

Special Report

**Deciphering Flood:**  
A Familiar and Misunderstood Risk



# Deciphering Flood:

## A Familiar and Misunderstood Risk

Among natural disasters, floods are the most common,<sup>1</sup> but from an insurance standpoint, often the least understood. Floods can strike almost anywhere when heavy rains fall—in densely populated cities like Houston, in normally dry areas in the West, and along rivers and streams throughout the country. Floods may slowly inundate an area as rain falls day after day, or sweep through in a flash from a distant storm. The changing flood insurance market can be just as hard to understand as the peril itself. Despite the rising risks of floods, the exposure remains difficult for insurers to quantify, and many underwriters have been blindsided by unexpected losses. The industry's unease is reflected in the fact that flood pricing has held steady despite the overabundance of capital that has depressed the rest of the property market.

Still, the flood market is evolving as the private sector is poised to take on more of the risk. Better analytical capabilities are playing a significant role. Modeling firms now provide more powerful tools that allow insurers to better assess the risks they are writing and their own accumulations. Flood models also enable brokers to help customers better understand and manage their own flood risks. The evolving nature of the flood market makes it important to understand the coverage terms and response mechanisms, the factors driving market trends, and how flood models and other developments may impact capacity and pricing going forward. As always, expertise is crucial when navigating complex insurance markets.



## HOW BAD IS IT?

In the first few months of 2017, California was drenched by “atmospheric rivers” that overflowed once-parched reservoirs and forced the evacuation of more 180,000 people near the Oroville dam in the northern part of the state. The city of San Jose suffered more than \$70 million in damages from the worst floods in a century after water was released from an overflowing reservoir.<sup>4</sup> In 2015, South Carolina experienced a 1,000-year rainfall—the sixth such deluge in the United States since 2010, USA Today reported, including 2010 floods in Tennessee, and Hurricane Irene in 2011, which caused massive flooding in rural Vermont.<sup>5</sup> The rain that fell in Texas over the month of May in 2015 was enough, by some estimates, to cover the entire state with nearly eight inches of water.<sup>6</sup>

# The Rising Danger of Flood

In recent decades, greater development of areas susceptible to flooding—in coastal areas and on river flood plains—has increased the buildings and property values at risk, particularly in the South and West. Those regions have seen their population grow more than 20 percent since 2000, compared with less than 5 percent for the Northeast.<sup>2</sup> Over the last three to five decades, the risk of inland flooding has increased along with heavy downpours, the National Climate Assessment has reported, and the heaviest rainfall events have become heavier and more frequent.<sup>3</sup> Inland floods cause more damage each year than any other severe weather event, the report states.

Along with changing weather patterns, aging infrastructure heightens flood

risks. Of the roughly 90,000 dams in the country, about 30 percent show significant to high hazard potential, the U.S. Army Corps of Engineers estimates.<sup>7</sup>

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The near-catastrophe at Oroville underscores those dangers. Flooding has long been a worry in coastal areas susceptible to powerful hurricanes, but concern is growing in non-coastal states.

# Flood Coverage Stands Apart

At a basic level, most primary flood insurance is provided through the National Flood Insurance Program (NFIP), which offers commercial buyers limits of \$500,000 each for the building and its contents for non-residential properties, but only \$100,000 for the contents of larger residential properties. The program, however, has struggled with massive losses due in large part to Hurricanes Katrina, Rita and Sandy, and has borrowed heavily from the U.S. Treasury.

## More on the NFIP

The U.S. Government Accountability Office has kept the NFIP on its High-Risk List since 2006 and estimated in February 2017 that the NFIP was unlikely to generate sufficient revenues to repay the \$24.6 billion it owes to the Treasury.<sup>89</sup> The NFIP's current reauthorization ends Sept. 30, 2017, and some legislators have called for substantial reform.

A bill designed to encourage more private coverage for flood was reintroduced in Congress in March 2017. The Flood Insurance Market Parity and Modernization Act would make private policies acceptable for federally backed mortgages.<sup>10</sup> The private sector has already been showing greater interest in flood. Munich Re, for instance, announced a U.S. inland flood insurance product in 2015 for homeowners in low-to-moderate hazard flood zones.<sup>11</sup> Even the Federal Emergency Management Agency (FEMA), which manages the NFIP, has turned to the private sector. FEMA first secured \$1 million in reinsurance in September of 2016, and followed that with a \$1 billion placement in January of 2017.<sup>12</sup>

Of course, excess markets have long provided coverage for businesses above the NFIP limits, but businesses must still purchase the primary coverage. All-risk policies often include some flood coverage, but higher limits generally require stand-alone policies.

Another crucial consideration is that unlike windstorm, excess flood coverage is on an aggregate basis. That is, the policy generally pays for losses up to the limits once during the policy period and not per occurrence. A company that suffered repetitive windstorm losses in a busy hurricane season would be able to recover losses up to the limits for each of those storms, but if an insured exhausted its flood limits on one flood, they would not have coverage for another flood during that policy period. This distinction is crucial for companies insuring portfolios of properties.

# Flood Models Help Demystify the Risk

From the very beginning, insurance has been a data-driven business relying on past experience to gauge future risk. The development of catastrophe models, starting with hurricane models in the 1980s, has enabled insurers to more accurately estimate potential future losses. Exponential increases in computing power have made these models ever more powerful. Today, modeling systems cover not only wind, but earthquake, tornados, and hail. Inland flood is the newcomer. Some of the impetus for greater use of inland flood modeling tools comes from rating agencies, which want insurers to be able to provide a more detailed explanation of their flood risk accumulations, particularly in conjunction with a major windstorm.

From a risk management perspective, more in-depth analysis can identify properties that may require greater physical flood protection measures. For property owners, potential losses center around the value of the building and its contents and the length of time that the property is likely to be impacted. An extended shut-down may cause the greatest financial loss, followed by damage to the contents of the building and then the structure.

The AIR and RMS tools enable property owners to structure their insurance programs more efficiently by differentiating the most risk-prone locations from those facing less severe risks. This tiered risk sorting enables a more cost-effective combination of NFIP and private insurance on both a stand-alone and portfolio basis. Detailed inundation data may make it possible to challenge a property's designation within a Special Flood Hazard Area subject to severe 100-year floods. Greater modeling capabilities may also address the uncertainty among insurers when it comes to pricing flood as the lack of detailed analysis has tended to support higher prices.

## MODELING - HOW WE GOT HERE

Until recent years, flood zone analysis was limited to FEMA flood zone maps, which place locations on 100-year and 500-year floodplains, with Zone A representing Special Flood Hazard areas. Often, those maps are not updated until after a new flood. In contrast, the analytical tools now available provide far more detailed calculation of risk—and pricing—than is possible with a single letter code from a map that may be out of date.

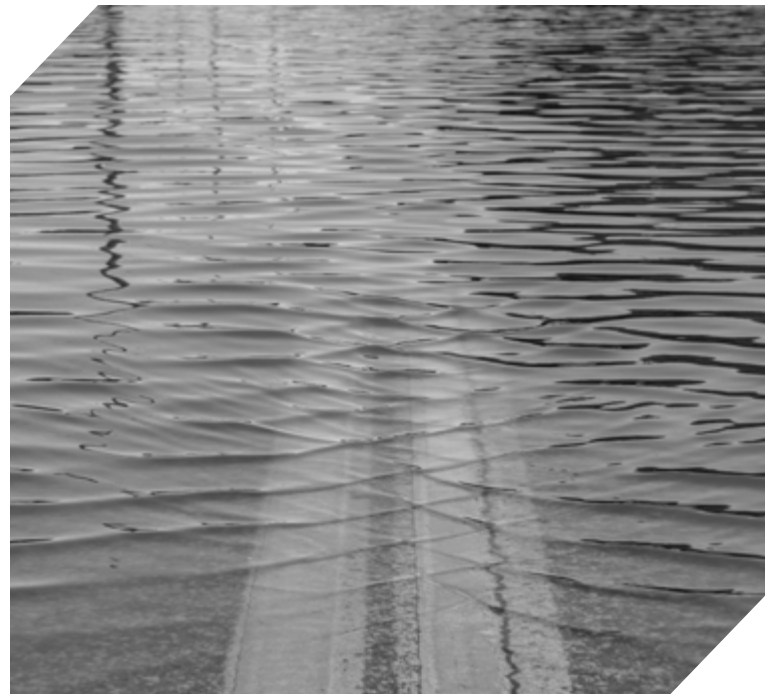
The first inland flood model was introduced in 2014 for the United States by AIR Worldwide.<sup>13</sup> That model builds on data including several millions of miles of rivers, tens of thousands of bodies of

water and thousands of miles of levees. The AIR model allows analysis of specific locations as well as groups of locations and calculates financial losses.

Modeling firm RMS, which was expected to release its own flood model in 2017, offers exposure analysis to enable a more complete picture of flood vulnerability. The RMS High Definition Flood Maps provide actual inundation depths at specified locations for 100 and 500-year events. RMS data also shows how flood protection, such as levees and berms, mitigates water levels. Both AIR and RMS analyze precipitation as a risk, and RMS includes storm surge.

# An Island of Stability

In comparison to other property coverages, flood has resisted the steady price declines of recent years. Even with plenty of capacity in the excess and surplus markets, insurers are standing firm on flood. Because of that, flood coverage may draw a lot of initial interest, but less take-up as potential buyers discover the cost. As a stand-alone peril, flood is generally more expensive than clients anticipate. For that reason, it's often wrapped into an all-risk policy.



Demand for excess flood is often driven by the need to acquire coverage above the \$500,000 NFIP limits. That may be due to a property owner recognizing a greater flood exposure, or because lenders require additional coverage or business interruption limits for properties, such as an apartment building or a commercial building with many tenants. The NFIP does not provide business interruption coverage. In addition, flood coverage provided as part of a package may be insufficient for the exposure.

While stand-alone pricing remains stable, domestic surplus lines carriers are showing a willingness to include flood with their all-risk quotes, which can provide some leverage in price negotiations. At higher layers, more capacity may be available from new programs and facilities. Among insurers, prices quotes may vary significantly, but buyers may still experience sticker shock compared to other property coverages. Insurers may be willing to offer higher limits rather than a lower deductible. Efficiencies may also be achieved when adding in business interruption and other coverages, such as ordinance and law or earthquake.

# Expertise Makes the Difference

When it comes to flood risks, experienced brokers provide the expertise needed to ensure that the insurance matches the actual exposure and that it will provide the intended coverage. Providing detailed data is crucial. Underwriters remain cautious about flood and will evaluate each individual exposure by location and elevation.

This attention to detail is also key for properly structuring a flood program. Excess coverage needs to follow the terms and conditions of the primary policy. Buyers should be aware of the potential for coverage erosion from other locations, that is, a loss at another location may use up the limits of the entire program if it is not structured properly. Expertise also comes into play in dealing with how individual carriers pinpoint risk on a flood map as small differences in the identified elevation can result in large differences in premiums.

Modeling capabilities that provide greater detail can prove useful not only in dealing with insurers but also for buyers. Models offer property owners a more detailed picture of their risk and help identify which mitigation efforts should be considered. Better data provides an advantage when it comes to securing any property coverage, but is crucial when it comes to developing a better picture of flood risks. Brokers with a track record of using data to build more effective programs can provide valuable guidance. The uncertainty surrounding flood risks and coverage makes the market particularly challenging, but experienced brokers can help navigate the shifting currents.



For more information, contact your CRC, CRC Swett or SCU broker.  
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**[crcins.com](http://crcins.com), [crcswett.com](http://crcswett.com) or [scui.com](http://scui.com).**

# Endnotes

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