulated and unregulated areas, estimated differences would likely bias our coefficient of interest toward 0. Wildfire hazard, as measured by WHP, is higher in regulated areas, even after restricting the sample to areas classified as high FHSZ. However, as shown in Table 2, WHP is positively correlated with price, other things equal; therefore, we would expect that higher WHP in regulated areas would positively bias our estimates. Nevertheless, within a neighborhood around the boundary between regulated and unregulated areas, we estimate negative effects of disclosure requirements on home price. A similar argument applies for lot size, which we would also expect to positively impact home prices, and language arts test scores. Additionally, we find differences in WHP at the boundary but not significant differences in the likelihood of being affected by a wildfire event in the last five years (*Within fire*). This helps to limit the price effects being driven by other differences associated with disasters (e.g., a salience or recency bias). Homes in regulated areas are further from protected areas, after controlling for other home attributes, which is contrary to expectations, given that regulated high-FHSZ areas are typically in more rural SRAs.

5.3. Robustness

We next assess the robustness of our estimated effects. Our main estimates focus on *high* FHSZs to limit variation in unobserved heterogeneity while retaining variation in disclosure. We can similarly estimate our effects of interest while focusing on *moderate* FHSZs because properties in SRAs with moderate fire hazard severity are required to disclose risks but those in LRAs are not. Table 6 re-estimates the boundary discontinuity regressions under different bandwidths but for moderate FHSZs. The price discount associated with regulated disclosure is 1–2.6 percent for 200–400m bandwidths, although estimates are not statistically significant.

In light of the evidence that regulated areas coincide with more rural locations, we re-estimate our main boundary discontinuity regressions (with a 0.3km bandwidth) by limiting the sample based on whether the property is located in an incorporated area. We present these results in Table 7 for both *High* and *Moderate* FHSZs. We find that the price discount associated with disclosure is higher when limiting to incorporated areas: prices fall by 9.2 ($p < 0.01$) and 3.7 percent (not statistically significant) for *High* and *Moderate* FHSZs, respectively. Impacts for unincorporated areas are smaller (around -2 percent) but not statistically significant. If the price effects we found earlier were driven by regulated areas coinciding with rural areas, then limiting by incorporation status should attenuate the magnitude of the price effects for all samples.

Our strategy to identify housing price impacts of wildfire risk is based on cross-sectional variation in information disclosure. This strategy lends itself well to investigating the price impacts separately by year, which allows us to recover willingness-to-pay measures that do not require the hedonic equilibrium to be stable over time. Because our sample spans more than six years, changes in population and preferences (for both wildfire risk and other amenities) may mix different hedonic equilibria, which obscures the interpretation of the estimates as a welfare measure (Kuminoff and Pope 2014; Banzhaf 2021). We re-estimate our main results for each year from 2015 to 2021; the results are shown in Table 8 and plotted in Figure 4. Although not all estimates are statistically significant, estimates are generally more precise once we allow for larger bandwidths (0.4km or 0.5km, also shown in Figure 4). Overall, an increase in the magnitude of effects of regulated status on home prices over the study period appears, although differences between coefficients are likely not statistically significant. This downward trend would be consistent with increasing salience of wildfire risk during this period.

5.4. Heterogeneity

Last, we explore geographic heterogeneity in willingness to pay to avoid wildfire risks by estimating our model separately for southern and northern California.[19] Table 9 shows the results. In southern California, regulated status has strong negative effects on house prices at all bandwidths. At 300m, there is a 6 percent reduction in house prices in regulated areas, larger than the effect we find for the state as a whole. All the coefficients for the northern region are smaller (in absolute value) and not significantly different from 0. This may be partly due to the smaller sample size, but also heterogeneity in the high-hazard zones, which cover geographic areas from the wine country counties near the coast to the high Sierras. Southern California high-hazard areas, by contrast, are more homogeneous, mostly in the coastal ranges and not inland (which is primarily desert).

19 We define northern and southern California based on the distinction used by the American Automobile Association. The counties in each region are listed in the footnote to Table 9.

6. Discussion

We use information on home sales in California to estimate the effect of wildfire disclosure on house prices. We address two empirical challenges that arise when attempting to analyze disaster risk impacts in housing markets: (1) risks are positively correlated with amenities, and (2) homeowners may be uninformed when making purchase decisions. We do this by leveraging differences in wildfire risk disclosure requirements established by the state and using a BDD to compare houses with similar spatial amenities. Specifically, we use data on home sales in areas the state has designated as high-hazard zones but only near the boundary between areas where disclosure is required and areas where it is not.

We find that homes where disclosure is required sell for 4.3 percent less, on average, than those just across the boundary. The median value of homes in regulated areas near the regulatory boundary is $557,000, so our results suggest an approximately $23,700 reduction in willingness to pay for high-hazard homes as result of disclosure.

The key identifying assumption in our BDD strategy is that unobserved variables do not vary discontinuously at the regulatory boundary, which is defined jointly by the boundaries between SRAs and LRAs and the California FHSZ boundaries. Unlike other studies, we focus specifically on boundaries between SRA (regulated) and LRA (unregulated) within high FHSZs. We limit the sample to high FHSZs to allay concerns about correlation between different fire risk levels and unobserved amenities. To address remaining differences between SRA and LRA areas within high FHSZs, notably rurality and incorporation status, we adopt two strategies. First, we control for a broad suite of observable property- and neighborhood-specific variables. Second, we collect data on incorporated status, control for its effects on price, and, in robustness tests, estimate effects of disclosure separately for incorporated and unincorporated areas. Some of our observed effects may still be driven by unobservable variables, but most observed variables that appear to differ across the boundary would likely bias our estimated effects upward, toward 0.

The magnitude of our estimates, and how they vary across years and within California, give us some confidence that they reflect homebuyers' attitudes about wildfire hazard rather than other factors. They also suggest that risk disclosure is filling an information gap in the housing market. Our estimates are roughly consistent with those in the (limited) literature. Troy and Romm (2007) use the California Assembly Bill 1195 in 1997, which consolidated wildfire hazard disclosure requirements in the state, and find that homes in areas requiring disclosure sell for 5 percent less if they were near a recent wildfire perimeter. Garnache (2023) uses changes in California FHSZ maps and a repeat sales approach and finds that properties in southern California with newly imposed disclosure requirements experience price declines of 3–6 percent.

Our analysis uses data from across California for a recent period, which allows us to examine temporal and spatial variation in our estimates. We find that the estimated effects increase in magnitude (in absolute value) over the study period, when wildfire frequency and severity were rising. However, we find sizeable and statistically significant impacts in southern California, which appear to be driving our estimates for the state as a whole.

Our results have a number of important policy implications. First, they indicate that availability of information regarding risk may be a factor in determining demand for homes in high-hazard locations. This is consistent with findings for disclosure of flood risks (Pope, 2008). Second, as wildfire activity and development within high-hazard areas both continue to increase across the western United States (Abatzoglou and Williams 2016; Mann et al. 2014; Radeloff et al. 2018), disclosure requirements could help mitigate further increases in exposure to risk. Third, we document heterogeneity in price discounts over time, revealing that homebuyers' concerns about wildfire hazard may be increasing. Rising insurance premiums within high-hazard areas could be contributing to this concern, so an important question for future research is how these changes will shape the future of development and exposure to risk in high-hazard areas.

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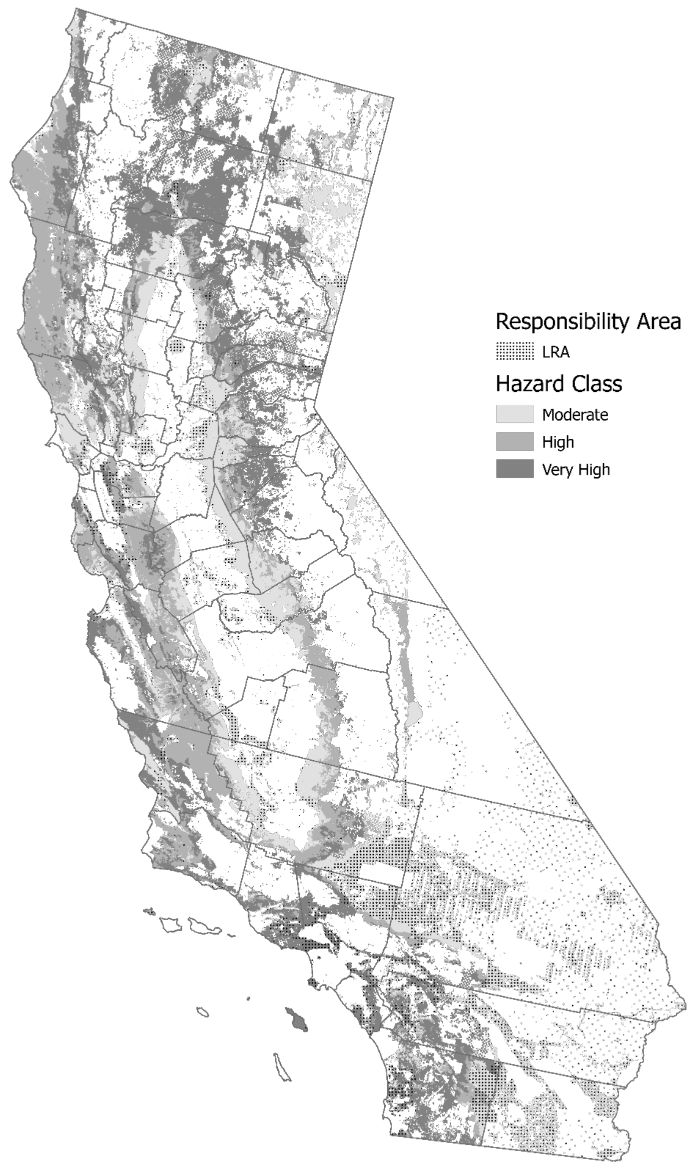
8. Figures and Tables

Figure 1. Fire Hazard Severity Zones (FHSZs) Within California State and Local Responsibility Areas (SRAs and LRAs)

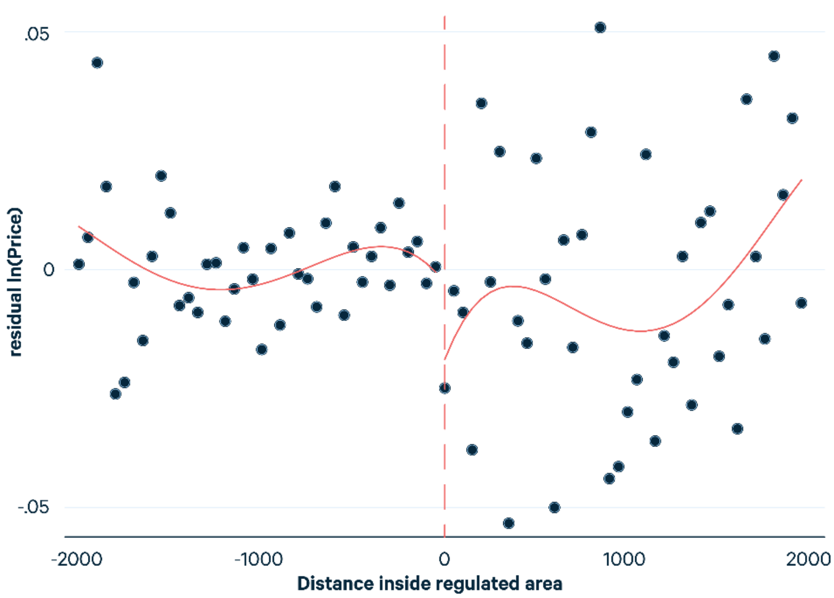


Note: Shaded areas without a stipple pattern are FHSZs within SRAs. Nonshaded areas include areas not classified as FHSZs and FRAs.

Figure 2. Fire Hazard Severity Zones (FHSZs) and Local and State Responsibility Areas (SRAs and LRAs) in San Diego County, California

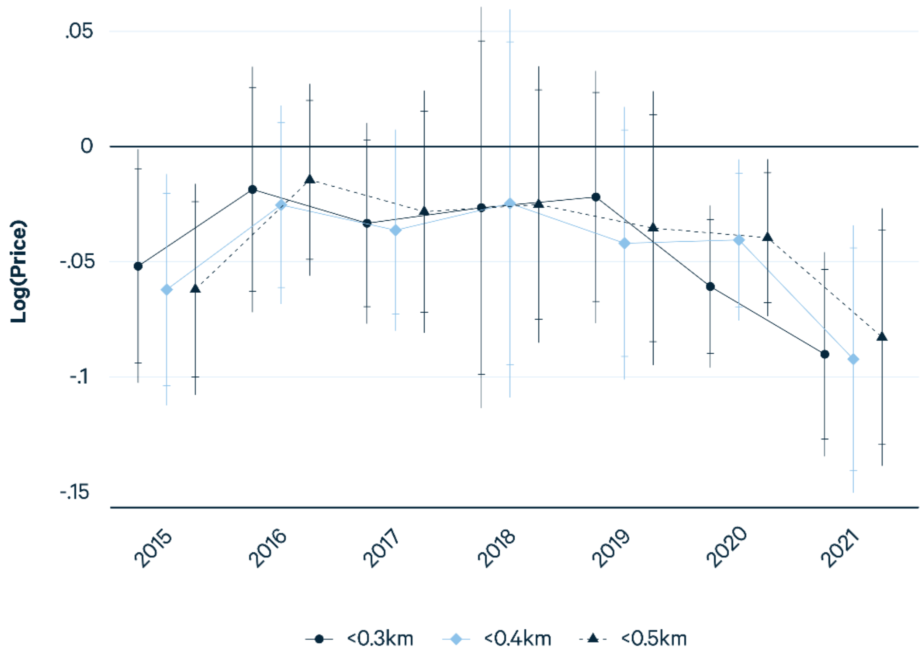
Note: Shaded areas without a stipple pattern are FHSZs within SRAs. Nonshaded areas include areas not classified as FHSZs and FRAs.

Figure 3. Visual Evidence for a Difference in Price Across the Boundary Between Unregulated and Regulated High Fire Hazard Severity Zones (FHSZs)



Note: The figure is a binned scatterplot of residuals from a regression of ln(*price*) on our full suite of property and neighborhood-level control variables, as well as grid cell, county-by-year, and month-of-year fixed effects, for properties within 2km of the boundary. Residuals are averaged within 50m bins. A fourth-degree polynomial is fitted on either side of the boundary.

Figure 4. Boundary Discontinuity Regression Impacts by Year



Note: The figure plots the coefficient on *Regulated* from the boundary discontinuity specification, re-estimated separately for each year and using bandwidths of 0.3km, 0.4km, and 0.5km. All specifications include house and neighborhood controls (see Table 2 notes) and fixed effects for grid and month of sale. All standard errors are clustered at the county level.

Table 1. Responsibility Area and Fire Hazard Severity Zone Categories Where Disclosure Laws Do ("Yes") or Do Not ("No") Apply Under California AB 1195

	Fire Hazard Severity Zone			
Responsibility Area	**None**	**Moderate**	**High**	**Very High**
Local Responsibility Area	No	No	No	Yes
State Responsibility Area	No	Yes	Yes	Yes
Federal Responsibility Area	No	No	No	No

Table 2. Summary Statistics

	Full Sample		Regulated		Not Regulated	
Attribute	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
A. Wildfire Hazard						
Ln(1+WHP)	1.69	2.74	4.13	3.37	1.18	2.28
Previous Fire	0.02	0.14	0.09	0.29	0.01	0.08
B. Property Characteristics						
Price	625,444	846,988	746,907	1,006,942	599,987	807,154
Bedrooms	3.362	0.895	3.28	0.99	3.38	0.87
Bathrooms	2.327	0.85	2.5	1.03	2.29	0.81
Ln(Lot Size)	-1.543	0.96	-0.82	1.4	-1.69	0.76
Year Built	1980.67	24.91	1984.9	22.27	1979	25.34
Sqft	1973.18	7739.74	2245.02	1213.98	1916.21	8492.98
C. Neighborhood Characteristics						
Pct. Meeting Standard – Language Arts	52.15	13.75	54.4	13.98	51.67	13.66
Pct. Meeting Standard – Math	39.22	15.44	41.34	16.3	38.77	15.21
Share White	0.66	0.19	0.8	0.13	0.64	0.18
PAD Distance	17126.2	14398.22	11679.37	9222.43	18267.76	15013.67
Incorporated	0.77	0.42	0.37	0.48	0.86	0.35
Observations	1,566,426		271,413		1,295,013	

Notes: The table presents the mean and standard deviations of various house characteristics for the full sample and also by regulatory status. The period in this sample is 2015–2020.

Table 3. Price Regression Using Wildfire Hazard Potential

Dep. Var.: Log(Price)	Full	Add Cty-by-year FE	Add Tract FE
Log(1+WHP)	-0.00242 (0.00187)	-0.00242 (0.00184)	0.00232** (0.000960)
Observations	1,566,426	1,566,422	1,566,361
R-squared	0.695	0.697	0.780

Notes: The table presents a regression of the log of housing price on house and neighborhood controls and the log of Wildfire Hazard Potential, a measure of risk. Each column represents a separate regression. The baseline regression in Column 1 includes house and neighborhood controls and fixed effects for year and month of sale. Subsequent columns progressively add spatial fixed effects (denoted in the column header). House and neighborhood controls include number of bedrooms, number of bathrooms, log of lot size, age, indicators for the decade of construction, square feet, share of White individuals at the census tract in 2010 Decennial Census, measures of school quality (test scores for English/language arts and math), logged distance to a protected area, and indicators for location within the perimeter of any fire in the last five years and incorporation. All standard errors are two-way clustered at the county and year levels. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4. Price Regression Using Regulatory Status

Dep. Var.: Log(Price)	Full	Limit to High FHSZ	Limit to Built <2008	Add FE Cty-by-year	Add FE Tract	Add FE Grid
Regulated	0.00970 (0.0259)	-0.0565* (0.0260)	-0.0606* (0.0290)	-0.0617* (0.0287)	-0.0328** (0.0133)	-0.0507** (0.0147)
Observations	1,566,426	164,019	141,606	141,597	141,512	141,546
R-squared	0.695	0.701	0.724	0.726	0.798	0.780

Notes: The table presents a regression of the log of housing price on house and neighborhood controls and an indicator for location within a regulated area. The first column begins with the sample of house sales in high Fire Hazard Severity Zones (FHSZs). Subsequent columns either makes additional restrictions on the sample or progressively add spatial fixed effects (denoted in the column header). All specifications include house and neighborhood controls (see Table 2 notes) and fixed effects for year and month of sale. All standard errors are two-way clustered at the county and year levels. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5. Boundary Discontinuity Price Regression, High FHSZ

Dep. Var.: Log(Price)	Boundary Distance				
	10km	**8km**	**4km**	**2km**	**1km**
Regulated	-0.0253* (0.0121)	-0.0267* (0.0121)	-0.0267* (0.0131)	-0.0343* (0.0151)	-0.0402** (0.0154
Observations	139,195	138,052	125,789	98,035	72,967
R-squared	0.799	0.800	0.807	0.815	0.0821
Dep. Var.: Log(Price)	**Boundary Distance**				
	0.75km	**0.5km**	**0.4km**	**0.3km**	**0.2km**
Regulated	-0.0402** (0.0153)	-0.0417** (0.0144)	-0.0455** (0.0160)	-0.0426** (0.0170)	-0.0511** (0.0187)
Observations	64,165	54,033	49,269	43,483	35,039
R-squared	0.821	0.822	0.823	0.825	0.827

Notes: The table presents a regression of the log of housing price on an indicator for location within a regulated area. All specifications include house and neighborhood controls (see Table 2 notes), county-by-year fixed effects, month of sale fixed effects, boundary fixed effects, and grid fixed effects. We narrow the bandwidth from 10km to 200m on either side of the regulatory boundary. All standard errors are two-way clustered at the county and year levels. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6. Variation in Observed Variables Across the Boundary

	High FHSZ, Built <2008	4km	1km	500m	200m
A. Wildfire Risk					
ln(1+WHP)	1.28**	1.19**	1.14**	0.84**	0.48**
	(0.14)	(0.14)	(0.09)	(0.12)	(0.16)
Within Fire	0.01	0.01	0.00	-0.01	-0.01
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
B. Structural Characteristics					
No. of Bedrooms	0.03	0.02	0.03	-0.03	-0.12
	(0.06)	(0.06)	(0.06)	(0.08)	(0.11)
No. of Bathrooms	0.25**	0.24**	0.19**	0.10	0.05
	(0.06)	(0.07)	(0.07)	(0.08)	(0.09)
ln(Sq. Feet)	0.13**	0.12**	0.10*	0.05	0.00
	(0.03)	(0.04)	(0.04)	(0.05)	(0.06)
ln(Lot Size)	0.88**	0.79**	0.63**	0.51**	0.39**
	(0.15)	(0.15)	(0.12)	(0.10)	(0.09)
Year Built	3.42	3.37	3.55+	2.46	0.31
	(2.21)	(2.31)	(1.03)	(2.12)	(1.74)
C. Neighborhood Characteristics					
Pct. Meeting Standard – Language Arts	2.68**	2.39**	1.15*	1.00*	0.91**
	(0.96)	(0.84)	(0.55)	(0.44)	(0.36)
Pct. Meeting Standard – Math	2.60**	2.25**	0.79*	0.63+	0.56
	(1.03)	(0.89)	(0.35)	(0.32)	(0.35)
Share of White Residents	0.03**	0.02**	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
ln(Distance to Protected Areas)	0.04	0.04	0.09+	0.07**	0.06+
	(0.06)	(0.06)	(0.05)	(0.03)	(0.04)
No. of Observations	71406	65864	45996	37204	25317

Notes: The table presents results from regressions of a house attribute on an indicator for location within a regulated area. Coefficients for Regulated are presented, and all other coefficients are omitted; each cell presents the coefficient and standard error for a separate regression. The variables WHP, Sq. Feet, Lot size, and Distance to protected areas are logged. All regressions include boundary, grid, county-by-year, and month of sale fixed effects and a control for location within an incorporated area. All standard errors are two-way clustered at the county and year levels. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7. Boundary Discontinuity Price Regressions, Moderate Fire Hazard Severity Zone (FHSZ)

Dep. Var.: Log(Price)	Boundary Distance				
	10km	**8km**	**4km**	**2km**	**1km**
Regulated	-0.0517 (0.00969)	-0.0160 (0.00984)	-0.0141 (0.0131)	-0.0107 (0.0138)	-0.00532 (0.0170)
Observations	119,038	113,644	94,342	71,224	50,350
R-squared	0.806	0.809	0.817	0.821	0.822

Dep. Var.: Log(Price)	Boundary Distance				
	0.75km	**0.5km**	**0.4km**	**0.3km**	**0.2km**
Regulated	-0.00566 (0.0194)	-0.00999 (0.0198)	-0.0163 (0.0198)	-0.0261 (0.0194)	-0.0150 (0.0212)
Observations	43,817	35,470	30,812	25,023	16,656
R-squared	0.822	0.822	0.821	0.825	0.821

Notes: The table presents a regression of the log of housing price on an indicator for location within a regulated area. The sample includes all sales in a moderate FHSZ. All specifications include house and neighborhood controls (see Table 2 notes), county-by-year fixed effects, month of sale fixed effects, boundary fixed effects and grid fixed effects. We narrow the bandwidth from 10km to 300m on either side of the regulatory boundary. All standard errors are two-way clustered at the county and year levels. Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 8. Robustness of Estimates to Incorporated Status

	High FHSZ (Boundary <0.3km)		
Dep. Var.: Log(Price)	**Baseline**	**Incorp.**	**Un-Incorp.**
Regulated	-0.0426** (0.0170)	-0.0964*** (0.0240)	-0.0161 (0.0205)
Observations	43,483	30,800	12,651
R-squared	0.825	0.828	0.831
	Moderate FHSZ (Boundary <0.3km)		
Dep. Var.: Log(Price)	**Baseline**	**Incorp.**	**Un-incorp.**
Regulated	-0.0261 (0.0194)	-0.0379 (0.0253)	-0.0208 (0.0210)
Observations	25,023	15,460	9,511
R-squared	0.825	0.834	0.820

Notes: The table reproduces the main boundary discontinuity estimates using a bandwidth of 300m (Baseline) for high and moderate Fire Hazard Severity Zones and then re-estimates the specification by limiting to incorporated or unincorporated areas only. All standard errors are two-way clustered at the county and year level. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9. Boundary Discontinuity Price Regressions by Year

	Bandwidth: 0.3k						
Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Regulated	-0.0519** (0.0249)	-0.0186 (0.0262)	-0.0333 (0.0213)	-0.0265 (0.0427)	-0.0219 (0.0266)	-0.0607*** (0.0170)	-0.0901*** (0.0215)
Observations	7,292	7,112	6,988	5,474	4,658	4,666	5,569
R-squared	0.843	0.812	0.812	0.832	0.859	0.844	0.850
	Bandwidth: 0.4k						
Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Regulated	-0.0621** (0.0247)	-0.0253 (0.0212)	-0.0363 (0.0214)	-0.0247 (0.0415)	-0.0419 (0.0289)	-0.0405** (0.0170)	-0.0922*** (0.0283)
Observations	8,302	8,099	7,934	6,194	5,268	5,280	6,307
R-squared	0.843	0.810	0.808	0.829	0.860	0.843	0.843
	Bandwidth: 0.5k						
Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Regulated	-0.0621** (0.0247)	-0.0253 (0.0212)	-0.0363 (0.0214)	-0.0247 (0.0415)	-0.0419 (0.0289)	-0.0405** (0.0170)	-0.0922*** (0.0283)
Observations	8,302	8,099	7,934	6,194	5,268	5,280	6,307
R-squared	0.843	0.810	0.808	0.829	0.860	0.843	0.843

Notes: The table presents boundary discontinuity specifications re-estimated separately for each year and using bandwidths of 0.3km, 0.4km, and 0.5km. All specifications include house and neighborhood controls (see Table 2 notes) and fixed effects for grid, boundary, and month of sale. All standard errors are clustered at the county level. Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.H2

Table 10. Price Effects by Region

Dep. Var.: Log(Price)	Region: S. California				
	10km	**5km**	**1km**	**0.5km**	**0.3km**
Regulated	-0.0477** (0.0179)	-0.0496** (0.0179)	-0.0523** (0.0197)	-0.0544*** (0.0150)	-0.0631*** (0.0162)
Observations	89,526	87,679	53,075	40,287	32,893
Dep. Var.: Log(Price)	**Region: N. California**				
	10km	**5km**	**1km**	**0.5km**	**0.3km**
Regulated	-0.00729 (0.0187)	-0.00308 (0.0194)	-0.0229 (0.0221)	-0.0125 (0.0245)	0.00241 (0.0257)
Observations	49,668	44,116	19,892	13,746	10,590

Notes: The table presents a regression of the log of housing price on an indicator for location within a regulated area for northern versus southern California. Southern California consists of counties south of Monterey County and in the eastern Sierras south of Alpine County: Inyo, Imperial, Kern, Los Angeles, Mono, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, Tulare, and Ventura. All other counties are considered northern. All specifications include house and neighborhood controls (see Table 2 notes) and county-by-year, month of sale, boundary, and grid fixed effects. All standard errors are two-way clustered at the county and year levels. Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.