2024 Catastrophic risk premium subsidization analysis for National Association of REALTORS®

Commissioned by the National Association of REALTORS®

Rehan Siddique, FCAS, MAAA, Actuary
Nancy Watkins, FCAS, MAAA, Principal and Consulting Actuary
Matt Chamberlain, FCAS, MAAA, Principal and Consulting Actuary

Executive Summary

PURPOSE OF REPORT

The National Association of REALTORS® (NAR) is a trade association representing REALTORS® in the United States. It is the country's largest trade association and one of its largest lobbying groups. NAR engaged Milliman, one of the world's largest independent actuarial consulting firms, to assist in the evaluation of whether NAR should support a federal all-natural-catastrophe-perils (All CAT Perils) insurance mandate and to determine the magnitude of the cross-subsidization that would exist between states if a single rate were to be charged for natural perils catastrophe (cat) risk.

NAR is evaluating an All CAT Perils program to understand whether the cost to homeowners of insuring for natural disasters could be decreased by mandating, and possibly cross-subsidizing, coverage across a large pool of insureds and perils. This white paper contains a limited update to a previous study[1] Milliman prepared for NAR in 2020, reflecting adjusted data and updated methodologies.

This executive summary contains a discussion of the project scope and key findings, followed by a summary of selected alternative versions of an All CAT Perils program, and ends with a closing discussion summarizing the results. The appendix of this report provides a more in-depth description of the data, methods, and assumptions underlying these results, as well as exhibits that document the calculations within.

SCOPE OF ANALYSIS

The scope of this analysis is to evaluate the cost of an All CAT Perils mandate and the degree of cross-subsidization that would be created if there were a mandate to offer catastrophe coverage to all homeowners at the same rate.

At NAR's request, catastrophe exposure is defined as hurricane wind, earthquake (shake only), flood (both inland flood and storm surge), severe convective storm (tornado, hail, and catastrophic straight-line wind), and wildfire; it excludes all other perils. The analysis includes single-family owner-occupied homes in the United States, and excludes homes in Alaska, the District of Columbia, Hawaii, and territories of the United States. Any reference to "countrywide" in this report reflects this list of included states.

Estimated average premiums by state and countrywide are developed using average annual losses (AALs) by CAT peril and expense assumptions based on insurance industry financial data. AALs are calculated using catastrophe models for a countrywide set of representative homes with coverages typical of a homeowners insurance policy. Updated AALs since the 2020 report were not derived by rerunning the relevant catastrophe models; instead, appropriate adjustments were made to the prior study AALs and exposures to account for changes in replacement cost.

Other revisions performed in this report versus the prior analysis include updating the take up rate methodology to rely on 2023 OpenFEMA data to better assess the proportion of people who would purchase a flood insurance policy in current market conditions, updating expense/reinsurance assumptions based on more recent industry data, updating census information to reflect the release of the 2020 US Census, and estimating National Flood Insurance Program (NFIP) premiums at full coverage limits based on publicly available data based on a more up to date version of the program's rating plan. Premium subsidies are calculated assuming one rate for the amount of coverage A[2] purchased for the entire country, and then comparing it to the estimated average premium for the state.

KEY FINDINGS

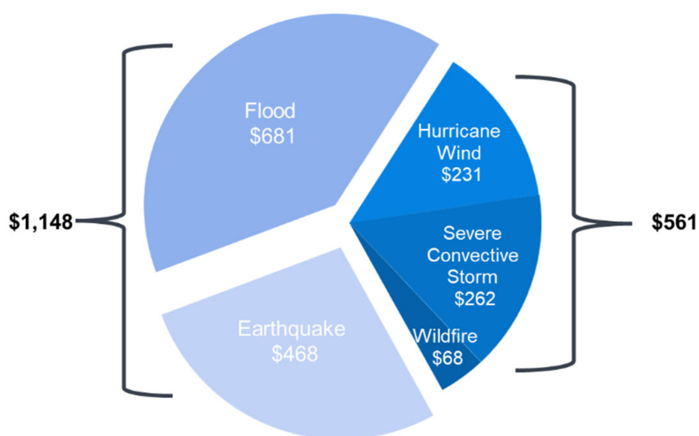
The estimated cost of insuring all single-family owner-occupied homes countrywide is $122.5 billion annually, or $1,709 per each

[1] The prior report can be found on the NAR website at https://www.nar.realtor/insurance/flood-insurance/nar-brief-natural-catastrophe-perils-insurance
[2] The coverage A is the amount of insurance purchased for the replacement cost of the dwelling.

home insured, for all CAT perils combined. Figure 1 shows the average countrywide premium breakdown by peril.

The perils of wildfire, severe convective storm, and hurricane wind are all typically covered by homeowners insurance policies today. This means that if an All CAT Perils program were created, some of the cost for the program could be offset given that these perils would no longer be covered by homeowners policies. However, the inclusion of earthquake and flood coverage would significantly increase the total insurance costs for homeowners, as these are the two most expensive perils to insure on a countrywide basis.

FIGURE 1: AVERAGE COUNTRYWIDE PREMIUM BREAKDOWN



An alternative to an All CAT Perils program would be to only mandate flood and earthquake insurance, as they are the only perils in this study that are mostly uninsured by homeowners today. The estimated total premiums required to insure flood and earthquake for all single-family owner-occupied homes totals $82.3 billion annually, or an average of $1,148 for each home insured. A mandatory program for flood and earthquake only would not be significantly offset by a decrease in other insurance costs for most homes in our study, because most homeowners do not have coverage for these perils today.

Figures 2A and 2B show the impact of this alternative on an unsubsidized basis, compared to estimates of current NFIP premium purchased (assuming full replacement cost coverage).

The 97% of homeowners who do not have an NFIP policy would pay an average of $716 more in annual premiums under this scenario. An additional 1% of homeowners who already have an NFIP policy would pay much more, with an average increase ranging from $7,469 to $8,622 more in annual premiums. This results in an average premium increase for 98% of homeowners by approximately $748. However, 2% of homeowners would pay less for flood and earthquake coverage than for their current NFIP policies today.

When interpreting Figures 2A and 2B, there are additional items that must be considered. First, to the extent that homeowners have earthquake insurance or private (non-NFIP) flood insurance already, they may see a smaller cost increase, or larger cost decrease, than shown in Figures 2A and 2B, which only considers NFIP premiums. However, the earthquake peril is often uninsured today and private flood insurance policies are significantly less common than NFIP policies. Second, the flood and earthquake premiums developed in our analysis assume full coverage like a homeowners policy, which is often more coverage than provided under the NFIP today. They also do not consider the "glide path" of rate increases present in NFIP today nor any minimum premium threshold. In order to provide a more appropriate comparison, we have also assumed full limits coverage and full risk premiums for the NFIP premium estimates. Further discussion on the determination of the NFIP premium estimates can be found in the "NFIP Premium Estimates" section below.

FIGURE 2A: CHANGE IN PREMIUM BY MANDATING FLOOD AND EARTHQUAKE COVERAGE WITHOUT SUBSIDIZATION, COMPARED TO CURRENT NFIP PREMIUMS

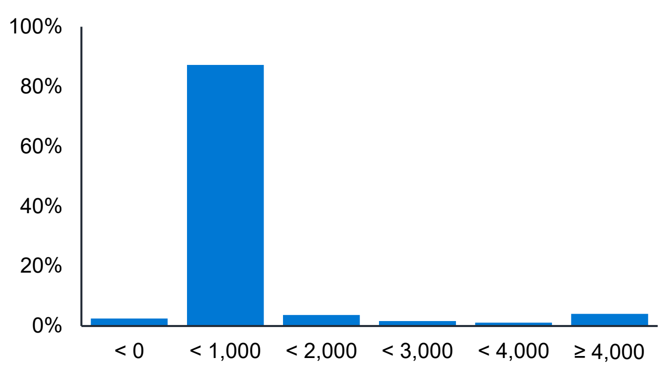


FIGURE 2B: CHANGE IN PREMIUM BY MANDATING FLOOD AND EARTHQUAKE COVERAGE WITHOUT SUBSIDIZATION, COMPARED TO CURRENT NFIP PREMIUMS: TOP 4 MOST SUBSIDIZED STATES

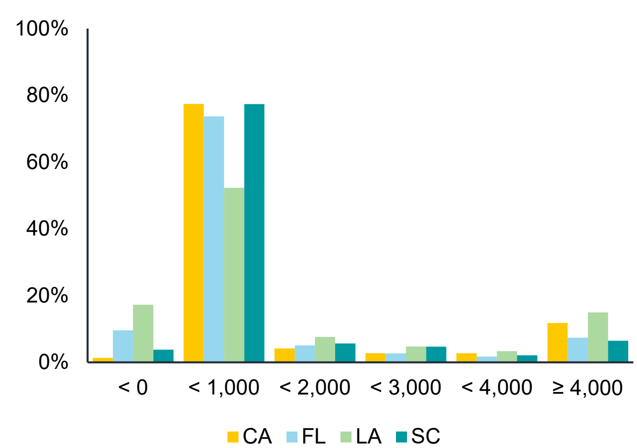


Figure 3A below compares the costs of mandating flood and earthquake insurance in an unsubsidized versus subsidized manner for the 5 top and bottom most subsidized states. The current average homeowners premium[3] for each state is shown for comparison with the flood and earthquake premiums. The subsidized scenario includes charging a single rate per coverage amount countrywide. In total, subsidization raises the average flood and earthquake premium charged for 38 states and decreases the average for 10. California, Louisiana, Florida and South Carolina would have the largest reductions in average flood and earthquake premium in a subsidized versus an unsubsidized scenario. Rhode Island and Massachusetts would have the largest increases, representing over $1,100 additional average premium per household per year. Under such a program, every homeowner would receive increased coverage compared to the current situation where standard homeowners policies do not cover flood and earthquake losses. While there is a societal benefit to closing this coverage gap against flood and earthquake across the country, there is a significant cost associated with it. For data regarding the remaining states not shown in Figure 3A, refer to the exhibits at the end of this report. Figure 3B shows the same information as Figure 3A but restates the data to emphasize this cost as the change in premium burden the average homeowner would face in each state. Refer to the appendix to see this data displayed in a map for the 48 contiguous states.

FIGURE 3A: IMPACT OF MANDATING FLOOD AND EARTHQUAKE COVERAGE WITH AND WITHOUT SUBSIDIZATION: FIVE TOP AND BOTTOM MOST SUBSIDIZED STATES

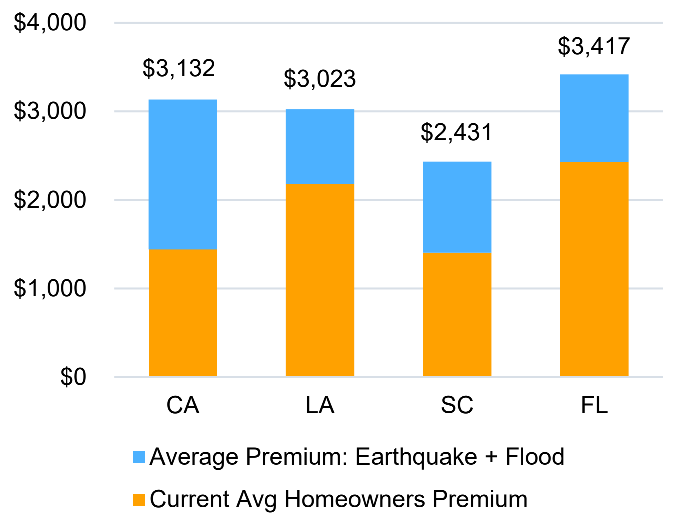
		Unsubsidized		Subsidized		
State	Current Avg Homeowners Premium	Average Premium: Earthquake + Flood	Average Premium Change (%)	Average Premium: Earthquake + Flood	Average Premium Change (%)	Subsidy received (paid)
CA	$1,441	$4,791	333%	$1,691	117%	$3,100
LA	2,178	2,560	118%	845	39%	1,715
SC	1,404	2,117	151%	1,027	73%	1,090
FL	2,431	2,062	85%	986	41%	1,076
ME	990	1,683	170%	1,236	125%	448
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
CO	1,897	482	25%	1,315	69%	(833)
MN	1,635	250	15%	1,084	66%	(834)
MD	1,223	261	21%	1,198	98%	(937)
MA	1,711	572	33%	1,675	98%	(1,102)
RI	1,855	333	18%	1,454	78%	(1,122)
Total All States	$1,427	$1,148	80.4%	$1,148	80.4%	$0

[3] Average Homeowners Premium from National Association of Insurance Commissioners (2023). Dwelling Fire, Homeowners Owner-Occupied, and Homeowners Tenant and Condominium/Cooperative Unit Owner's Insurance Report: Data for 2021, Table 4.

FIGURE 3B: CHANGE IN AVERAGE HOMEOWNER PREMIUM BURDEN AFTER MANDATING SUBSIDIZED FLOOD AND EARTHQUAKE COVERAGE - SORTED BY SUBSIDY AMOUNT

State	Current Avg Homeowners Premium	Homeowners Premium + Subsidized Flood and EQ Premium	Change in Premium Burden to Homeowners
CA	$1,441	$3,132	117.4%
LA	2,178	3,023	38.8%
SC	1,404	2,431	73.2%
FL	2,431	3,417	40.5%
ME	990	2,226	124.8%
TX	2,092	3,111	48.7%
WA	1,029	2,391	132.3%
UT	842	1,977	134.7%
OR	820	1,917	133.8%
VT	1,038	2,189	110.9%
WV	974	1,849	89.8%
MS	1,740	2,460	41.4%
WY	1,512	2,704	78.8%
MT	1,521	2,577	69.4%
AR	1,575	2,363	50.0%
NH	1,095	2,278	108.0%
NV	898	2,098	133.6%
TN	1,342	2,268	69.0%
KY	1,196	2,014	68.4%
NC	1,143	2,121	85.6%
AL	1,571	2,432	54.8%
OK	2,024	2,829	39.8%
ID	911	1,953	114.4%
SD	1,299	2,193	68.8%
NM	1,242	2,207	77.7%
PA	976	2,069	112.0%
DE	990	2,220	124.3%
ND	1,295	2,242	73.2%
MO	1,388	2,393	72.4%
IN	1,086	2,003	84.4%
GA	1,435	2,467	71.9%
IA	1,061	1,972	85.9%
NE	1,686	2,525	49.8%
KS	1,563	2,512	60.7%
NJ	1,332	2,939	120.7%
AZ	945	2,024	114.2%
VA	1,171	2,273	94.1%
NY	1,456	2,911	99.9%
OH	933	1,913	105.0%
MI	1,029	2,043	98.5%
CT	1,689	3,395	101.0%
WI	806	1,854	130.0%
IL	1,238	2,417	95.3%
CO	1,897	3,212	69.3%
MN	1,635	2,719	66.3%
MD	1,223	2,421	97.9%
MA	1,711	3,386	97.9%
RI	1,855	3,309	78.4%
Total	$1,427	$2,576	80.4%

FIGURE 3C: CHANGE IN AVERAGE HOMEOWNER PREMIUM BURDEN AFTER MANDATING SUBSIDIZED FLOOD AND EARTHQUAKE COVERAGE: TOP 4 MOST SUBSIDIZED STATES



Figures 3C and 3D further emphasize the fact that nearly all homeowners would receive an increase in their premium burden. The states shown in Figure 3C represent the top four subsidized states under this scenario. Yet even in these states, the average homeowner can expect an increase. In fact, 16 out of the 48 states analyzed would expect their average premium burden to at least double if mandated to purchase a subsidized flood and earthquake insurance product.

FIGURE 3D: CHANGE IN COUNTRYWIDE AVERAGE HOMEOWNER PREMIUM BURDEN

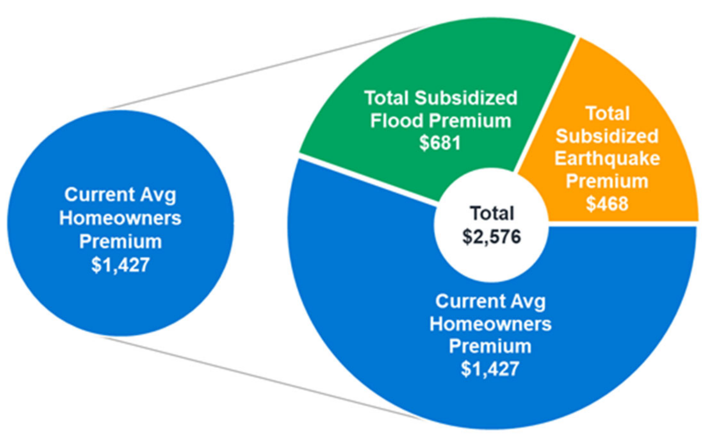


Figure 3D provides the same view but at the countrywide level. We see that while the homeowners premium will remain constant, the average homeowner across the country would receive a significant increase in their overall premium burden.

As shown in Figure 4, 37 states would subsidize 11 remaining states in an All CAT Perils mandate where all single-family homeowners pay the same rate.

FIGURE 4: ALL CAT PERILS PREMIUM SUBSIDIES BY STATE

	Average All CAT Perils Premium		
State	Unsubsidized	Subsidized	Subsidy received (paid)
LA	$4,116	$1,258	$2,858
CA	5,152	2,518	2,634
FL	3,600	1,467	2,132
SC	2,994	1,529	1,464
TX	2,448	1,518	931
OK	1,613	1,198	415
WY	2,091	1,774	318
KS	1,725	1,412	312
MS	1,338	1,073	266
UT	1,896	1,689	207
ME	1,902	1,839	62
AR	1,131	1,173	(42)
AL	1,155	1,281	(126)
NE	1,121	1,249	(129)
TN	1,074	1,379	(305)
WV	988	1,302	(314)
ID	1,205	1,551	(347)
KY	861	1,218	(357)
MT	1,213	1,571	(359)
NC	1,083	1,456	(373)
WA	1,629	2,027	(398)
OR	1,233	1,633	(399)
SD	929	1,330	(401)
MO	1,083	1,496	(412)
NM	1,012	1,437	(426)
CO	1,498	1,957	(459)
VT	1,235	1,714	(479)
IA	849	1,357	(508)
ND	845	1,410	(565)
NV	1,183	1,786	(603)
IN	674	1,365	(691)
MN	873	1,613	(740)
NH	1,020	1,760	(741)
AZ	843	1,607	(764)
GA	769	1,536	(767)
DE	871	1,831	(960)
RI	1,187	2,165	(978)
VA	661	1,641	(980)
OH	476	1,458	(982)
PA	630	1,627	(997)
NY	1,139	2,166	(1,027)
WI	509	1,560	(1,051)
IL	701	1,755	(1,055)
MI	387	1,509	(1,122)
NJ	1,250	2,392	(1,142)
CT	1,343	2,539	(1,196)
MD	457	1,783	(1,326)
MA	1,114	2,493	(1,379)

The “subsidies” we are referring to in this analysis refer to a comparison of two scenarios: the estimated premium to cover all CAT perils under the current framework and the hypothetical premium in a world where all homeowners are mandated by the federal government to purchase an All CAT Perils insurance product. This does not necessarily mean that a subsidy would decrease a homeowner’s premium obligation for full coverage by the amount of the subsidy received. For example, Figure 4 indicates that the average Californian homeowner would receive a “subsidy” of $2,634. A direct decrease in premium would only come to fruition for a homeowner already paying for insurance for all of the relevant CAT perils and would only occur if all homeowners in the country were mandated to purchase this hypothetical All CAT Perils product. Even if that were to occur, understanding the non-CAT portion of the homeowners insurance premium would be crucial in determining the true change in overall premium burden on the average homeowner. Accounting for this change in average homeowners insurance premium is outside the scope of this analysis.

Regardless of subsidization, an All CAT Perils program would be expected to pay out about half of its claims to just four states, as shown in Figure 5A. The differing size of CAT losses across the country is why the subsidization scenarios tend to result in a few states being subsidized by many others. Further driving this point, we can see the disproportionate effect the catastrophic losses in these four states have relative to their share of the total coverage A in the country. While their catastrophe losses make up about 51% of the country’s total, they only constitute about 27% of the total coverage A, as shown in Figure 5B.

FIGURE 5A: EXPECTED CAT LOSSES PAID: HIGHEST FOUR STATES COMPARED TO THE REMAINDER OF THE COUNTRY

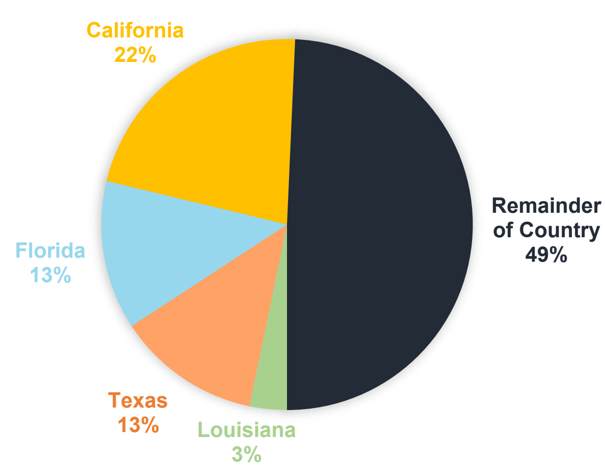
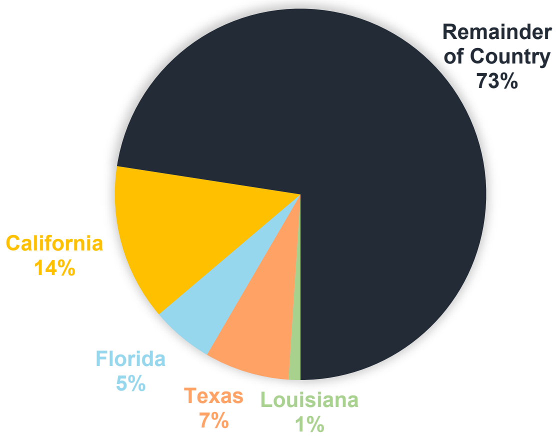


FIGURE 5B: ESTIMATED TOTAL COVERAGE A: HIGHEST FOUR STATES COMPARED TO THE REMAINDER OF THE COUNTRY



Further alternatives

The above analysis discussed both a mandatory All CAT Perils option, and a mandatory flood and earthquake coverage option. Figure 6 evaluates additional options based on various combinations of perils; it shows total cost, cost per single-family owner-occupied home, and cost per person. The cost per single-family owner-occupied home is presented to evaluate the average cost of the program for those insured. NAR also requested a review of financing scenarios that spread the cost across a broader base than those receiving insurance benefits. The cost per person metric represents the most that the cost of a catastrophe insurance program can be spread, by dividing the total cost across the entire population of the United States.

FIGURE 6: RANGE OF COSTS BY PERIL

Peril(s) Insured	Total Cost ($B)	Cost per Single-Family Owner-Occupied Home	Cost per Person
Wildfire	$4.8	$68	$15
Hurricane Wind	16.6	$231	$51
Severe Conv. Storm	18.8	$262	$57
Earthquake	33.5	$468	$102
Flood	48.8	$681	$149
Flood and Earthquake	82.3	$1,148	$251
All CAT Perils	122.5	$1,709	$373

Additional Implications

Implementation of an All CAT Perils program would require a significant amount of total annual funding, estimated as $122.5 billion of premiums in this report, which would amount to $1,709 per home insured. Further, our analysis only covers single-family owner-occupied homes. Providing coverage for other residential properties (such as condominiums, apartments, townhomes, and multifamily units) would require a higher amount of total annual funding.

If an All CAT Perils insurance program were implemented, on average, single-family owner-occupied homeowners would see homeowners premiums decrease to cover those costs. However, the cost of flood and earthquake insurance would mostly be an additional expense as most homeowners are uninsured for these perils today. Flood and earthquake are also the most expensive risks to insure within this study, costing a combined $1,148 per home insured.

Scenarios explored in this paper show that cross-subsidization, whether for an All CAT Perils program or a flood and earthquake-only program, would create significant subsidies due to the uneven distribution in expected catastrophic costs across states.

Considerations

As we have shown in this report, a great degree of subsidization would occur if the program were based on flat rate per $1,000 of coverage. To minimize the risk of cross-subsidization, a much more sophisticated rating plan would need to be constructed: one that is based on geographic factors, property characteristics, weather patterns, property characteristics, and an adequate accounting of expenses. Reinsurance placement would be crucial to the viability of such a program. The costs associated with administration of this program would also be significant, given that this would be one of the largest property insurance programs in history.

A government-run insurance program may also discourage private insurers from offering coverage for catastrophic perils, reducing competition and potentially eliminating the beneficial effect on affordability and consumer choice that occurs when there are multiple views of risk.

In addition to the complexity of the program itself, providing All CAT Perils coverage to every homeowner in America may decrease their incentive to take precautionary measures to mitigate risk, especially if the guaranteed coverage offered through the government is available at a subsidized rate in order to reduce premiums for high-risk policies. This could lead to increased risk-seeking behavior, greater damage to lives and property, and potentially higher cost to the system versus what would otherwise occur under the status quo. This may also encourage further development of new construction in high risk areas such as in the Wildland Urban Interface (WUI) or in coastal areas.

Finally, there must be consideration for political challenges. While actuarially sound government insurance programs can exist, if political interventions result in rates that are not actuarially sound, they could impact the solvency of the program.

Appendix: Methodology and Exhibits

AAL AND ESTIMATED AVERAGE PREMIUM

AALs were calculated for each sample risk in a market basket by running the market baskets through catastrophe models. A market basket is a portfolio of hypothetical risks with a realistic distribution of the characteristics used for insurance pricing and underwriting. The locations for each risk are the actual locations of real risks in the marketplace, as well as certain characteristics of those risks. Other characteristics not specified were set to “unknown” in the catastrophe models. The catastrophe models typically treat “unknown” characteristics as a weighted average of possible values for those characteristics. The market basket utilized in the prior report will be referred to as the “modelling dataset” for the remainder of this report.

For each of the 48 states modeled, we utilized catastrophe model output obtained from the Risk Management Solutions (RMS) version 17.0 earthquake (shake only), hurricane, and severe convective storm models and KatRisk storm surge and inland flood models. RMS event sets used were stochastic event rates (time-dependent) for earthquake, long-term rates for hurricane, and high and low frequency for severe convective storm. The RMS hurricane model was used to calculate RMS storm surge, calculated as hurricane with storm surge less hurricane wind. All RMS AALs were calculated with demand surge, which represents the increased cost to rebuild after a catastrophic event. Storm surge was the only peril where results from both RMS and KatRisk were obtained, and we selected an average of the results from each model for this analysis. We also used wildfire AALs from CoreLogic’s Risk Quantification and Engineering (RQE) 19.2 wildfire model where available, which includes 14 of the highest-risk states in the United States.

Estimated average premiums were developed using AALs from the catastrophe model output mentioned above, and expense and reinsurance assumptions from insurance industry financial statements. Please see the discussion of Exhibit 5 below for more details.

For this report, CAT model output was not refreshed using the latest versions of the models. If this analysis were to be re-created using the latest CAT models, there may be varying results. The industry standard for CAT modelling is to determine damage ratios, which combine the replacement cost and AAL into a single ratio. By applying an identical adjustment factor to both values, we can ensure consistency in the model output while also updating the results to be in line with current market conditions.

In order to maintain consistency between reports, the same exposure set and CAT model output were used with adjustments made to the amount of insurance and AALs. In order to account for the change in average amount of insurance, Milliman performed an analysis of the change in amount of insurance between the modelling dataset used in the prior report and the 2022 Milliman Market Basket. Refer to Exhibit 6, Page 1 for the state-level summary of average adjustment factors implemented within each state. Given the granularity of this analysis, Exhibit 6 does not show each county-level adjustment factor that was ultimately used in the analysis.

MARKET BASKETS

We developed our market baskets based on a random sample of single-family residential parcels obtained from a data vendor. The sample represents approximately 10% of all single-family residences in the study area based on census estimates of owner-occupied one-unit residences, but the sampling percentage may vary by state.

We used the parcel data categories of year built, living area, and number of stories where we found the data to be reasonable. Otherwise unknown values from each modeler were used for these distributions.

To obtain the coverage A for each location, we adjusted an estimate of the value of the property obtained from parcel data based on the state’s actual distribution of coverage A, as obtained from the National Association of Insurance Commissioners (NAIC) report “Dwelling Fire, Homeowners Owner-Occupied, and Homeowners Tenant and Condominium/Cooperative Unit Owner’s Insurance Report: Data for 2021.”

Limits for other structures (coverage B), contents (coverage C), and loss of use (coverage D) were selected as 10%, 50%, and 20% of building limits, respectively. These limits are common base coverage options for homeowners policies. A single deductible of 1% of the building limit was also selected. These selections are not always typical for each peril. For example, earthquake policies usually have much higher deductibles in California. Similarly, wind/hail deductibles in Florida tend to be higher than 1% as well. The selections were made assuming consistent coverages across perils for a national catastrophe program.

Estimates of which homes have NFIP policies were derived by overlaying the market basket with NFIP take-up rates derived from OpenFEMA data as of 2023.

NFIP PREMIUM ESTIMATES

In 2021, the NFIP launched a groundbreaking overhaul to its risk assessment and premium calculation methodology. Unlike the old system's generalized risk zones, the NFIP now assesses each property individually, considering factors like geographic variables, property characteristics, and mitigation efforts. Premiums are now directly linked to the actual risk a property faces, ensuring a more accurate reflection of potential losses. FEMA provides policyholders with a detailed breakdown of their premium calculations, promoting transparency and a better understanding of their flood risk.

This overhaul relied on advanced catastrophe models, modern technology, and actuarial science which results in more precise risk assessments for individual properties.

For purposes of both this report and our prior 2020 study, our estimates of NFIP premiums rely strictly on publicly available data and rating information available through FEMA's website. Assumptions were made to impute necessary rating variables in the modelling dataset that were not available in the prior report, and to allow for ease of comparison between datasets. In order to duplicate realistic distributions of these rating characteristics, univariate distributions of the variables below were determined by state. A random sampling procedure was then used to impute values based on those state distributions.

Variable	Distribution Source
Construction	2022 Milliman Market Basket
Foundation	2022 Milliman Market Basket
Building Deductible	OpenFEMA Data
Contents Deductible	OpenFEMA Data

In addition to the random sampling procedure described above, we have also elected to exclude the caps on limits and replacement cost present in the current NFIP framework. This results in an estimate of NFIP premium at full limits and full insured-to-value ratios. The NFIP rating methodology was built with these caps on limits and insured-to-value ratios in mind. If the NFIP eliminated these caps, it would result in different rating factors to account for the change in risk profile. It is not possible to know how the NFIP would rate full limits policies if Congress authorized the issuance of such policies. It is likely they would be rated differently than we have assumed in this analysis and such differences could materially affect our conclusions.

The information in Figures 2A and 2B shows estimates based on River Class F, which represents a "central" level of risk among possible River Classes. Due to the proprietary nature of River Class assignments within the actual NFIP premium calculation, it is impossible to determine the assignment a property would receive when an NFIP premium is quoted using only publicly available data. The average premium increases in Figures 2A and 2B would vary significantly across River Classes. In reality, there would be a mix of river classes present in the data, which would also shift the total average premiums for the program. Due to the significant variation in NFIP premium estimates due to River Class assignment, relying on different assumed River Class assignments may alter the conclusions of this analysis.

EXHIBIT 1: PREMIUM SUBSIDY BY STATE AND PERIL

Exhibit 1 calculates the premium subsidy by state and peril. The premium subsidy for each state/peril combination is calculated as the difference between the subsidized premium from Exhibit 2 and the unsubsidized average premium from Exhibit 3.

A positive value indicates homeowners in that state would receive a subsidy for that peril. Conversely, a negative value indicates homeowners in the state would pay a subsidy for that peril.

The perils analyzed are shown both separately and grouped together for certain combinations (i.e., All CAT Perils, flood peril only, and earthquake and flood combined).

EXHIBIT 2: COVERAGE A ADJUSTED SUBSIDIZED PREMIUM BY STATE AND PERIL

Exhibit 2 calculates the countrywide estimated rate per $1,000 of coverage A by dividing the estimated average premium by the average countrywide coverage A divided by $1,000, as displayed in the bottom row of the exhibit. The countrywide rate by peril is applied to the average coverage A for each state to determine each state's subsidized premium. We chose this formula so that the premium is based on a common rate for the amount of coverage purchased. For example, a policy with $400,000 of coverage A would cost twice the premium of a policy with $200,000 of coverage A.

EXHIBIT 3: ESTIMATED AVERAGE UNSUBSIDIZED PREMIUM BY STATE AND PERIL

Exhibit 3 combines the AALs from Exhibit 4 with the expenses, reinsurance loads, and profit loads from Exhibit 5, to determine the average unsubsidized premium by state and peril. This premium represents the full risk-to-value premium, without consideration to potential policy limits.

EXHIBIT 4: AVERAGE LOSS AND TOTAL AVERAGE ANNUAL LOSS BY STATE AND PERIL

Exhibit 4 displays the modeled AALs produced by the CAT models by state and peril, adjusted for their corresponding county-level adjustment factors to bring them to 2022 levels.

EXHIBIT 5: EXPENSE, PROFIT, AND REINSURANCE SUMMARY

We used the four largest homeowners insurers by direct written premium in the United States to determine the expenses used in the development of premium by state. The expenses calculated on page 1 are:

- Commission and brokerage: Percentage of premium paid to agents and brokers for the sale of policies.

- Other acquisition: Expenses other than commissions and brokerage expenses paid to acquire business.
- General: Includes the remaining expenses associated with the insurance operations and any other miscellaneous costs.
- Taxes, licenses, and fees: Includes all taxes and miscellaneous fees paid by the insurer excluding federal income taxes (i.e., state premium taxes and licensing fees).
- Other expenses: Includes other miscellaneous expenses of the insurer.
- Loss adjustment expenses: Includes expenses paid by the insurer for the settlement of claims.

Reinsurance expenses have also been included because most private insurance companies purchase reinsurance. The NFIP also purchases reinsurance to manage its exposure to CAT losses. Reinsurance cost depends on many things, including the perils covered, the attachment point and limits, the distribution of risks, and other terms and conditions of the contracts. We reviewed rate filings to select reinsurance costs reflective of industry costs to insure CAT risk. We assumed that reinsurance premium as percentage of premium does not vary by state. In reality, reinsurance premium will be a higher percentage of premium in states with higher probable maximum losses. For the severe convective storm and wildfire perils, reinsurance cost information specific to these perils is often limited in availability. We have made selections for these perils to reflect some level of reinsurance cost those insurers likely bear, but the true estimate may be different. Including reinsurance costs in the severe convective storm and wildfire premium estimates is also new for this analysis. Given the recent historic events for these perils in the last 4 years, reinsurance costs for these perils are becoming more significant.

The actual expenses incurred by an All CAT Perils or other program discussed in this paper would depend on how it is administered. Our analysis assumed that the expenses would be similar to those incurred by a private insurer.

EXHIBIT 6: ADJUSTMENT FACTOR ANALYSIS

As described above, adjustment factors at the county level were determined to update the underlying coverage limits and AALs to bring them to 2022 levels. Exhibit 6 summarizes the change in coverage A between the modelling dataset created for the prior report and the 2022 Milliman Market Basket. There have been significant updates in the 2022 market basket, including updating the underlying parcel data. As a part of the refresh of the 2022 market basket, table 3A of the NAIC Homeowners reports were considered when updating replacement costs. This was done to provide stability in the changing replacement costs between our data vendors and what we see in the industry. Given the change in exposures, this analysis relies on the prior modelling dataset’s exposures as a baseline and implements an adjustment factor procedure to bring the amount of insurance values and AALs to more recent levels. Based on the premise that CAT models produce damage ratios instead of AALs directly, we assume that an equal change to both exposure and AALs will yield consistent results because the damage ratios will remain unchanged. Column (3) shows the implied state-wide adjustment factor for each state based on the average coverage A in each state between datasets. Only the county-level adjustment factors are used in the analysis to provide a level granularity to the updates; as such, Column (3) is displayed only for informational purposes.

PERIL MAPS

Following Exhibit 6, this report concludes with maps by state of the average unsubsidized premiums calculated in Exhibit 3, the average premium subsidies calculated in Exhibit 1, and a map displaying the average premium burden increase expected at the state level if a subsidized earthquake and flood program were implemented. The unsubsidized premiums represent the estimated premium required to insure these risks without any subsidization. The cross subsidization by peril maps show the difference between the unsubsidized cost of these perils and the subsidized cost, at the state level. The maps are shown for All CAT Perils, flood and earthquake combined, and for the remaining perils. Inland flood and storm surge are combined into a single map for flood.

Limitations

Use of report

The data and exhibits in this report are provided to support the conclusions contained herein, limited to the scope of work specified by NAR, and may not be suitable for other purposes. Milliman is available to answer any questions regarding this report or any other aspect of our review.

Distribution

Milliman's work is prepared solely for the benefit of NAR. Milliman does not intend to benefit any third-party recipient of its work product and Milliman may include a legend on its reports so stating. Except as set forth below, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to legally benefit any third-party recipient of its work product, even if Milliman consents to the release of its work product to a third party. NAR may distribute or submit for publication the final, non-draft version of this report (the Report) that, by mutual written agreement herein, is intended for general public distribution. NAR shall not edit, modify, summarize, abstract, or otherwise change the content of the final Report and any distribution must include the entire Report. Notwithstanding the foregoing, no Milliman report shall be used by NAR in connection with any offering, prospectus, securities filing, or solicitation of investment. Press releases mentioning the Report may be issued by Milliman or NAR upon mutual agreement of NAR and Milliman as to their content. Mentions of Milliman work will provide citations that will allow the reader to obtain the full Report.

Data reliance

In performing this analysis, we relied upon information obtained from RMS, CoreLogic, KatRisk, the U.S. Census Bureau, rate filings, SNL, the Federal Emergency Management Agency (FEMA), the NAIC, and other sources. We have not audited or verified this data and information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. In that event, the results of our analysis may not be suitable for the intended purpose.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency. We did not find material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or relationships that are materially inconsistent. Such a detailed review was beyond the scope of our assignment.

Model reliance

Our analysis is based on multiple catastrophe models from 2020. We have reviewed the model output for reasonableness and consistency. However, no catastrophe model is entirely accurate. The modified catastrophe model results used in this analysis do not reflect changes in the current versions of these catastrophe models. To the extent that one or more models are biased, the resulting analysis may be biased.

Uncertainty

We based our results on generally accepted actuarial procedures and our professional judgment. Our results reflect assumptions that are built into the catastrophe models used, as well as assumptions such as those regarding expense. However, due to the uncertainty associated with the estimation of rates and future loss payments and the inherent limitations of the data, actual results will vary from our projections. Our indications are based on long-term averages and results for any single year may vary significantly from those implied by the indications.

Use of Milliman's name

Any readers of this report agree that they shall not use Milliman's name, trademarks, or service marks, or refer to Milliman directly or indirectly in any third-party communication without Milliman's prior written consent for each such use or release, which consent shall be given in Milliman's sole discretion.

Additional disclaimer

This report contains CoreLogic information and in consideration of having been provided access to this report, recipient agrees that CoreLogic has no liability for the use of such report or other information derived from the report or any use that may be made thereof by recipient.

CONTACT

Rehan Siddique
Rehan.Siddique@milliman.com

Nancy Watkins
Nancy.Watkins@milliman.com

Matt Chamberlain
Matt.Chamberlain@milliman.com

Exhibit 1

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

Premium Subsidy Received / (Paid)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
State	Number of Single Family Residences (Note 1)	Average Coverage A (Note 2)	Hurricane Wind (Note 3)	Severe Convective Storm (Note 3)	Wildfire (Note 3)	Inland Flood (Note 3)	Storm Surge (Note 3)	Earthquake (Note 3)	Total Flood (7) + (8)	Earthquake + Total Flood (9) + (10)	All CAT Perils Sum [(4):(9)]
AL	1,170,021	$281,720	$147	$234	($51)	$20	($146)	($331)	($125)	($457)	($126)
AR	684,312	257,983	(159)	434	(46)	82	(201)	(152)	(119)	(271)	(42)
AZ	1,583,841	353,315	(217)	(124)	257	1	(275)	(406)	(274)	(680)	(764)
CA	6,627,792	553,569	(341)	(376)	250	115	(431)	3,416	(316)	3,100	2,634
CO	1,359,383	430,352	(265)	569	70	26	(335)	(523)	(309)	(833)	(459)
CT	829,924	558,298	22	(317)	(100)	(59)	(115)	(627)	(173)	(801)	(1,196)
DE	254,245	402,645	(60)	(222)	(72)	(76)	(56)	(473)	(132)	(606)	(960)
FL	4,504,615	322,600	1,213	(147)	(9)	(53)	1,522	(393)	1,469	1,076	2,132
GA	2,316,045	337,802	(93)	17	(61)	(106)	(125)	(400)	(231)	(631)	(767)
IA	868,485	298,282	(184)	364	(54)	(35)	(232)	(368)	(267)	(635)	(508)
ID	444,386	341,049	(210)	(222)	611	70	(266)	(330)	(196)	(526)	(347)
IL	2,843,027	385,967	(238)	77	(69)	(84)	(301)	(440)	(384)	(825)	(1,055)
IN	1,761,493	300,119	(185)	175	(54)	(53)	(234)	(340)	(287)	(627)	(691)
KS	729,728	310,525	(191)	1,233	(56)	(50)	(242)	(381)	(292)	(673)	312
KY	1,057,240	267,882	(165)	215	(48)	127	(209)	(278)	(82)	(360)	(357)
LA	1,014,729	276,686	1,196	(3)	(50)	185	1,863	(333)	2,047	1,715	2,858
MA	1,419,106	548,137	166	(345)	(99)	(228)	(285)	(590)	(512)	(1,102)	(1,379)
MD	1,460,857	392,023	(170)	(149)	(71)	(203)	(267)	(467)	(470)	(937)	(1,326)
ME	368,346	404,392	(48)	(264)	(73)	(137)	960	(375)	823	448	62
MI	2,693,688	331,797	(204)	(105)	(60)	(96)	(259)	(399)	(355)	(754)	(1,122)
MN	1,516,263	354,673	(218)	376	(64)	(121)	(276)	(437)	(397)	(834)	(740)
MO	1,535,654	328,872	(202)	464	(59)	(77)	(256)	(282)	(333)	(615)	(412)
MS	656,944	235,824	301	199	(42)	(63)	82	(210)	18	(192)	266
MT	268,686	345,510	(213)	28	86	298	(269)	(289)	28	(260)	(359)
NC	2,380,285	320,092	160	(59)	(58)	47	(78)	(385)	(31)	(416)	(373)
ND	181,608	310,110	(191)	289	(56)	16	(242)	(381)	(226)	(607)	(565)
NE	496,754	274,710	(169)	749	(49)	(110)	(214)	(336)	(324)	(660)	(129)
NH	343,834	387,076	(119)	(246)	(70)	299	(228)	(378)	71	(306)	(741)
NJ	1,914,684	526,040	(69)	(302)	(95)	31	(131)	(576)	(100)	(676)	(1,142)
NM	457,909	315,998	(194)	(45)	370	4	(246)	(314)	(242)	(556)	(426)
NV	606,062	392,696	(242)	(258)	223	2	(306)	(22)	(304)	(326)	(603)
NY	3,176,501	476,198	6	(256)	(86)	(19)	(158)	(514)	(177)	(691)	(1,027)
OH	3,002,501	320,617	(197)	1	(58)	(99)	(250)	(380)	(349)	(728)	(982)
OK	908,157	263,488	(162)	1,098	3	(26)	(205)	(292)	(232)	(524)	415
OR	931,573	359,031	(221)	(242)	2	203	(280)	139	(77)	62	(399)
PA	3,364,442	357,700	(181)	(157)	(64)	112	(279)	(427)	(167)	(594)	(997)
RI	232,412	475,980	508	(278)	(86)	(316)	(264)	(541)	(580)	(1,122)	(978)
SC	1,204,799	336,253	448	(14)	(61)	(67)	1,149	9	1,081	1,090	1,464
SD	217,399	292,522	(180)	368	(53)	43	(228)	(352)	(185)	(537)	(401)
TN	1,647,626	303,243	(187)	282	(55)	78	(236)	(188)	(158)	(346)	(305)
TX	5,951,120	333,661	294	278	(21)	92	694	(405)	785	380	931
UT	703,560	371,339	(229)	(216)	480	3	(289)	458	(286)	172	207
VA	2,016,381	360,812	(103)	(126)	(65)	(81)	(181)	(425)	(262)	(687)	(980)
VT	171,320	376,872	(206)	(228)	(68)	712	(294)	(396)	419	23	(479)
WA	1,676,065	445,732	(274)	(306)	(43)	(50)	(347)	623	(398)	226	(398)
WI	1,518,839	342,966	(211)	33	(62)	(124)	(267)	(421)	(391)	(812)	(1,051)
WV	456,561	286,260	(169)	(55)	(52)	528	(223)	(344)	305	(38)	(314)
WY	146,906	390,009	(240)	138	625	313	(304)	(215)	9	(205)	318
Total	71,676,108	$375,803									

Notes:

1. To account for the change in the number of homes across the U.S.,
   Milliman relied on data from the 2022 American Community Survey (ACS) 5 year estimates of Attached/Detached Single Family Residences.
   This resulted in an increase in the number of homes by approximately 6.9% from the prior report.
2. Column (3) contains the average Coverage A used in modeling at a statewide level.
   The average coverage A values in Column (3) do not match the 2022 Market Basket averages shown in Exhibit 6 due to slight distributional differences at the county level.
3. Columns (4) to (9) = Estimated Average Premium (Exhibit 3) - Coverage A Adjusted Subsidized Premium (Exhibit 2).
4. The analysis includes single-family owner-occupied homes in the United States,
   and excludes homes in Alaska, the District of Columbia, Hawaii, and territories of the United States.

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

Coverage A Adjusted Subsidized Premium

(1) State	(2) Number of Single Family Residences (Note 1)	(3) Average Coverage A (Note 2)	(4) Hurricane Wind (Note 3)	(5) Severe Convective Storm (Note 3)	(6) Wildfire (Note 3)	(7) Inland Flood (Note 3)	(8) Storm Surge (Note 3)	(9) Earthquake (Note 3)	(10) Total Flood (7) + (8)	(11) Earthquake + Total Flood (9) + (10)	(12) All CAT Perils Sum [(4):(9)]
AL	1,170,021	$281,720	$173	$196	$51	$291	$219	$350	$510	$861	$1,281
AR	684,312	257,983	159	180	46	266	201	321	467	788	1,173
AZ	1,583,841	353,315	217	246	64	365	275	440	640	1,079	1,607
CA	6,627,792	553,569	341	386	100	571	431	689	1,003	1,691	2,518
CO	1,359,383	430,352	265	300	77	444	335	535	779	1,315	1,957
CT	829,924	558,298	344	389	100	576	435	695	1,011	1,706	2,539
DE	254,245	402,645	248	281	72	416	314	501	729	1,230	1,831
FL	4,504,615	322,600	199	225	58	333	251	401	584	986	1,467
GA	2,316,045	337,802	208	236	61	349	263	420	612	1,032	1,536
IA	868,485	298,282	184	208	54	308	232	371	540	911	1,357
ID	444,386	341,049	210	238	61	352	266	424	618	1,042	1,551
IL	2,843,027	385,967	238	269	69	398	301	480	699	1,179	1,755
IN	1,761,493	300,119	185	209	54	310	234	373	544	917	1,365
KS	729,728	310,525	191	217	56	320	242	386	562	949	1,412
KY	1,057,240	267,882	165	187	48	276	209	333	485	818	1,218
LA	1,014,729	276,686	170	193	50	286	216	344	501	845	1,258
MA	1,419,106	548,137	337	382	99	566	427	682	993	1,675	2,493
MD	1,460,857	392,023	241	273	71	405	305	488	710	1,198	1,783
ME	368,346	404,392	249	282	73	417	315	503	732	1,236	1,839
MI	2,693,688	331,797	204	231	60	342	259	413	601	1,014	1,509
MN	1,516,263	354,673	218	247	64	366	276	441	642	1,084	1,613
MO	1,535,654	328,872	202	229	59	339	256	409	596	1,005	1,496
MS	656,944	235,824	145	164	42	243	184	293	427	720	1,073
MT	268,686	345,510	213	241	62	357	269	430	626	1,056	1,571
NC	2,380,285	320,092	197	223	58	330	249	398	580	978	1,456
ND	181,608	310,110	191	216	56	320	242	386	562	947	1,410
NE	496,754	274,710	169	192	49	284	214	342	498	839	1,249
NH	343,834	387,076	238	270	70	400	302	482	701	1,183	1,760
NJ	1,914,684	526,040	324	367	95	543	410	654	953	1,607	2,392
NM	457,909	315,998	194	220	57	326	246	393	572	965	1,437
NV	606,062	392,696	242	274	71	405	306	489	711	1,200	1,786
NY	3,176,501	476,198	293	332	86	491	371	592	862	1,455	2,166
OH	3,002,501	320,617	197	224	58	331	250	399	581	980	1,458
OK	908,157	263,488	162	184	47	272	205	328	477	805	1,198
OR	931,573	359,031	221	250	65	371	280	447	650	1,097	1,633
PA	3,364,442	357,700	220	249	64	369	279	445	648	1,093	1,627
RI	232,412	475,980	293	332	86	491	371	592	862	1,454	2,165
SC	1,204,799	336,253	207	235	61	347	262	418	609	1,027	1,529
SD	217,399	292,522	180	204	53	302	228	364	530	894	1,330
TN	1,647,626	303,243	187	212	55	313	236	377	549	926	1,379
TX	5,951,120	333,661	205	233	60	344	260	415	604	1,019	1,518
UT	703,560	371,339	229	259	67	383	289	462	673	1,135	1,689
VA	2,016,381	360,812	222	252	65	372	281	449	653	1,102	1,641
VT	171,320	376,872	232	263	68	389	294	469	683	1,151	1,714
WA	1,676,065	445,732	274	311	80	460	347	555	807	1,362	2,027
WI	1,518,839	342,966	211	239	62	354	267	427	621	1,048	1,560
WV	456,561	286,260	176	200	52	295	223	356	518	875	1,302
WY	146,906	390,009	240	272	70	403	304	485	706	1,192	1,774
Overall	71,676,108	$375,803	$231	$262	$68	$388	$293	$468	$681	$1,148	$1,709
Overall Estimated Rate per 1000 Coverage A (Note 4)			$0.62	$0.70	$0.18	$1.03	$0.78	$1.24	$1.81	$3.06	$4.55

Notes:
1. To account for the change in the number of homes across the U.S.,
   Milliman relied on data from the 2022 American Community Survey (ACS) 5 year estimates of Attached/Detached Single Family Residences.
   This resulted in an increase in the number of homes by approximately 6.9% from the prior report.
2. Column (3) contains the average Coverage A used in modeling at a statewide level.
   The average coverage A values in Column (3) do not match the 2022 Market Basket averages shown in Exhibit 6 due to slight distributional differences at the county level.
3. Columns (4) to (9) calculated as Overall estimated rate per 1000 Coverage A * State average Coverage A / 1000.
4. Overall Estimated Rate per 1000 Coverage A = Overall average premium by peril / (Overall average Coverage A / 1000).

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

Estimated Average Unsubsidized Premium

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
State	Number of Single Family Residences (Note 1)	Hurricane Wind (Note 2)	Severe Convective Storm (Note 3)	Wildfire (Note 4)	Inland Flood (Note 5)	Storm Surge (Note 6)	Earthquake (Note 7)	Total Flood (6) + (7)	Earthquake + Total Flood (8) + (9)	All CAT Perils Sum [(3):(8)]
AL	1,170,021	$321	$431	$0	$311	$74	$19	$385	$404	$1,155
AR	684,312	$0	614	0	348	0	169	348	518	1,131
AZ	1,583,841	$0	123	321	366	0	33	366	399	843
CA	6,627,792	$0	10	350	687	0	4,105	687	4,791	5,152
CO	1,359,383	$0	869	147	470	0	12	470	482	1,498
CT	829,924	$366	72	0	517	320	67	838	905	1,343
DE	254,245	$188	58	0	339	258	28	597	625	871
FL	4,504,615	$1,411	78	49	280	1,774	9	2,053	2,062	3,600
GA	2,316,045	$115	253	0	243	138	20	381	401	769
IA	868,485	$0	573	0	273	0	3	273	276	849
ID	444,386	$0	16	673	422	0	95	422	516	1,205
IL	2,843,027	$0	346	0	315	0	40	315	355	701
IN	1,761,493	$0	384	0	256	0	33	256	290	674
KS	729,728	$0	1,449	0	270	0	5	270	276	1,725
KY	1,057,240	$0	402	0	404	0	55	404	459	861
LA	1,014,729	$1,366	190	0	470	2,078	12	2,549	2,560	4,116
MA	1,419,106	$504	38	0	338	142	92	480	572	1,114
MD	1,460,857	$71	124	0	202	38	21	240	261	457
ME	368,346	$201	18	0	280	1,275	128	1,556	1,683	1,902
MI	2,693,688	$0	127	0	246	0	14	246	260	387
MN	1,516,263	$0	623	0	245	0	5	245	250	873
MO	1,535,654	$0	694	0	263	0	127	263	390	1,083
MS	656,944	$446	363	0	180	265	83	446	528	1,338
MT	268,686	$0	269	148	654	0	141	654	795	1,213
NC	2,380,285	$357	165	0	377	172	13	549	562	1,083
ND	181,608	$0	505	0	336	0	4	336	340	845
NE	496,754	$0	941	0	174	0	6	174	180	1,121
NH	343,834	$120	24	0	699	74	104	772	876	1,020
NJ	1,914,684	$254	65	0	574	279	78	853	931	1,250
NM	457,909	$0	176	427	330	0	79	330	409	1,012
NV	606,062	$0	16	293	407	0	467	407	874	1,183
NY	3,176,501	$299	76	0	473	213	79	685	764	1,139
OH	3,002,501	$0	225	0	232	0	19	232	251	476
OK	908,157	$0	1,282	51	246	0	35	246	281	1,613
OR	931,573	$0	8	66	574	0	586	574	1,159	1,233
PA	3,364,442	$39	93	0	481	0	18	481	498	630
RI	232,412	$800	53	0	175	107	51	282	333	1,187
SC	1,204,799	$655	221	0	280	1,411	427	1,690	2,117	2,994
SD	217,399	$0	572	0	345	0	12	345	357	929
TN	1,647,626	$0	494	0	391	0	189	391	580	1,074
TX	5,951,120	$500	510	39	436	954	10	1,390	1,399	2,448
UT	703,560	$0	43	547	386	0	920	386	1,306	1,896
VA	2,016,381	$119	126	0	291	100	24	391	416	661
VT	171,320	$26	35	0	1,101	0	73	1,101	1,174	1,235
WA	1,676,065	$0	4	37	410	0	1,178	410	1,587	1,629
WI	1,518,839	$0	273	0	230	0	6	230	236	509
WV	456,561	$7	145	0	824	0	13	824	836	988
WY	146,906	$0	410	695	716	0	271	716	986	2,091
Total (Note 3)	71,676,108	$231	$262	$68	$388	$293	$468	$681	$1148	$1709

Notes:

1. Single Family Residences based on 2022 American Community Survey (ACS) 5 year estimates of Attached/Detached Single Family Residences.
2. Hurricane Wind Premium = Hurricane Wind Loss * (1 + 13.1% LAE) / (1 - 20.4% VE - 5.4% Profit - 13.6% Reinsurance).
3. Severe Convective Storm Premium = Severe Convective Storm Loss * (1 + 13.1% LAE) / (1 - 20.4% VE - 5.4% Profit - 2.1% Severe Convective Storm Reinsurance).
4. Wildfire Premium = Wildfire Loss * (1 + 13.1% LAE) / (1 - 20.4% VE - 5.4% Profit - 2.1% Wildfire Reinsurance).
5. Inland Flood Premium = Inland Flood Loss * (1 + 13.1% LAE) * 2.054 Reinsurance Load / (1 - 20.4% VE - 5.4% Profit).
6. Storm Surge Premium = Storm Surge Loss * (1 + 13.1% LAE) * 2.782 Reinsurance Load / (1 - 20.4% VE - 5.4% Profit).
7. Earthquake Premium = Earthquake Loss * (1 + 13.1% LAE) * 2.455 Reinsurance Load / (1 - 20.4% VE - 5.4% Profit).
8. Expense details from above calculations available in Exhibit 5.

Exhibit 4

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

Average Loss

(1) State	(2) Number of Single Family Residences (Note 1)	(3) Model Count (Note 2)	(4) Hurricane Wind (Note 4)	(5) Severe Convective Storm (Note 5)	(6) Wildfire (Note 6)	(7) Inland Flood (Note 7)	(8) Storm Surge (Note 8)	(9) Earthquake (Note 9)	(10) Total Flood (7) + (8)	(11) Earthquake + Total Flood (9) + (10)	(12) All CAT Perils Sum [(4):(9)]
AL	1,170,021	119,998	$172	$275	$0	$99	$17	$5	$117	$122	$568
AR	684,312	70,000	0	391	0	111	0	45	111	156	548
AZ	1,583,841	150,000	0	78	204	117	0	9	117	126	408
CA	6,627,792	649,999	0	7	223	219	0	1,097	219	1,316	1,546
CO	1,359,383	130,000	0	554	94	150	0	3	150	153	801
CT	829,924	90,007	196	46	0	165	76	18	241	259	501
DE	254,245	30,002	101	37	0	108	61	7	169	176	314
FL	4,504,615	400,000	756	50	31	89	418	2	508	510	1,346
GA	2,316,045	220,001	62	161	0	78	33	5	110	116	338
IA	868,485	50,006	0	365	0	87	0	1	87	88	453
ID	444,386	40,000	0	10	429	135	0	25	135	160	599
IL	2,843,027	259,999	0	221	0	101	0	11	101	111	332
IN	1,761,493	99,999	0	245	0	82	0	9	82	91	336
KS	729,728	50,000	0	924	0	86	0	1	86	88	1,011
KY	1,057,240	50,017	0	256	0	129	0	15	129	144	400
LA	1,014,729	100,000	732	121	0	150	490	3	640	643	1,496
MA	1,419,106	140,001	270	24	0	108	34	25	142	166	460
MD	1,460,857	149,996	38	79	0	64	9	6	73	79	197
ME	368,346	40,000	108	11	0	89	301	34	390	424	543
MI	2,693,688	260,001	0	81	0	79	0	4	79	82	163
MN	1,516,263	100,002	0	397	0	78	0	1	78	80	477
MO	1,535,654	100,000	0	442	0	84	0	34	84	118	560
MS	656,944	70,000	239	232	0	58	63	22	120	142	613
MT	268,686	30,000	0	172	94	209	0	38	209	247	512
NC	2,380,285	230,006	191	105	0	120	40	3	161	164	460
ND	181,608	20,000	0	322	0	107	0	1	107	108	430
NE	496,754	50,002	0	600	0	56	0	2	56	57	657
NH	343,834	40,002	64	15	0	223	17	28	240	268	348
NJ	1,914,684	190,001	136	42	0	183	66	21	249	270	448
NM	457,909	50,000	0	112	272	105	0	21	105	127	510
NV	606,062	60,001	0	10	187	130	0	125	130	255	452
NY	3,176,501	309,983	160	48	0	151	50	21	201	222	431
OH	3,002,501	260,000	0	143	0	74	0	5	74	79	222
OK	908,157	89,999	0	817	32	78	0	9	78	88	937
OR	931,573	90,000	0	5	42	183	0	156	183	340	387
PA	3,364,442	330,008	21	59	0	154	0	5	154	158	238
RI	232,412	30,000	429	34	0	56	25	14	81	95	557
SC	1,204,799	119,995	351	141	0	89	333	114	422	536	1,028
SD	217,399	29,992	0	365	0	110	0	3	110	113	478
TN	1,647,626	159,998	0	315	0	125	0	51	125	175	490
TX	5,951,120	560,001	268	325	25	139	225	3	364	367	984
UT	703,560	50,000	0	27	349	123	0	246	123	369	745
VA	2,016,381	199,990	64	80	0	93	24	6	117	123	267
VT	171,320	19,997	14	22	0	352	0	19	352	371	407
WA	1,676,065	160,000	0	3	24	131	0	315	131	446	472
WI	1,518,839	100,001	0	174	0	74	0	2	74	75	249
WV	456,561	49,997	4	92	0	263	0	3	263	266	362
WY	146,906	19,998	0	261	443	229	0	72	229	301	1,005
Total (Note 3)	71,676,108	6,619,999	$124	$167	$43	$124	$69	$125	$193	$318	$652

Notes:

1. Single Family Residences based on 2022 American Community Survey (ACS) 5 year estimates of Attached/Detached Single Family Residences.
2. Count of records used for modeling AALs. CA Earthquake modeling was completed with 150,000 records.
   The geocoding methodologies have been refreshed to reflect more accurate property locations.
   A small number of state-border properties have shifted states compared to the prior report due to this update.
3. Totals weighted based on Number of Single Family Residences (Column 2).
4. Average of modeled location AALs using RMS v17.0 long term with demand surge.
5. Average of modeled location AALs using RMS v17.0 high and low frequency with demand surge.
6. Average of modeled location AALs using CoreLogic RQE® 19.2. States with $0 AAL were not modeled.
7. Average of modeled location AALs using KatRisk.
8. Average of modeled location AALs as 50/50 weighting of KatRisk and RMS v17.0 long term with demand surge. RMS storm surge calculated as hurricane with storm surge less hurricane only.
9. Average of modeled location AALs using RMS v17.0 (shake only) stochastic event rates with demand surge.

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

Expense, Profit, and Reinsurance Summary

	Item	(1) State Farm (SNL P&C Group) (Note 1)	(2) Allstate Corp (SNL P&C Group) (Note 1)	(3) Liberty Mutual (SNL P&C Group) (Note 1)	(4) USAA (SNL P&C Group) (Note 1)	(5) Weighted Average	(6) Median	(7) Selected (Note 2)	(8) Prior
A	Written Premium	$27,037,940	$13,551,254	$10,476,328	$10,346,044				
B.	Earned Premium	$25,705,654	$12,722,772	$10,140,532	$9,515,308				
C.	Commission and Brokerage	$3,048,424	$1,554,007	$1,369,938	$4,014				
	Commission Percentage = C / A	11.3%	11.5%	13.1%	0.0%	9.7%	11.4%	9.7%	10.3%
D.	Other Acquisition Expenses	$1,791,710	$447,113	$117,365	$1,052,184				
	Other Acquisition Percentage = D / A	6.6%	3.3%	1.1%	10.2%	5.6%	5.0%	5.6%	9.5%
E.	General Expenses	$425,477	$367,172	$574,699	$120,302				
	General Expense Percentage = E / B	1.7%	2.9%	5.7%	1.3%	2.6%	2.3%	2.6%	3.4%
F.	Taxes, Licenses & Fees	$640,186	$304,907	$276,989	$219,618				
	Taxes, Licenses & Fees Percentage = F / A	2.4%	2.3%	2.6%	2.1%	2.3%	2.3%	2.3%	2.5%
G.	Other Expense (Income)	($24,044)	$48,348	$66,888	$35,753				
	Other Expense Percentage = G / A	-0.1%	0.4%	0.6%	0.3%	0.2%	0.4%	0.2%	0.4%
H.	Profit and Contingencies (Note 3)							5.4%	5.0%
I.	Variable Expense, Excluding Reinsurance Expense and Profit = Sum of C to G					20.4%	21.3%	20.4%	24.1%
J.	Incurred Loss	$19,814,609	$8,959,285	$6,952,186	$7,442,632				
K.	Loss Adjustment Expense	$2,657,737	$1,145,838	$980,855	$864,769				
	Loss Adjustment Expense Percentage = K / J	13.4%	12.8%	14.1%	11.6%	13.1%	13.1%	13.1%	16.0%
L.	Permissible Loss Ratio							70.4%	65.4%
	Permissible Loss Ratio = (1-I) / (1+K)								

Notes:
1. Source: Homeowners data, 2023 IEE Part III from State Farm (SNL P&C Group), Allstate Corp (SNL P&C Group), Liberty Mutual (SNL P&C Group), and USAA (SNL P&C Group). Companies selected based on the NAIC 2023 Market Share report https://content.naic.org/sites/default/files/research-actuarial-property-casualty-market-share.pdf. All dollar amounts in thousands.
2. Selections of C, D, E, F, G and J are based on the Weighted Averages of Columns (1) to (4), rounded to 3 decimal places.
3. Profit Provision based on State Farm Remaining Underwriting Profit and Contingencies load within latest approved TX filing (SFMA-133764838).

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

AAL Multipliers

(1)	(2)	(3)	(4)	(5)	(6)	(7)
LOB	State	Filing Company	SERFF/I-File Tracking Number	Annual Expected Loss	Cost of Reinsurance Net of Recoveries and Fees	AAL Multiplier
Earthquake	CA	California Earthquake Authority	CAEQ-132757247	$429,709,426	$311,299,888	1.724
Earthquake	CA	Geovera Insurance Company	11-2233 (Note 1)	28,209,956	61,664,058	3.186
Inland Flood	SC	Palomar Specialty Insurance Company	PALO-131604953	50,000	43,600	1.872
Inland Flood	TX	American Risk Insurance Company	ARSK-132045704	577,183	288,505	1.500
Inland Flood	TX	SureChoice Underwriters Reciprocal Exchange (Note 2)	SAGE-133060857			2.400
Inland Flood	NC	North Carolina Rate Bureau (Note 3)	NCRI-132077608			2.446
Storm Surge	SC	Palomar Specialty Insurance Company	PALO-131604953	50,000	43,600	1.872
Storm Surge	TX	American Risk Insurance Company	ARSK-132045704	18,224	27,339	2.500
Storm Surge	TX	SureChoice Underwriters Reciprocal Exchange (Note 2)	SAGE-133060857			4.000
Storm Surge	NC	North Carolina Rate Bureau (Note 3)	NCRI-132077608			2.756

Peril	Prior Selected	Selected (Note 4)
Earthquake	2.410	2.455
Inland Flood	1.939	2.054
Storm Surge	2.376	2.782

Notes:
1. No SERFF number available. CA tracking number listed.
2. Swiss Re derived these Loss Cost Multipliers, as explained in the filing memorandum for this program.
3. Program is unchanged since initial filing in 2019. Multiplier based on projected reinsurance costs in Loss Cost Multiplier exhibit.
4. Selected AAL Multipliers based on the average of AAL Multipliers from enclosed filings above.

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide

Reinsurance Loads

Hurricane Wind

(1) State	(2) Filing Company	(3) SERFF/I-File Tracking Number	(4) Homeowners Reinsurance Percent of Premium
FL	Castle Key Insurance Company	22-047941	21.90%
FL	State Farm Florida Insurance Company	23-009005	12.80%
FL	Universal Property and Casualty Insurance Company	22-044135	21.06%
FL	Security First Insurance Company	23-024349	55.36%
FL Average			27.78%
LA	Encompass Property and Casualty Company	ALSE-132451090	6.40%
LA	Progressive Property Insurance Company	AMSI-133759921	32.20%
LA	SureChoice Underwriters Reciprocal Exchange	SAGE-134028974	37.90%
LA	Allstate Vehicle and Property Insurance Company	ALSE-133528999	5.90%
LA	State Farm Fire and Casualty Company	SFMA-130873917	9.50%
LA Average			18.38%
SC	State Farm Fire and Casualty Company	SFMA-133833548	5.10%
SC	Allstate Vehicle and Property Insurance Company	ALSE-132793260	4.50%
SC	Travelers Personal Insurance Company	TRVD-133374286	1.10%
SC	Allied Property and Casualty Insurance Company	NWPP-133509545	4.70%
SC Average			3.85%
TX	State Farm Lloyds	SFMA-131085699	3.70%
TX	Allstate Vehicle and Property Insurance Company	ALSE-133790449	8.00%
TX	American Economy Insurance Company	LBPM-133872665	2.00%
TX	United Services Automobile Association	USAA-130998576	4.20%
TX Average			4.48%

Premium Scenario	Selected Hurricane Wind Reinsurance Percent of Premium
Selected	13.6%
Prior	6.9%

Notes:

1. Selected Hurricane Wind Cost of Reinsurance based on average of all listed state averages for Homeowners.
   As some companies have begun to file aspects of their programs as trade-secret,
   only the most recently available public data is used for this exhibit
   The Homeowners programs above cover non-hurricane losses, thus the selection of the cost of reinsurance
   equal to the cost for the entire program is a conservative selection.

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide

Reinsurance Loads

Severe Convective Storm

(1)	(2)	(3)	(4)
State	Filing Company	SERFF Tracking Number	Homeowners Reinsurance Percent of Premium
IA	Homesite Insurance Company of the Midwest	HMSS-134120012	2.40%
KS	American Strategic Insurance Corp	AMSI-133527120	1.20%
MO	American Family Mutual Insurance Company	AMFC-134032924	3.00%
NE	American Family Mutual Insurance Company	AMFC-134060034	1.90%

Premium Scenario	Selected Severe Convective Storm Reinsurance Percent of Premium
Selected	2.1%
Prior	0.0%

Notes:
1. Selected Severe Convective Storm Cost of Reinsurance based on average of all listed costs for Homeowners.
As some companies have begun to file aspects of their programs as trade-secret,
only the most recently available public data is used for this exhibit
The Homeowners programs above cover non-SCS losses, thus the selection of the cost of reinsurance
equal to the cost for the entire program is a conservative selection.
The states we have selected tend to have majority SCS losses so the reinsurance cost typically reflects this peril the mo

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide

Reinsurance Loads

Wildfire

(1) State	(2) Filing Company	(3) SERFF Tracking Number	(4) Homeowners Reinsurance Percent of Premium
NM	Property and Casualty Insurance Company of Hartford	HART-134072332	1.00%
NM	Foremost Insurance Company Grand Rapids, Michigan	FORE-133875685	1.10%
OR	Homesite Insurance Company of the Midwest	HMSS-134058230	3.50%
NV	American Family Mutual Insurance Company	AMFC-133935250	2.90%

Premium Scenario	Selected Wildfire Reinsurance Percent of Premium
Selected	2.1%
Prior	0.0%

Notes:

1. Selected Wildfire Cost of Reinsurance based on average of all listed costs for Homeowners.
   As some companies have begun to file aspects of their programs as trade-secret,
   only the most recently available public data is used for this exhibit
   The Homeowners programs above cover non-WF losses, thus the selection of the cost of reinsurance
   equal to the cost for the entire program is a conservative selection.
   The states we have selected tend to have majority WF losses so the reinsurance cost typically reflects this peril the most.

National Association of Realtors
Single-Family Owner-Occupied Homeowners
Countrywide (excluding Washington D.C., Alaska and Hawaii)

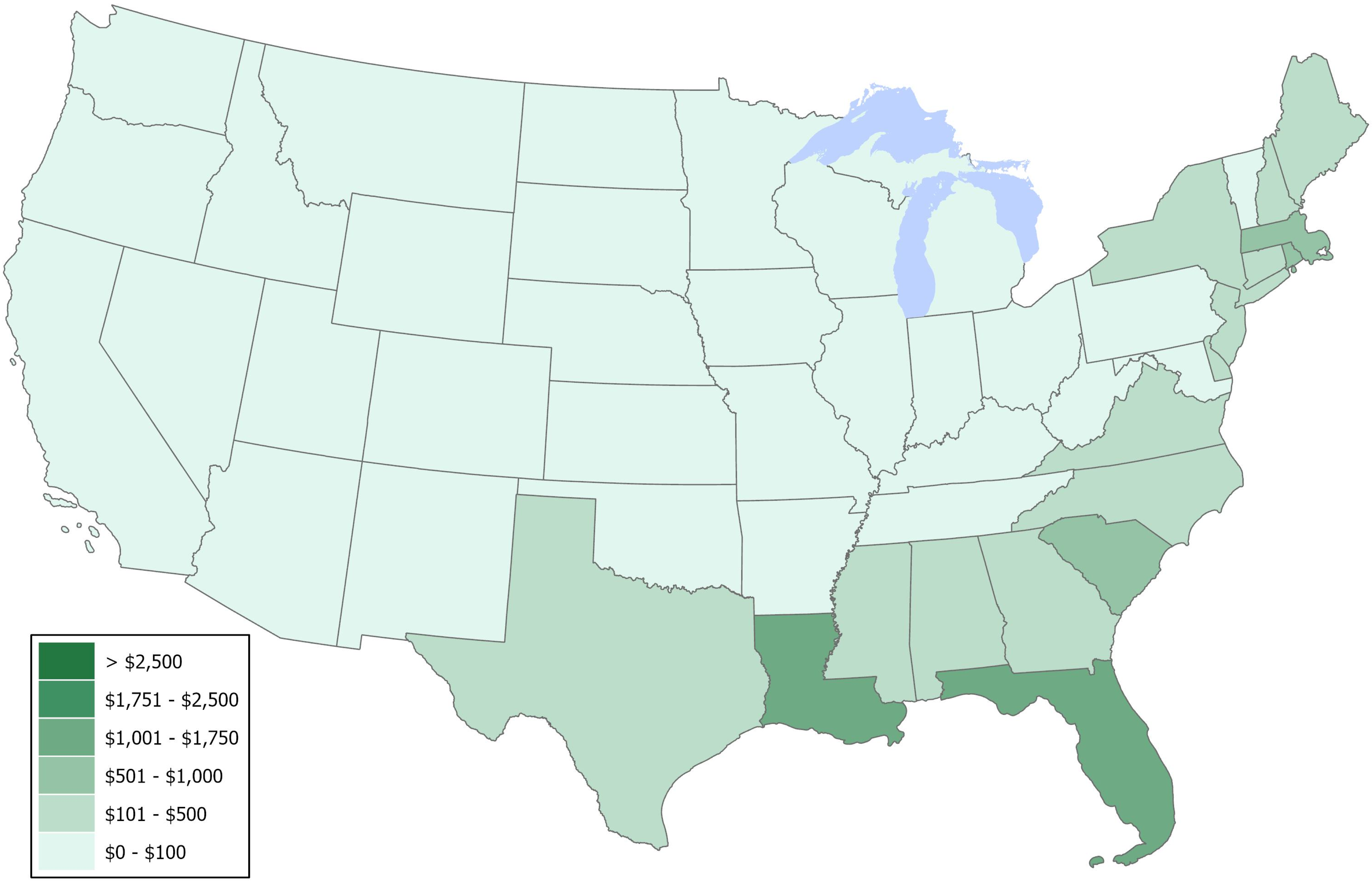
Average Selected Three Year Adjustment Factor by State

	(1)	(2)	(3)
	Average Coverage A		Market Basket 3-Year Adjustment Factor
State	Prior NAR Report	2022 Market Basket	= (2) / (1)
Alabama	$215,626	$286,293	1.328
Arkansas	204,247	262,370	1.285
Arizona	261,709	352,156	1.346
California	392,517	568,261	1.448
Colorado	311,607	425,718	1.366
Connecticut	380,855	563,597	1.480
Delaware	306,795	401,639	1.309
Florida	266,037	322,958	1.214
Georgia	259,892	344,590	1.326
Iowa	217,481	303,140	1.394
Idaho	247,058	330,830	1.339
Illinois	313,495	393,354	1.255
Indiana	227,469	301,690	1.326
Kansas	226,037	321,973	1.424
Kentucky	216,594	275,589	1.272
Louisiana	218,263	282,644	1.295
Massachusetts	403,383	538,068	1.334
Maryland	324,310	394,296	1.216
Maine	278,654	368,788	1.323
Michigan	255,182	342,222	1.341
Minnesota	283,535	363,475	1.282
Missouri	246,353	329,498	1.338
Mississippi	196,171	238,445	1.215
Montana	248,439	342,387	1.378
North Carolina	242,053	325,629	1.345
North Dakota	232,928	305,972	1.314
Nebraska	209,791	277,205	1.321
New Hampshire	314,200	388,249	1.236
New Jersey	397,955	519,839	1.306
New Mexico	247,274	320,662	1.297
Nevada	294,056	394,680	1.342
New York	350,952	503,574	1.435
Ohio	238,773	324,632	1.360
Oklahoma	206,495	263,580	1.276
Oregon	281,917	358,587	1.272
Pennsylvania	278,481	364,892	1.310
Rhode Island	336,730	466,541	1.386
South Carolina	244,761	345,399	1.411
South Dakota	220,478	290,654	1.318
Tennessee	227,406	306,760	1.349
Texas	232,172	338,060	1.456
Utah	275,266	366,514	1.331
Virginia	304,797	396,774	1.302
Vermont	309,064	380,454	1.231
Washington	313,929	453,949	1.446
Wisconsin	261,826	347,743	1.328
West Virginia	217,746	283,132	1.300
Wyoming	248,869	396,592	1.594

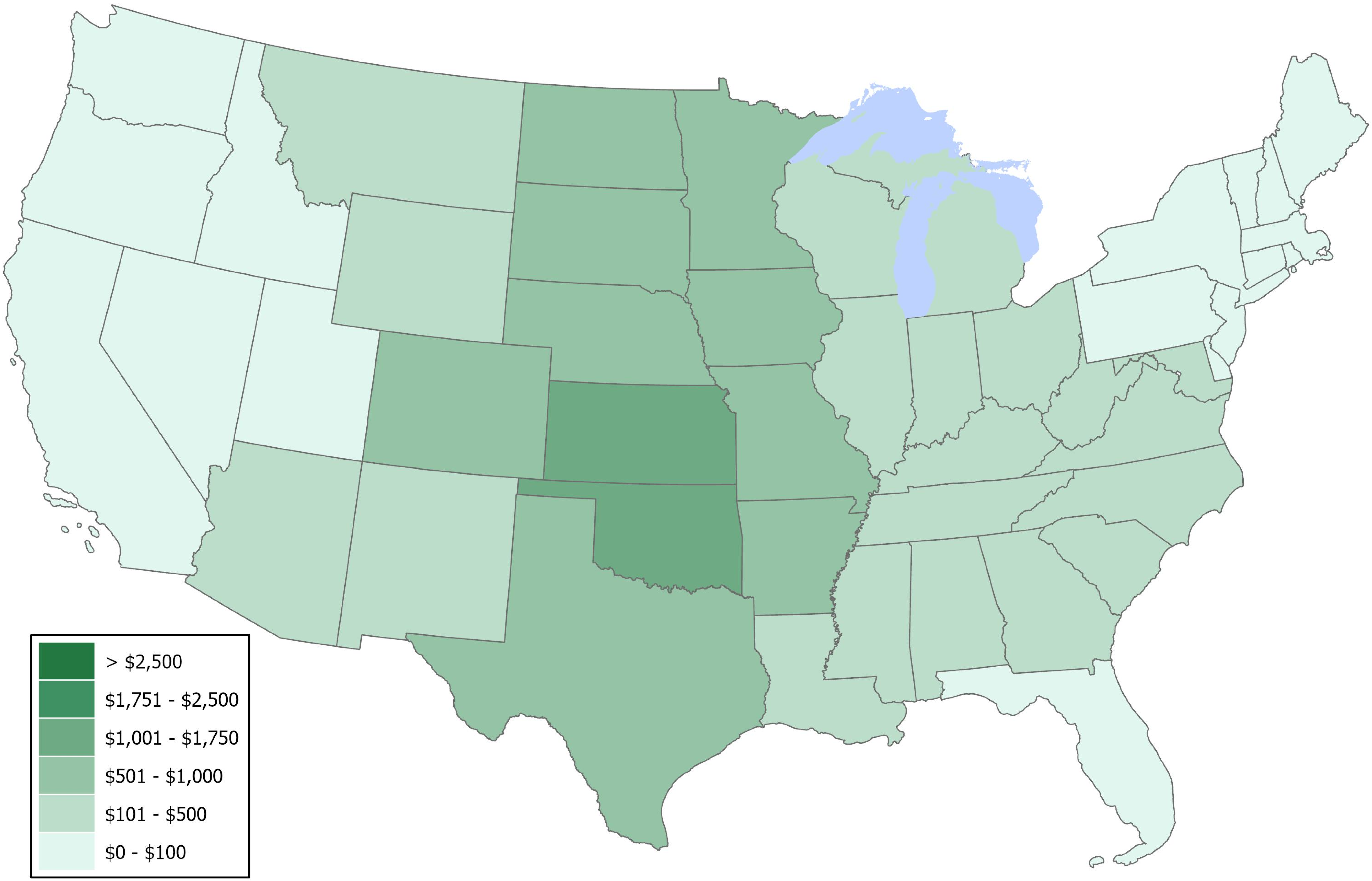
Notes:

1. This exhibit is for intended for informational purposes only so the user of this report can understand the average amount of change within each state between reports. This was done to condense the information into a reasonable sized document for publishing purposes. The true adjustment factors used in the analysis are determined at the county level.

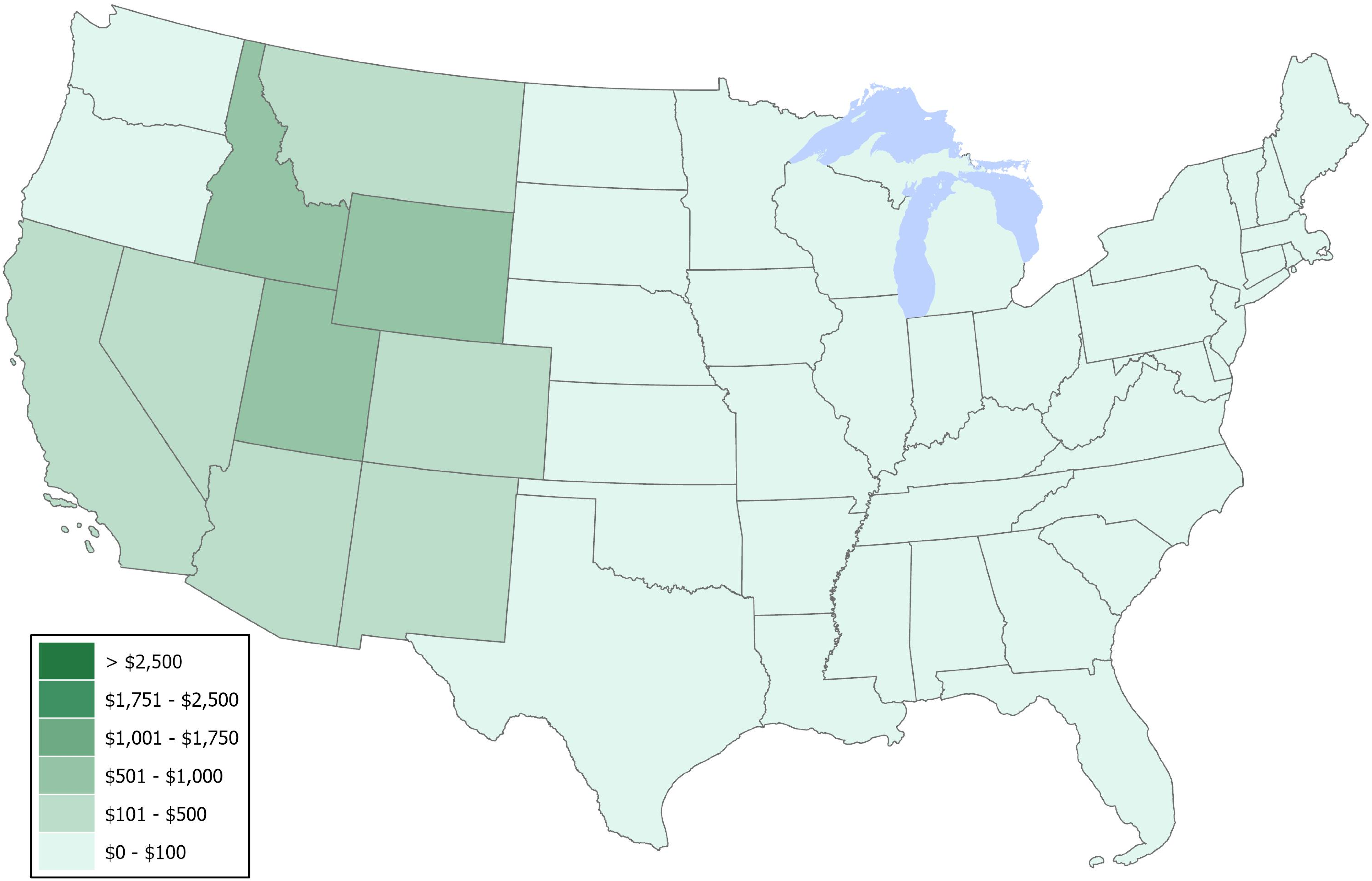
Unsubsidized Premium by Peril: Hurricane Wind



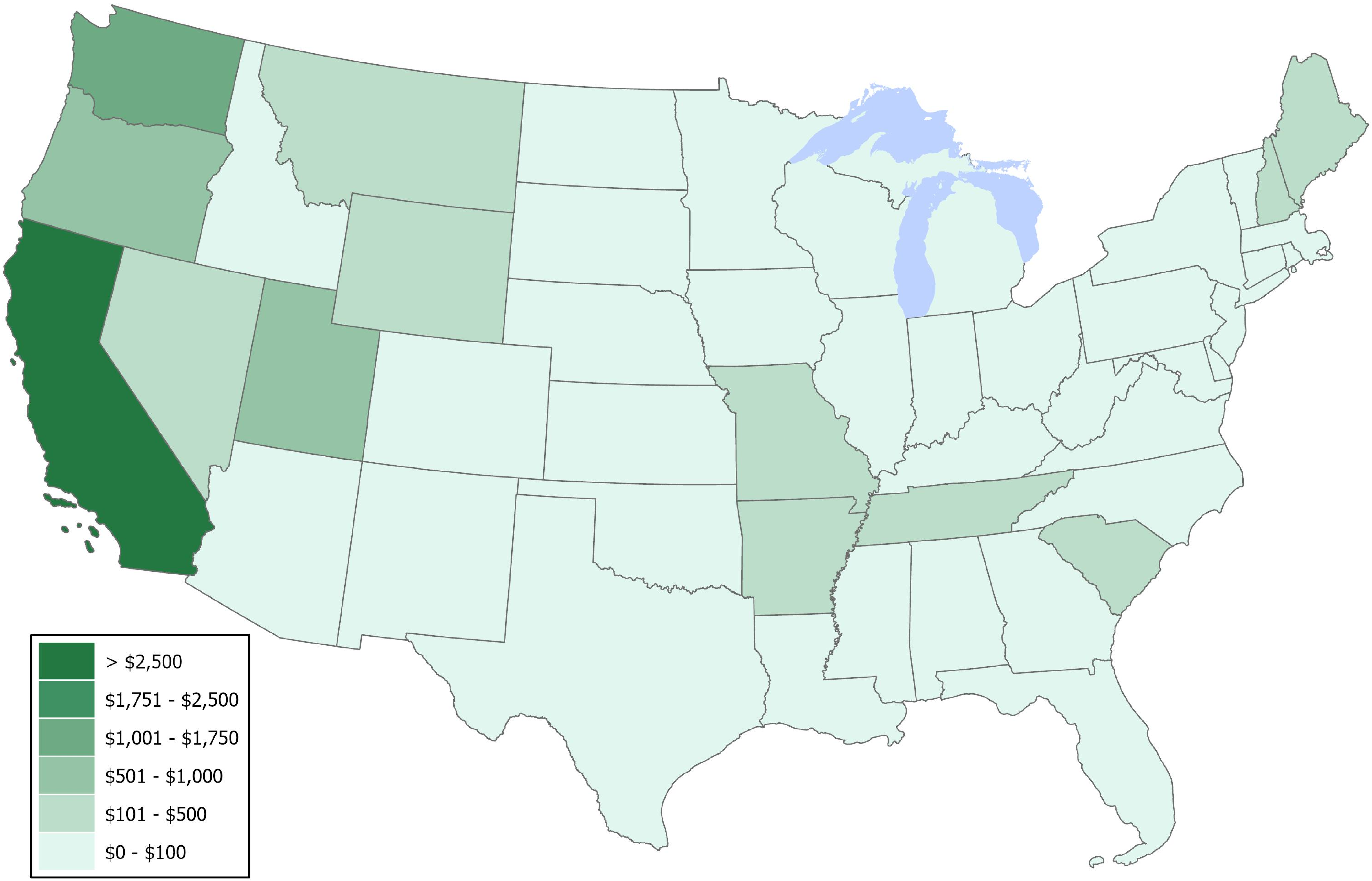
Unsubsidized Premium by Peril: Severe Convective Storm



Unsubsidized Premium by Peril: Wildfire

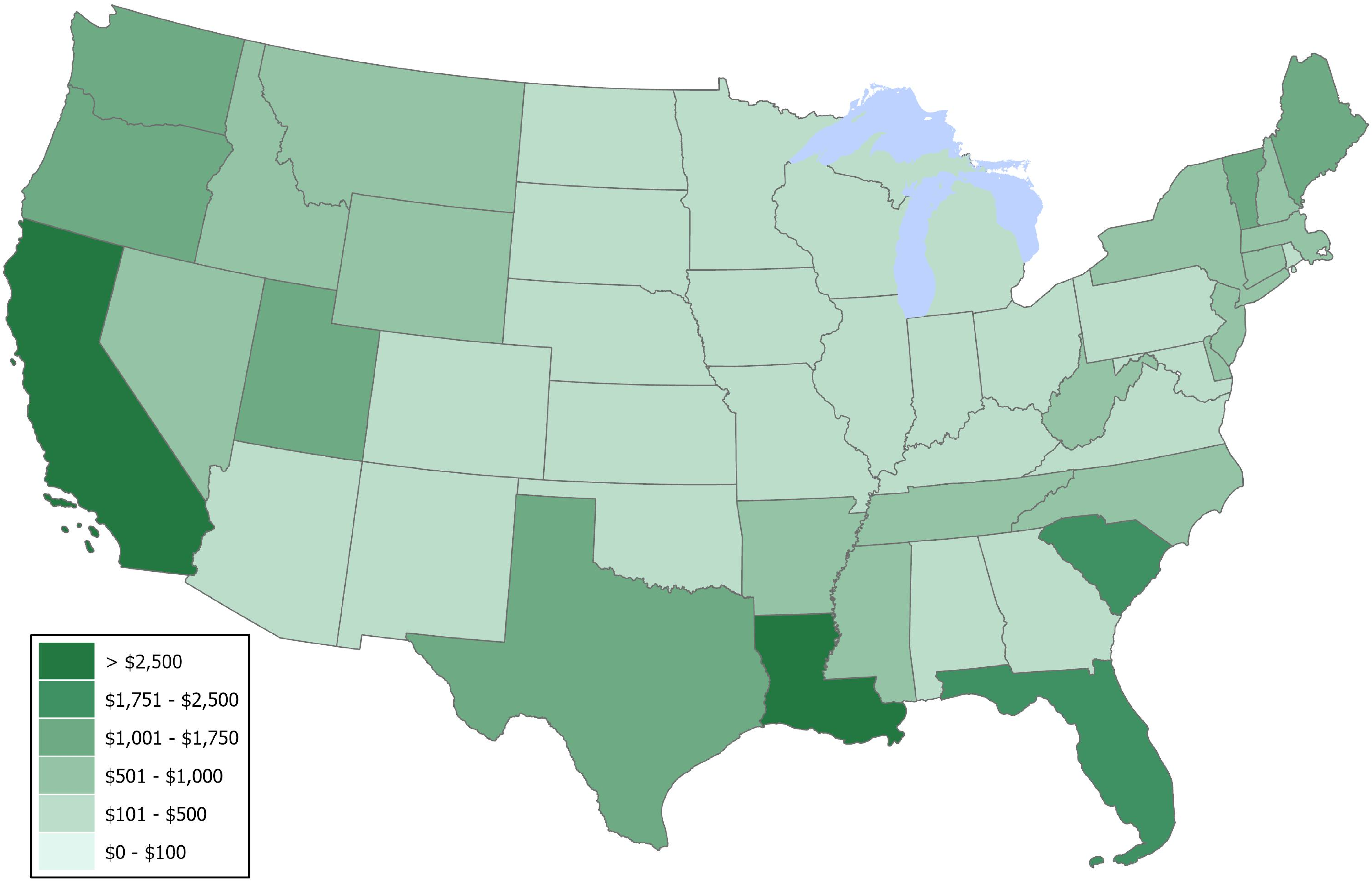


Unsubsidized Premium by Peril: Earthquake

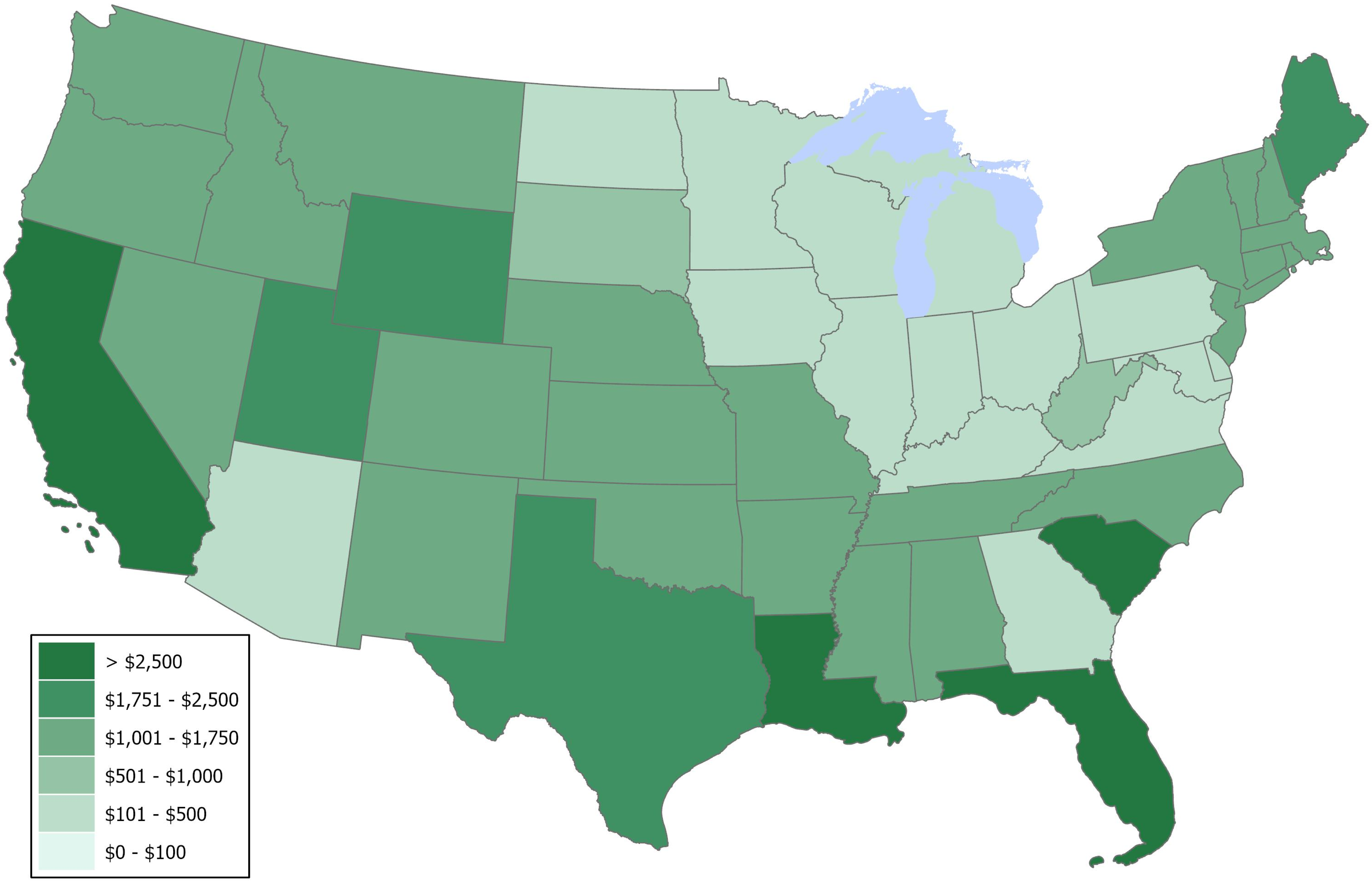



Unsubsidized Premium by Peril: Flood
> $2,500
$1,751 - $2,500
$1,001 - $1,750
$501 - $1,000
$101 - $500
$0 - $100

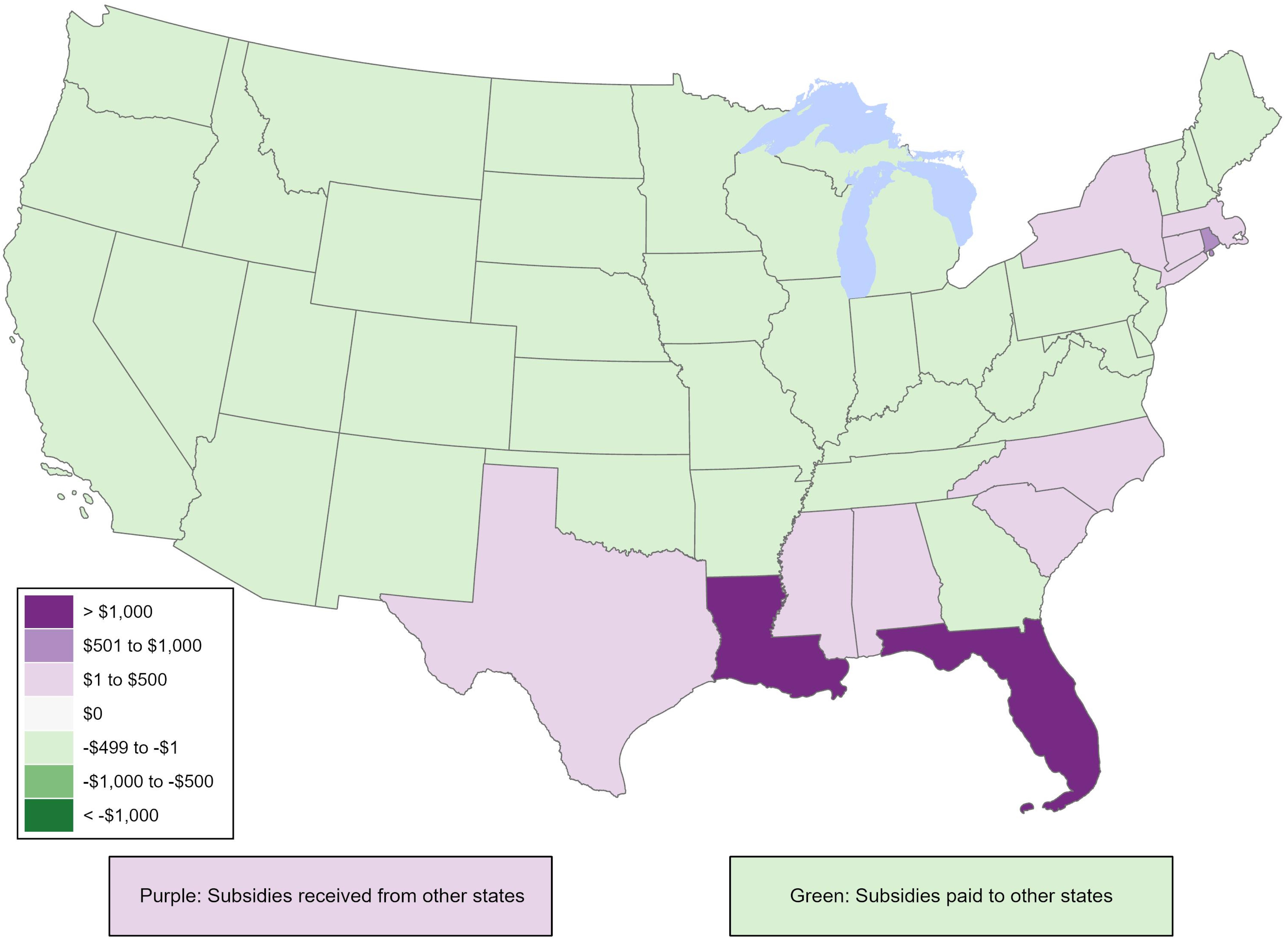
Unsubsidized Premium by Peril: Earthquake and Flood



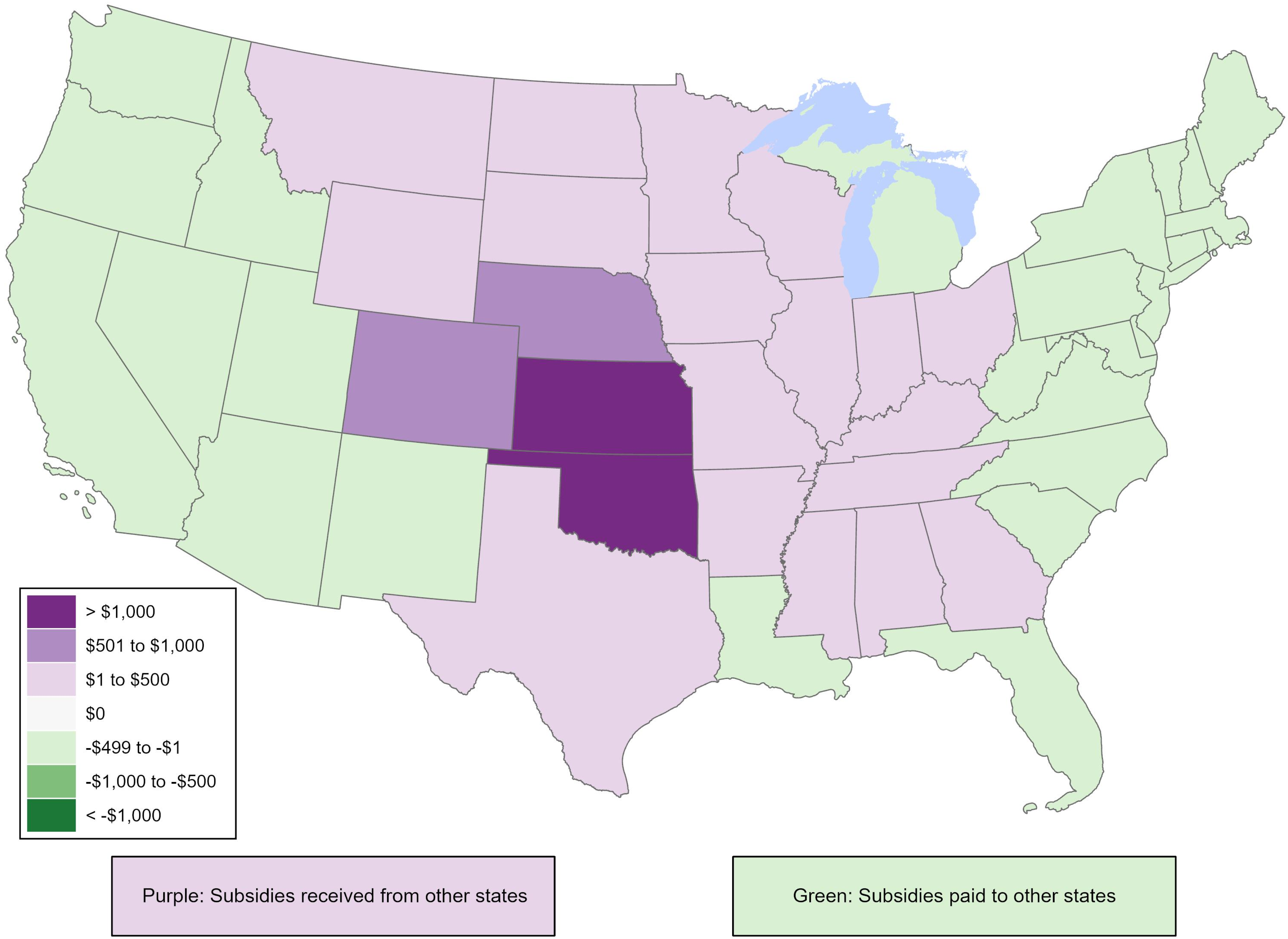
Unsubsidized Premium by Peril: All Perils Combined



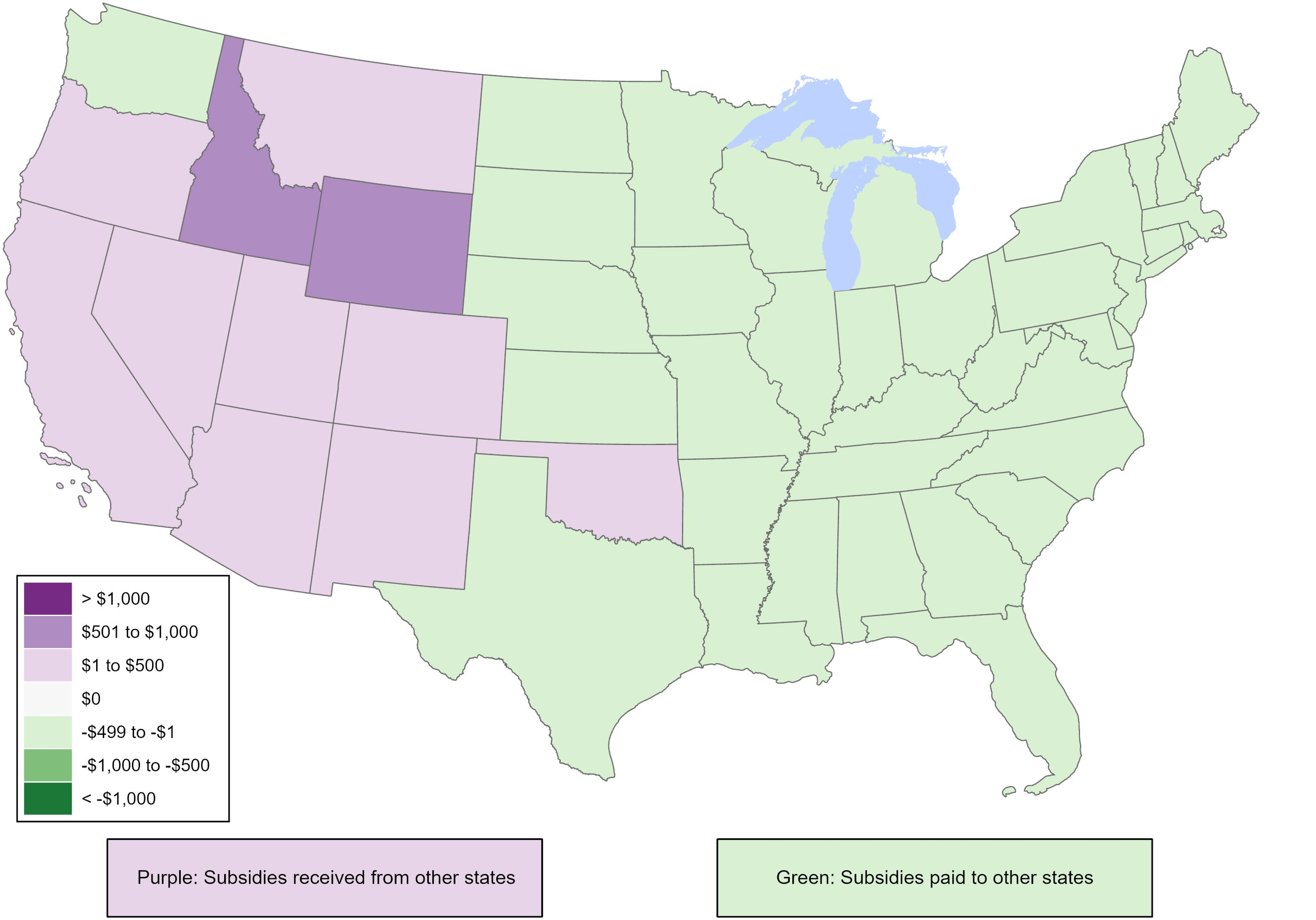
Cross Subsidization by Peril: Hurricane Wind



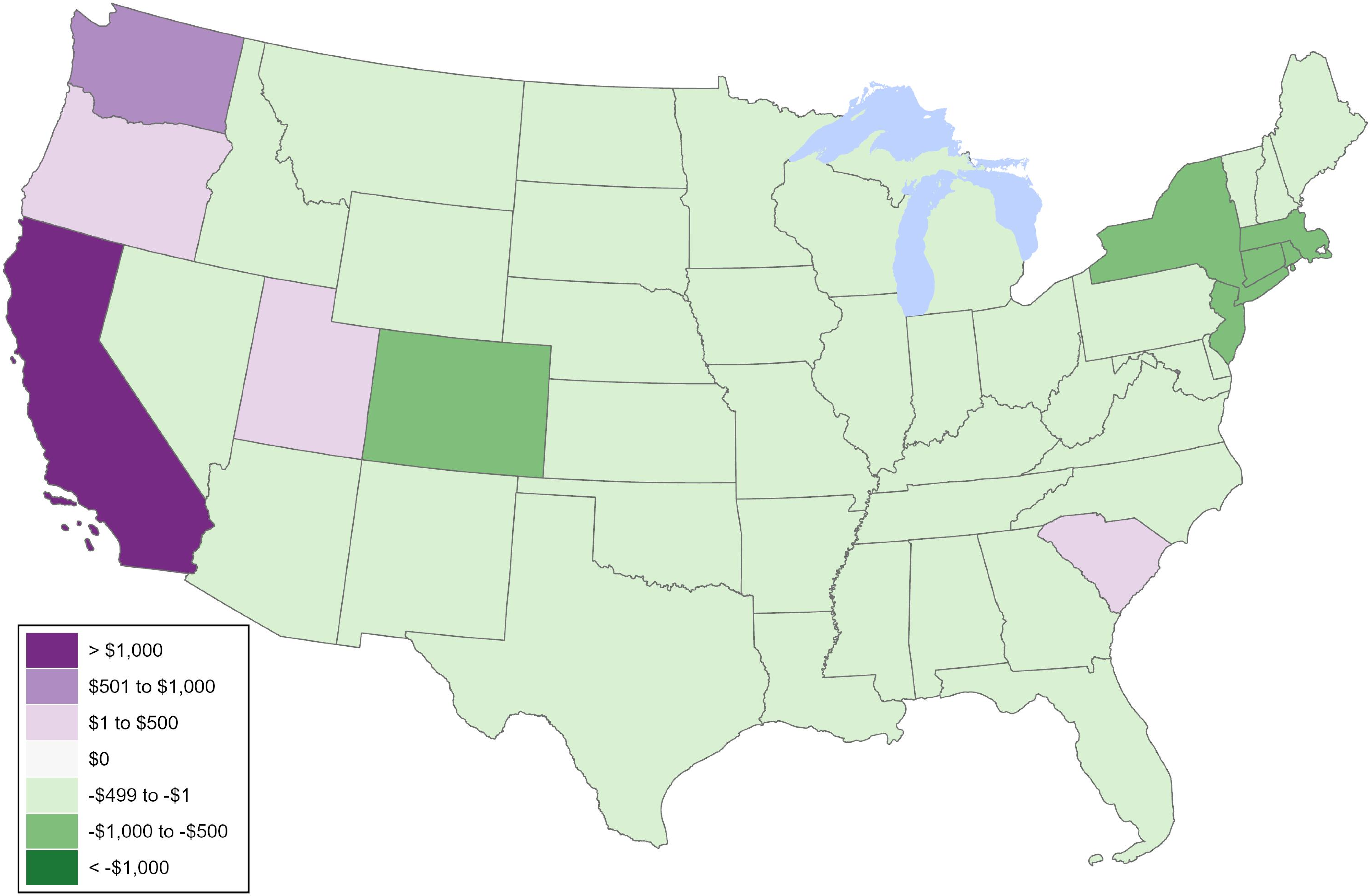
Cross Subsidization by Peril: Severe Convective Storm



Cross Subsidization by Peril: Wildfire



Cross Subsidization by Peril: Earthquake

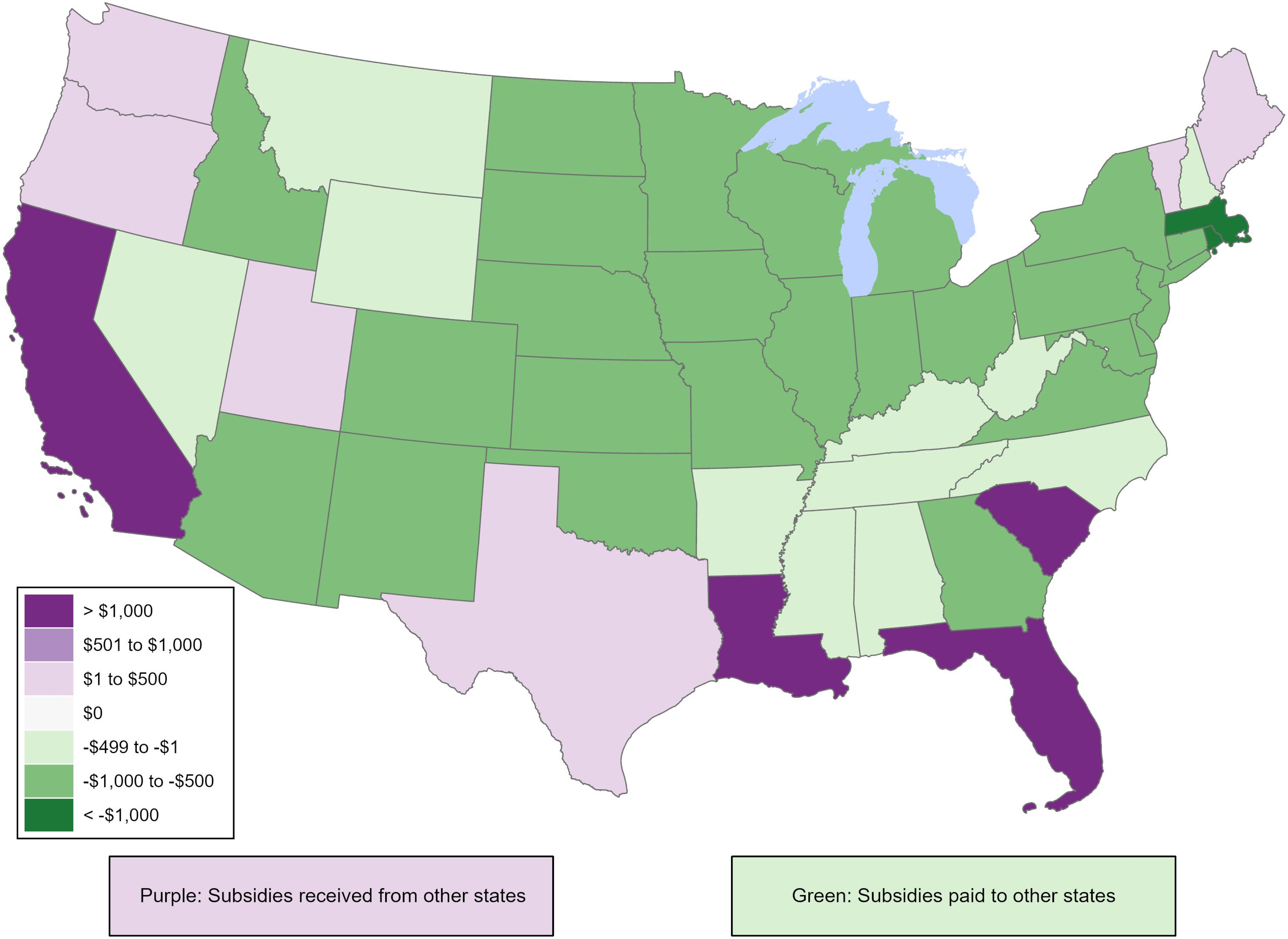


Purple: Subsidies received from other states

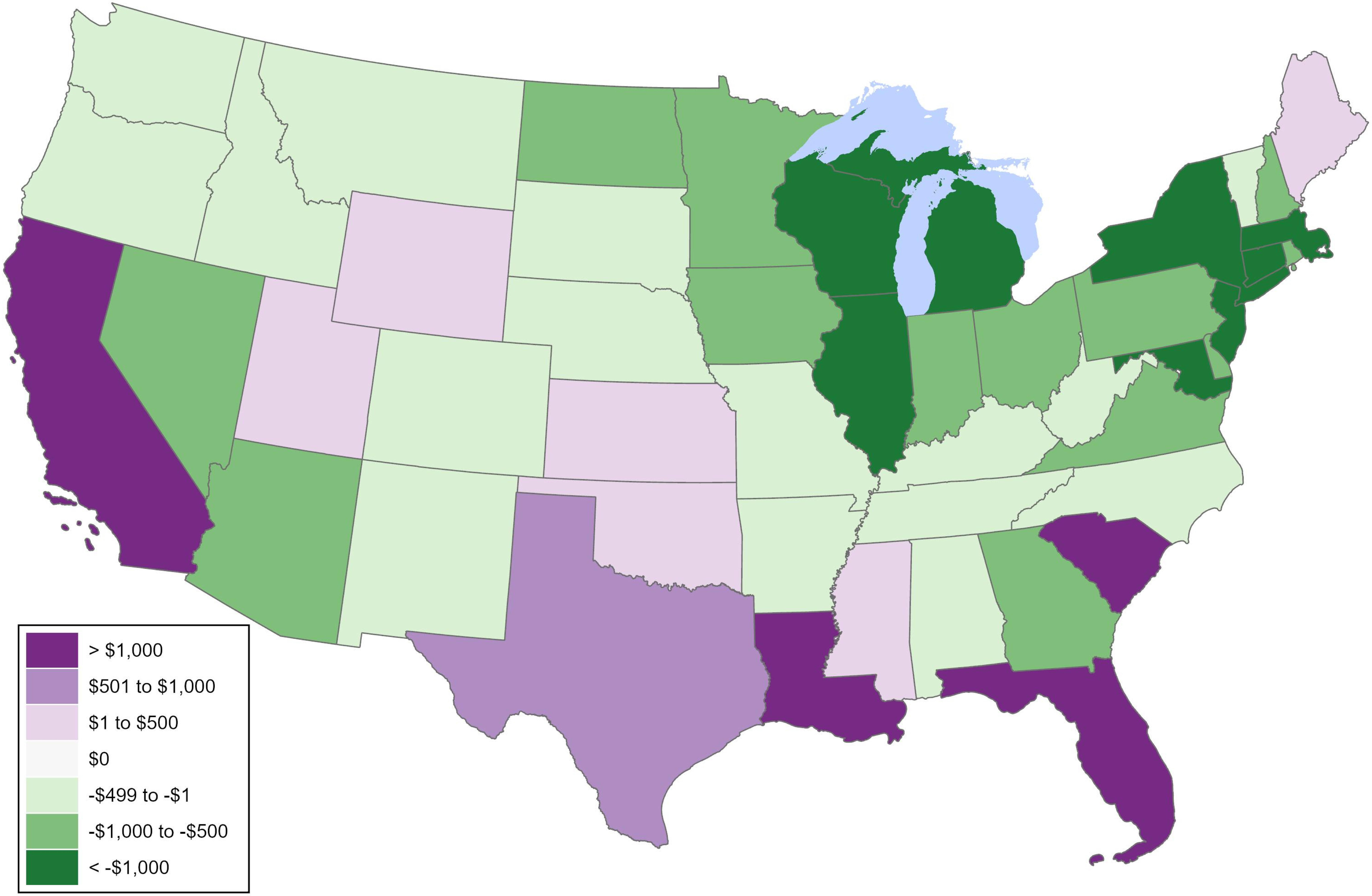
Green: Subsidies paid to other states


Cross Subsidization by Peril: Flood
> $1,000
$501 to $1,000
$1 to $500
$0
-$499 to -$1
-$1,000 to -$500
< -$1,000
Purple: Subsidies received from other states
Green: Subsidies paid to other states

Cross Subsidization by Peril: Earthquake and Flood



Cross Subsidization by Peril: All Perils Combined



Purple: Subsidies received from other states

Green: Subsidies paid to other states

Increase in Premium Burden After Mandating Subsidized Flood and Earthquake Coverage