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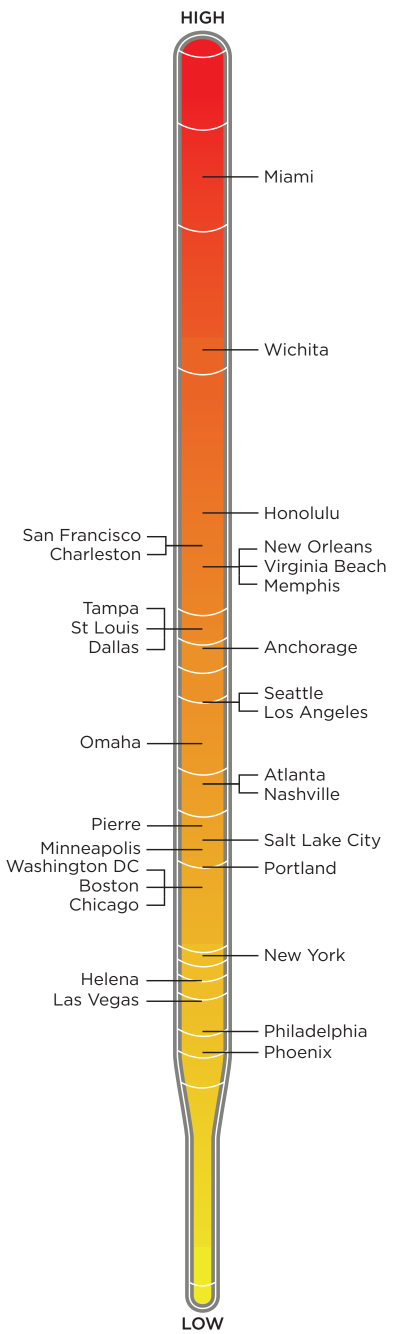

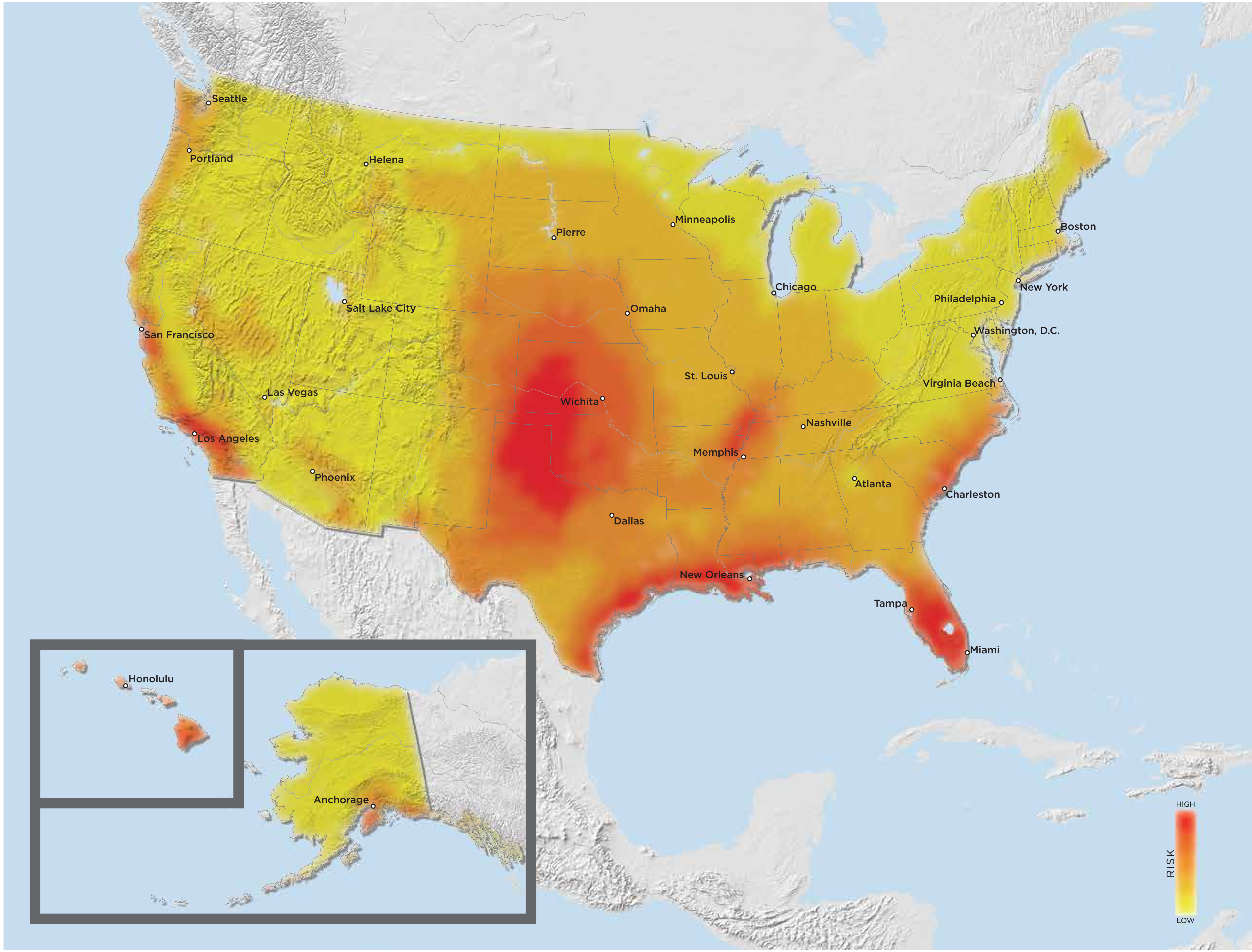

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CATASTROPHIC RISK IN THE UNITED STATES

Overall Risk

On average, the U.S. property and casualty industry pays approximately $20 billion in catastrophe-related claims per year. RMS catastrophe models synthesize the latest science, data, and engineering knowledge, along with 25 years of catastrophe risk research, to analyze the likelihood that a disaster will cause damage at a location, and how severe that damage could be.

The Big Picture

This map illustrates the overall risk from the most damaging natural hazards in the United States: earthquake (ground shaking and fire), hurricane (wind and flood), severe convective storm (tornado and hail), winter storm (snow, ice, and wind), wildfire, and volcano. All map data is derived from RMS catastrophe models and loss assessments.

Risk is expressed on a scale from low to high, with select U.S. cities highlighted on the “risk thermometer” to illustrate relative risk across the country. The map includes some of the nation’s most significant catastrophes to provide an additional historical perspective.

Risk vs. Hazard

Simply defined, a hazard is a source of potential damage or harm, while risk is the probability that a hazard will cause damage or harm. Hurricane winds are a hazard, while the probability of those winds damaging a property is a risk.

Hazard maps and risk maps look similar, but tell different stories. A typical hazard map indicates the probability that a peril will strike a location, and how severe that peril’s effects could be. RMS risk maps illustrate the probability that a hazard will cause property damage at a location, and how that damage translates into loss.

Quantifying Catastrophe Risk

RMS catastrophe models quantify risk using the "pure premium," which is an estimate of the annual insurance premium needed to cover losses from the modeled perils over time. The pure premium estimate evens out the influence of year-on-year extremes and allows a direct comparison of the potential damage and loss from a range of perils.

For example, over time, the cumulative losses at one location from frequent, lower-severity events such as hailstorms may be similar to—or even exceed—the loss at another location from a higher-severity but less frequent event, like a hurricane.

Also, regions that have experienced a recent catastrophe are typically better prepared for future, similar events, as they tend to enforce stricter building codes and construction practices than areas that have not experienced such an event. Such mitigating strategies help to lessen a catastrophe’s impact, sometimes causing risk to be lower than in regions populated with more vulnerable homes.

To establish a common baseline for comparative risk assessment, the pure premium estimate is normalized to a constant unit of property exposure—a uniform building with an insured value of $1,000. The resulting “loss cost,” represented as a dollar amount per $1,000, allows for direct comparisons of risk severity.

By removing the influence of property value or population density on loss results, the loss cost reveals a region’s risk from the peril in question. The loss from a hurricane in Miami, Florida will be much greater than that of a hurricane in a small town nearby, but their relative risk will be similar.

Regions that experience frequent, damaging perils have a higher relative loss cost than regions where severe events are rare. For example, the loss cost for earthquake risk in San Francisco is approximately $3 to $5 per $1,000 of property exposure. Along the Louisiana coast, the hurricane risk loss cost is much higher, at about $20 to $25 per $1,000 of property exposure.

Interpreting the Risk

The apparently negligible losses in some areas of the country do not necessarily imply an absence of risk. Rare, extreme catastrophes are “tail risk” events that can cause significant loss anywhere within the United States. A large earthquake in New York is a possible but improbable scenario that would be devastating.

Note that the map represents the natural hazards that RMS models, and does not include, for example, precipitation-induced flooding. However, RMS does model hurricane-induced storm surge flooding, which drives the majority of flood risk in the United States.