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CoreLogic® 2012 Natural Hazard Risk Summary and Analysis

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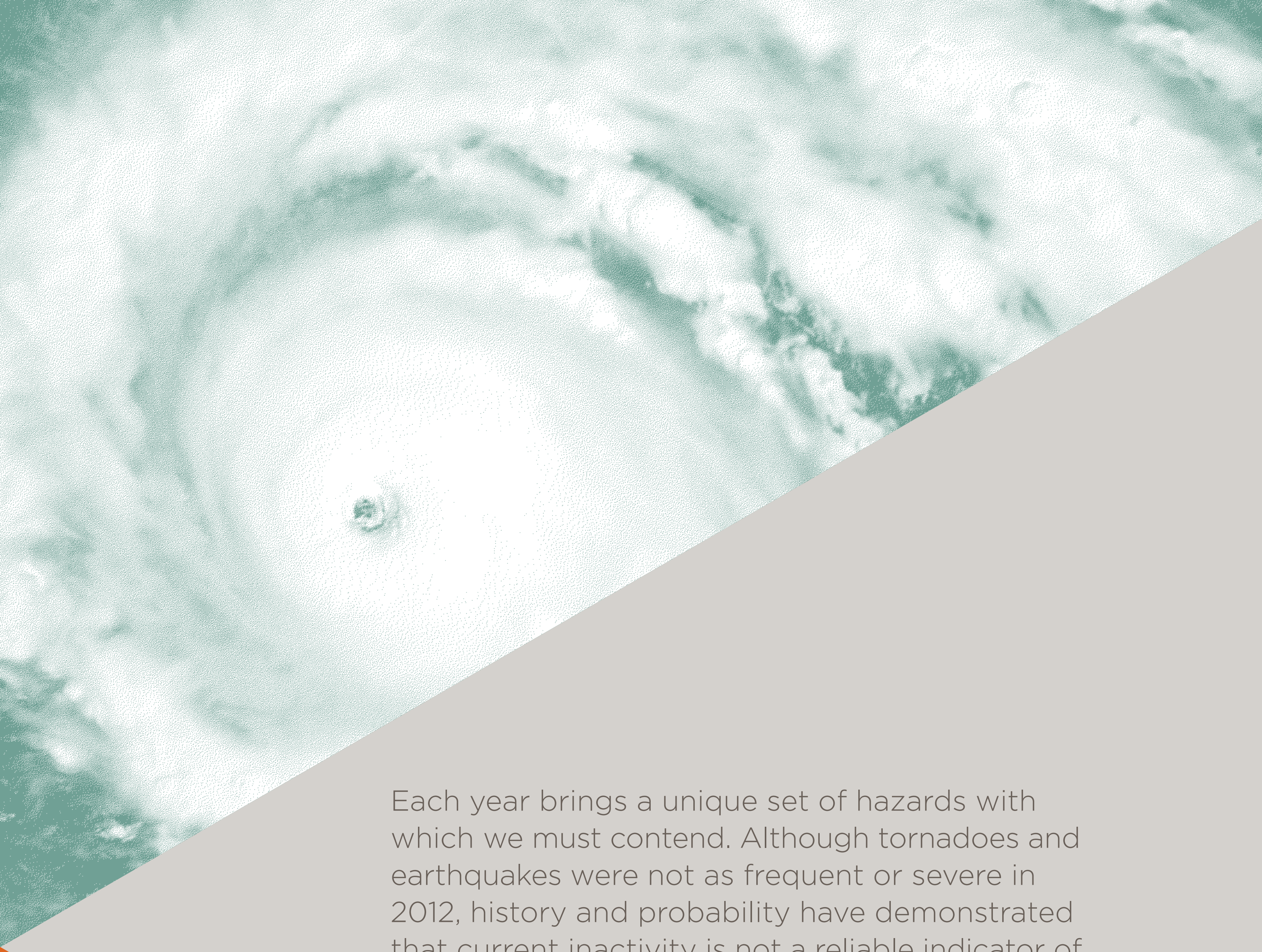

Each year brings a unique set of hazards with which we must contend. Although tornadoes and earthquakes were not as frequent or severe in 2012, history and probability have demonstrated that current inactivity is not a reliable indicator of future inactivity. The ability to accurately identify the potential for each hazard is a key component in preparing for and mitigating the loss associated with these natural disasters.

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Executive Summary

2012 Natural Hazard Risk Summary and Analysis

After record-breaking destruction in 2011, natural disasters continued to cause extensive damage in the U.S. in 2012. Beginning with several major tornadoes in January, homeowners, city officials, emergency responders, insurers and many others faced severe hazard risk through the end of summer and into fall. Even as tornado activity eased in May, catastrophic wildfires, freshwater flooding and hurricane-driven storm surge hit homeowners across the U.S. and, in some instances, contributed to record amounts of damage and destruction.

Due to the cyclical nature of some natural hazards, and the apparently random patterns of occurrence of others, the specific types of disasters that caused the most destruction in 2011 did not necessarily carry over to 2012. However, there is one common factor from one year to the next. Hazard-driven property damage and loss can and does occur every year. As such, the ability to accurately identify residential properties, ZIP codes and larger geographic areas vulnerable to each type of hazard is crucial to understanding and managing risk.

The single-most destructive disaster in 2012 was, without a doubt, Hurricane Sandy. With a wind field nearly 1,000 miles across, pushed by maximum winds of 90 mph, Sandy generated record levels of storm surge along the northern New Jersey coast and in the New York City area where the storm made landfall. While damages have yet to be fully tabulated, flooding and power outages across much of the region impacted more than 5 million residents. The damage to structures and infrastructure was certainly greater than last year's Hurricane Irene. An October 30, 2012 estimate from EQECAT, Inc. put insured losses at $10 billion to $20 billion and the total economic loss as high as $50 billion[1].

Wildfires also made headlines in 2012 as many states saw a continued trend of fewer, but larger fires. An expanded area of severe drought across more than half of the country contributed to fire activity in some regions, though states both within and outside the drought-affected areas experienced wildfire losses. Notably, Colorado witnessed two separate wildfires within a two-month period. Each led to a greater number of structures lost than in any previous fire in the state. As of early December, when this report went into production, total U.S. acreage lost to wildfire in 2012 was the third highest since 1960, with more than 9 million acres burned.[2]

Freshwater flooding incidents and tornado activity commanded attention in 2011, but less so in 2012. A decrease in flooding was to be expected based on historical flood trend data, which projected a year of relatively lower losses after a spike in 2011, and losses for the year were in fact trending downward until Hurricane Sandy struck the coast. Tornado activity started the year off with record-breaking destruction, much like the disasters recorded in 2011. Sporadic tornado outbreaks across the southern, eastern and central states from January through April of 2012 produced powerful storms. Affecting wide-ranging areas from Texas to Michigan and Nebraska to Alabama, the storms totaled as much as $2 billion in damage in more than a dozen states.[3] The months from May onward, however, saw an uncharacteristically low number of tornadoes causing relatively minimal damage.

The CoreLogic® 2012 Natural Hazard Risk Summary and Analysis provides a synopsis of the most significant catastrophic natural hazard events that took place in 2012. It also details a brief analysis of potential risk in the coming year and the implications of unexpected changes in natural hazard frequency, intensity and geographic patterns.

[1] Briefing: Modeling the Effects of Superstorm Sandy; EQECAT, Inc.

[2] National Interagency Fire Center (NIFC), 2012

[3] National Oceanic and Atmospheric Administration (NOAA), 2012

[4] NWS, 2012

[5] "By the numbers: Superstorm Sandy", CNN report, 11/3/2012

[6] Federal Emergency Management Agency (FEMA), 2012

[7] AIR Worldwide, 2012

[8] EQECAT Inc., 2012

SNAPSHOT — HURRICANE SANDY

Hurricane Sandy is estimated to have caused at least $50 billion in total damage.[4] While only a Category 1 hurricane, the width and timing of Sandy combined to affect hundreds of miles of coastline and the duration of the storm enabled it to impact areas as far inland as the Midwest. Record setting storm surge was a primary contributor to much of the damage, which included the interruption of electricity for millions, the flooding of subway tunnels and the damage or destruction of thousands of homes.[5] An estimated 72,000 homes were damaged by the storm in just the state of New Jersey.[6] The deaths of more than 100 people are attributed to the storm.[5] In comparison with Hurricane Irene in 2011, Sandy has demonstrated that it is indeed possible for a hurricane, even as a Category 1 storm, to at least temporarily cripple the largest metropolitan region in the country and easily run into the tens of billions in damage.

One clear contrast between Hurricane Isaac and Sandy is the difference in storm surge and flood protection provided by Louisiana and New York. While Isaac and Sandy were different storms in some ways, they were both Category 1 hurricanes as they approached the coast. And while the amount of damage would not necessarily be equal, the fact that Sandy is responsible for $50 billion in damage compared to the $2 billion estimated for Isaac may be at least partially related to the ongoing efforts to develop and enhance the flood prevention infrastructure along the Louisiana coast. In comparison, the metropolitan areas of New York and New Jersey have little to no flood mitigation infrastructure. Without flood barriers and flood control infrastructure, these urban areas cannot hope to evade the potential damage that can occur from these storms.

HURRICANES

Year in Review

The 2012 hurricane season, according to the National Oceanic and Atmospheric Administration (NOAA), was projected to be a "near normal" year with 12 to 17 named storms, four to eight hurricanes and one to three major hurricanes (Category 3 or greater which produces sustained winds between 111–129 mph). Ominously, hurricane activity began prior to the official start of hurricane season (June through November) with two tropical storms, Alberto and Beryl, forming near the end of May. Most of the tropical storms and hurricanes did not make landfall in the U.S., but the damage from those that did increased throughout the season. Of 19 named storms that occurred in 2012, five became Category 1 hurricanes, four became Category 2 and one was classified as a Category 3. Tropical Storms Beryl in May and Debby in June were responsible for some flooding in the Southeast, but generated little storm surge or wind damage. The first hurricane to make landfall in the U.S. in 2012 was Category 1 Hurricane Isaac in late August, coming ashore near New Orleans and causing an estimated $2 billion in insured losses.[7] However, late in the season, Isaac was dwarfed by a second hurricane, Sandy, which generated preliminary estimates of up to $50 billion in total economic damage.[8]

Notable Storms

TROPICAL STORM DEBBY: On June 26, Tropical Storm Debby came ashore approximately 150 miles north of Tampa on the Gulf Coast of Florida. With 40-mph winds, the storm moved slowly overland. Due to its relatively low wind speed it did not generate significant storm surge as it made landfall. However, Debby dropped 28 or more inches of rainfall in a few locations as it crawled slowly eastward across the Florida peninsula, resulting in severe flooding along its path. A mild storm by hurricane standards, it is estimated that Tropical Storm Debby still caused approximately $308 million in damage.[4] Much of the damage came from flooding that was exacerbated by the slow progression of the storm, generating precipitation totals of 15 to 17 inches in many areas.

Figure 1: Hurricane Isaac

Source: NASA's Earth Observatory, 2012

HURRICANE ISAAC: The first hurricane to impact the U.S. in 2012 was Hurricane Isaac, which made landfall in the New Orleans area on August 28 (Figure 1). Isaac was a Category 1 hurricane with a wide wind field comprised of 80-mph winds that tracked slowly as it moved inland, resulting in significant storm surge and rainfall.[9] The width of the storm, along with the slow progression, created a larger mass of water that resulted in storm surge of 12 to 14 feet, with some isolated areas experiencing even higher water levels.[10] The post-Katrina construction and enhancement of the levee and pumping systems in the New Orleans area served to protect some parts of the city, while other areas, such as Plaquemines Parish, may have experienced increased flooding due to the diverted surge water. The total damage caused by Isaac is estimated to be about $2 billion.[11]

Figure 2: Hurricane Sandy damage on the bay side of Seaside, N.J., Oct. 30, 2012

Source: (Governor's Office/Tim Larsen) New Jersey Governor's Office

HURRICANE SANDY: With the hurricane season winding down, the 2012 event of greatest significance was a Category 1 Hurricane that made landfall in the U.S. in late October. Hurricane Sandy formed in the Caribbean, strengthened to a Category 2 storm prior to crossing Cuba, and then dropped down to a Category 1 before making landfall on October 29 near Atlantic City, N.J. Dubbed "Frankenstorm" by NOAA in the days leading up to landfall, Sandy had several uncommon characteristics that contributed to the estimated $50 billion in damage left in its wake. First and foremost was the size of the storm—the outer edges of Hurricane Sandy measured in excess of 1,000 miles across. Such a wide wind field meant damage from both wind and storm surge impacted a broad stretch of the coast. Secondly, the hurricane merged with a nor'easter resulting in a "superstorm" of sorts. The combination of both storms resulted in a longer-lived and larger storm front that moved westward across the New England area and eventually affected weather conditions in the Great Lakes region.

[9] The National Weather Service (NWS), 2012

[10] Army Corps of Engineers, 2012

[11] NOAA, 2012

A final parameter was the timing of the storm's landfall, which occurred during a high tide and full moon. This maximized water height during the main thrust of the storm surge. These three conditions were responsible for record storm surge in several areas, including a surge height of 13.7 feet at Battery Park in lower Manhattan.[12] Inland flood waters related to the surge flooded five subway tunnels, two Amtrak tunnels and three primary roadways.[13] Homes along the New Jersey coastline and New York's Staten Island and Long Island were not only flooded, but in some cases even moved completely from their foundations by the surge as they bore the brunt of the storm's force.

Implications and Projections

Hurricane Sandy, just one year removed from the devastation in the Northeast from Hurricane Irene, demonstrated the importance of preparation for events that are possible, even though they may not have a high statistical probability. While it is less likely a hurricane will approach the New York area, especially two years in a row, the Gulf and Atlantic coasts do experience hurricanes and tropical storms with regularity. Most of the coastal areas do not have levee systems in place, and virtually all coastal areas are attractive locations for residential development. Major coastal urban areas include Houston and Galveston, Texas; New Orleans, La.; Tampa and Miami, Fla.; Charleston, S.C.; Baltimore, Md.; New York, N.Y.; and Atlantic City, N.J. Clearly, Atlantic storms can threaten the homes and infrastructure of tens of millions of people. It does not require the most severe category hurricanes to incur major damage. As we have seen from Hurricane Irene in 2011 and Hurricanes Isaac and Sandy in 2012, even a Category 1 storm can easily destroy or damage thousands of homes and run up billions of dollars in total damage.

While levees can provide a certain degree of protection in designated areas, it is unlikely that the surrounding areas will be free from damage due to the increased volume of surge water that is redirected to the areas not protected by a levee system. In areas where levees do not exist, the potential risk extends for miles along the coast and inland as surge water is pushed on shore. As a result of Hurricane Katrina, the Federal government invested more than $14 billion to enhance the flood defense system in and around New Orleans. Levees, pumping stations, flood walls and other flood control infrastructure was installed or enhanced for the purpose of ensuring some degree of protection against future storms. When Hurricane Isaac hit, an improved levee system served to protect parts of New Orleans from extensive damage that might have otherwise resulted from hurricane-driven storm surge. Thankfully, as a Category 1 hurricane, Isaac did not generate the same level of storm surge that developed from Hurricane Katrina, a Category 3 storm. If Isaac had developed into a more powerful storm, the amount of surge and the resulting damage would likely have been much more devastating, as it would have potentially overtopped levees and inundated a larger area. Since the Gulf Coast is not immune to storms larger than Isaac, it is necessary to consider the impact and know the risk associated with a Category 2 or greater storm as well. While the extent of damage to Plaquemines Parish that may have resulted due to water redirected from neighboring levee systems has yet to be determined, it is important to note that storm surge can still be a concern in and around areas where protective systems have been implemented.

[12] NWS, 2012

[13] Bloomberg News, 2012

SNAPSHOT — TROPICAL STORM DEBBY

Tropical Storm Debby occurred just three weeks into the official hurricane season, but was the already the fourth named storm of the Atlantic hurricane season, making it the earliest fourth-named storm in the Atlantic since 1851. Following a west to east path across the northern half of Florida, Debby was characterized by extremely slow movement and heavy precipitation. Torrential rainfall and the resulting flash flooding and river flooding occurred in Wakulla, Leon, Franklin, Jefferson, Dixie and Lafayette counties. Maximum rainfall of more than 28 inches was reported in several locations, and an estimated 339 homes were damaged or destroyed due to flooding in Wakulla County.[14] The monthly statewide precipitation total for Florida reached 13.1 inches, a record amount that was nearly double the average June total for Florida. Overall, Debby caused an estimated $308 million in damage.[14]

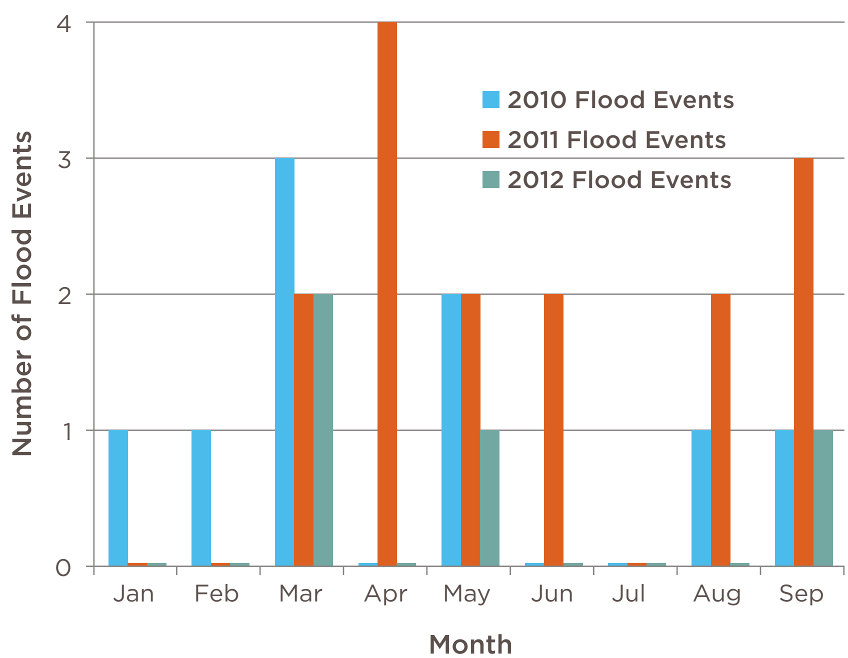
FLOODING

Year in Review

During the first nine months of 2012, freshwater flooding was not a significant source of damage in the U.S. January through September demonstrated a decline in flood losses compared to the previous year, due to an ongoing severe drought across much of the country and little opportunity for severe flooding events.[15] Through September, flood events that occurred were less frequent and had less impact than those in 2011.[16] The small amount of flooding occurring in conjunction with the remnants of Hurricane Isaac was welcomed in many areas due to the drought conditions at the time. Then, in late October, Hurricane Sandy devastated portions of the Mid-Atlantic and Northeastern U.S. with flood losses estimated at $8–10 billion and total damage potentially topping $50 billion.[15] This dramatic change in flood losses due to a single storm illustrates the importance of accurately assessing risk potential.

Prior to Hurricane Sandy, flood events in 2012 were relatively insignificant, with most of them occurring below the Federal Emergency Management Agency 100-year flood levels. As indicated in Figure 3, only March experienced a similar number of flood events compared to 2011. However, including Hurricane Sandy in a year-to-date evaluation, flood losses across the country are expected to total approximately $10 billion in 2012[17], which would result in the third consecutive year of increasing flood damage in the U.S.

Figure 3: Comparison of the number of flood events for 2011 and 2012



Source: CoreLogic 2012.

[14] NWS, 2012

[15] NOAA, 2012

[16] FEMA, 2012

[17] National Flood Insurance Program (NFIP), 2012

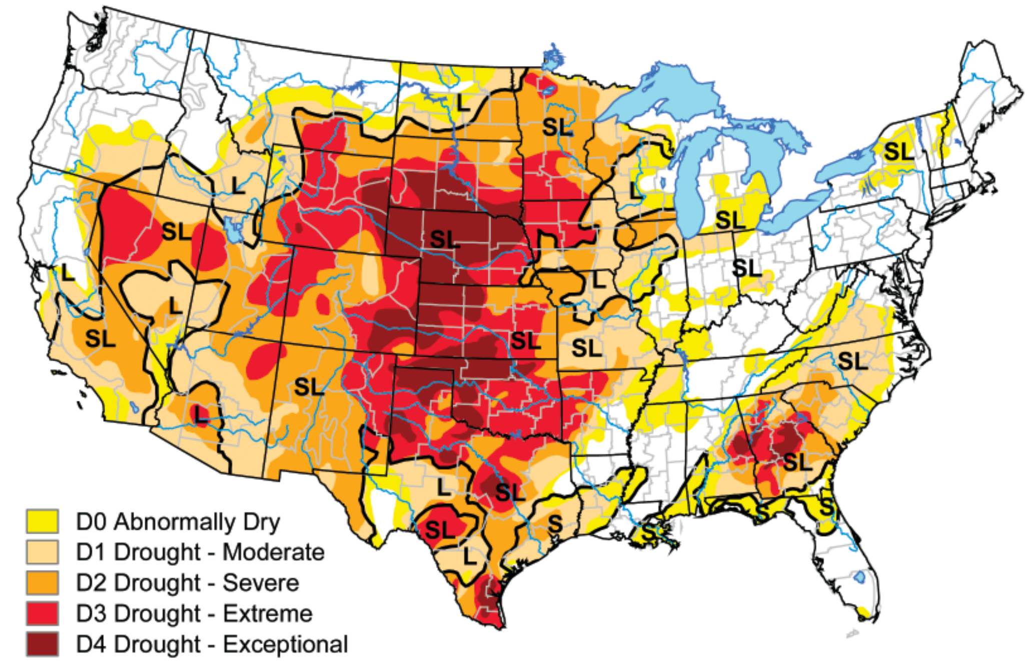
As the most significant flooding event of 2012, Sandy was a Category 1 Hurricane with three notable characteristics that contributed to severe damaging floods along the coastal areas of the central and northern Atlantic states: 1) The storm had a much wider-than-average reach at 1000 miles across, compared to the typical 200–300 miles width of a hurricane, 2) The storm merged with a nor'easter as it came on shore and 3) The timing of the landfall was unfortunate, striking at both high tide and during a full moon. As previously mentioned, these three factors combined to enable the storm to push the maximum amount of water onshore in the form of storm surge while at the same time, covering a tremendously wide area and also maintaining the high winds and surge for an extended period of time. Surge levels of nine to 10 feet or more pushed water levels to over 13 feet in some of the worst affected areas.[18]

Two other significant flood events in 2012 were related to Tropical Storm Debby and Hurricane Isaac. Debby, due to its slow progression across the Florida peninsula, created over 28 inches of rainfall in a few locations along its path that contributed to flooding in north Florida. Isaac brought heavy rainfall and flooding to Louisiana before continuing northward into the Midwest, where it was actually a welcome change from the ongoing drought that had been affecting the region.[18] Also notable was flooding in Duluth, Minn., where residents experienced 8 to 10 inches of rain over a three-day period in June that was estimated to have caused approximately $100 million in damage to the city's infrastructure.[18]

Drought

In parallel with the low levels of freshwater flooding in 2012, parts of the U.S. suffered the worst drought in more than 25 years. Figure 4 presents a snapshot of the United States Department of Agriculture (USDA) Drought Index on December 18, 2012, which depicts more than 50 percent of the country (1,692 of 3,143 counties) classified under "severe" or greater drought conditions.

Figure 4: Drought severity map for the contiguous U.S., December 18, 2012



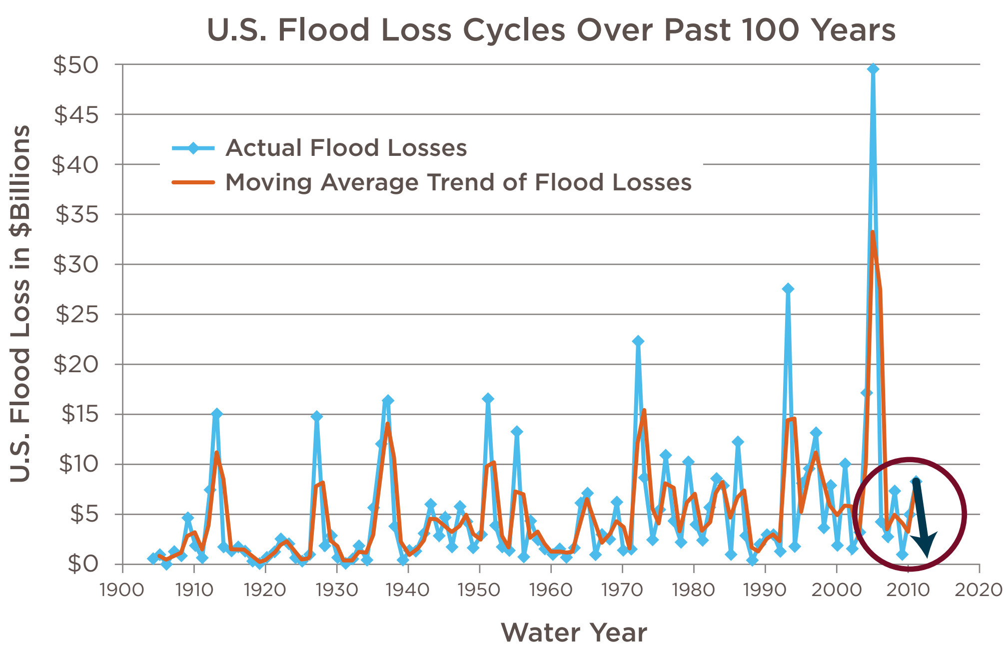
The U.S. Drought Monitor is produced in partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC-UNL.

[18] NWS, 2012

Implications and Projections

Based on a trend analysis of U.S. flood losses over the last 100 years, after the flood loss increases in three consecutive years from 2010 to 2012, flood disasters in 2013 will likely be trending downward compared to 2012 (Figure 5). The 2013 projection takes into account the historical flood-loss peak pattern and the El Niño cycle. An evaluation of historical loss patterns provides an insight into the cyclical nature of flooding. High and low loss cycles are not perfectly synchronized temporally, but it is clear that periods of high loss tend to follow sequential relatively low loss segments of the cycle. The El Niño/La Niña phenomena also contribute to the changing pattern based on their effect on atmospheric conditions and overall contribution to wet and dry periods in the U.S. As the most recent NOAA prediction indicates a progressive change from El Niño to La Niña conditions, it is more likely that the U.S. will experience more precipitation, in general, than 2012. Based on these factors, the 2013 total flood loss could reach approximately $6.5 billion. However, it is not likely that 2013 will deliver any above-average, extreme flood disaster events.

Figure 5: Historical U.S. flood loss and projection



Source: NOAA, 2012.

SNAPSHOT — 2012 COLORADO WILDFIRES

Over the course of four weeks during June and July, Colorado suffered its worst wildfire losses in history. Beginning with a lightning strike on June 9, the High Park Fire just west of Fort Collins burned more than 87,000 acres and destroyed 259 homes.[19] The fire caused the evacuation of 4,300 residents and was difficult to contain due to high temperatures, low humidity and winds. Just as progress was being made on combating the High Park Fire, another fire began on June 23rd northwest of Colorado Springs. The Waldo Canyon Fire, while only burning 18,000 acres, destroyed 346 homes and caused the evacuation of more than 32,000 people in and around Colorado Springs before finally being extinguished on July 10. During this four-week period, there were at least two dozen additional fires burning throughout Colorado.

WILDFIRES

Year in Review

As of early December, the 2012 wildfire season had been the third most destructive in terms of total acres burned in the U.S. based on records that date to 1960[20] (Figure 6). In addition, the 3.6 million U.S. acres that burned in the month of August represent the most acres burned for that month on record, according to NOAA.

The 15-year trend of fewer, but larger fires has continued into 2012 with fewer than 51,000 individual fires burning across the country.[20] Though this is the lowest number of fires recorded since 1989, those fires are responsible for the destruction of more than 9 million acres of land. The Long Draw Fire in Oregon (557,628 acres), which occurred in July, ranks seventh on the list of largest fires since 1997 (NIFC). August's Rush Fire on the California-Nevada border (315,577 acres), burned 271,911 acres on the California side of the border. It represents the second largest fire in modern California history since accurate record keeping began in 1932.[19] Also in August, the Holloway Fire (461,047 acres) burned 215,542 acres in Nevada and 245,505 acres in Oregon.[19]

Several of the individual fires that occurred in 2012 also set records, including Colorado's Waldo Canyon Fire just north of Colorado Springs. The fire damaged or destroyed 346 homes[19], making it the most destructive in Colorado history. The Waldo Canyon Fire surpassed the previous state record of 259 homes damaged set by the High Park Fire west of Fort Collins just several weeks earlier. Combined insured losses from both fires totaled nearly $450 million.[21] In New Mexico, the 156,000-acre Las Conchas Fire in 2011 had been the largest in state history until the 2012 Whitewater-Baldy Fire surpassed it in the early summer months of 2012, nearly double in size and totaling more than 297,000 acres burned.[19]

Figure 6: Total U.S. acreage burned by wildfire (by year) ranked by total acres burned

Year	Acres
2006	9,873,745
2007	9,328,045
2012	9,093,431**
2011	8,711,367
2005	8,689,389
2004	8,097,880
2000	7,393,493
2002	7,184,712
1963	7,120,768
1969	6,689,081

**As of November 15, 2012

Source: National Interagency Fire Center

In addition to record-setting wildfires in Colorado and New Mexico, many other states experienced significant wildfires in 2012 as well. Figure 7 identifies the top 10 states in terms of acreage burned in 2012. California, which had seen a dramatic decline in burned acreage over the past two years (averaging 117,000 acres between 2010 and 2011), moved up to fourth on the list with nearly 900,000 total acres burned for the year. Only two of the top 10 states lost less acreage to wildfire in 2012 compared to 2011. New Mexico and Alaska experienced less wildfire acreage, while the other eight states showed a dramatic increase in the amount of acreage burned.

[19] U.S. Forest Service Incident Information Website (InciWeb)

[20] National Interagency Fire Center (NIFC)

[21] Rocky Mountain Insurance Information Association, rmiia.org

As mentioned above, even though the number of wildfires continues to decline, the amount of acreage lost to fire continues to increase. A total of 14 individual wildfires 100,000 acres or larger occurred in 2012. Only 2006 (with 18) and 2007 (with 16) had more wildfires totaling 100,000 acres or larger. Idaho, Montana and Oregon, each with more than 1 million acres burned this year, topped the list based on sheer size and total amount (Figure 7).

Figure 7: Top ten states for wildfire acreage burned / number of fires in 2012

State	Acreage Burned	Number of Fires	# Fires > 100,000 ac
Idaho	1,680,113	1,143	5
Oregon	1,265,357	899	2
Montana	1,139,873	2,144	3
California	867,565	7,902	1
Nevada	614,122	1,005	1
Wyoming	434,062	752	0
Utah	416,218	1,527	1
New Mexico	372,741	1,001	1
Nebraska	316,000	147	0
Alaska	275,761	400	0

Source: National Interagency Fire Center (NIFC), 2012.

Implications and Projections

By all accounts, wildfire activity was extreme in 2012. The year marked only the third time since 1960 that more than 9 million acres were destroyed.[22] Based on total acreage burned, wildfire activity seems to be trending upward, given that eight of the 10 worst years for wildfire destruction have occurred since 2000 (Figure 6). While the actual number of wildfires has continued to decline, the amount of damage and area burned clearly has not.

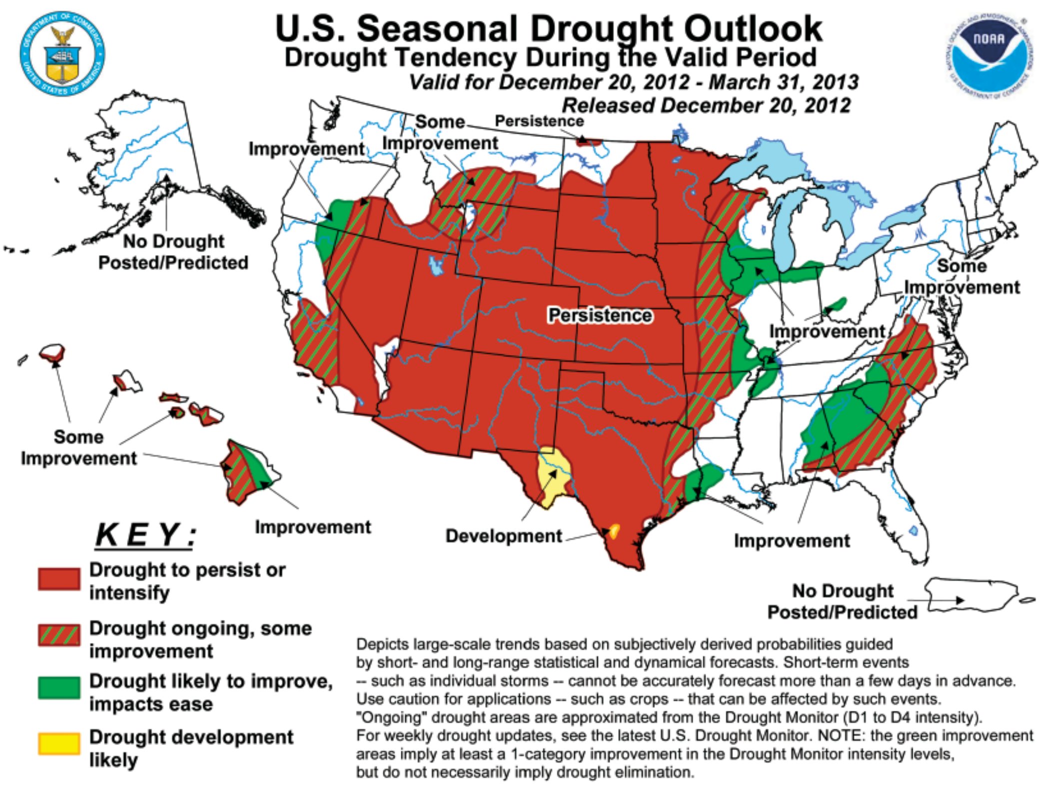
The ongoing drought that dominated much of the country in 2012 was one contributing factor to the total area burned. By the end of August, approximately 63 percent of the U.S. was classified as being in drought conditions, with Washington, Wyoming and Nebraska experiencing the driest August on record.[23] The rebound in wildfires that occurred in California in 2012, while not a result of drought conditions, was not unexpected and demonstrates the cyclical nature of wildfire in areas that have a historical record of frequent wildfire activity.

[22] NIFC, 2012

[23] NOAA, 2012

Due to a two-year period of wetter and cooler weather patterns prior to 2012, the vegetation that would normally burn more frequently was instead able to grow. Thus, it contributed a higher fuel load when weather conditions returned to a drier pattern, thereby intensifying the impact of recurring fires. The most recent U.S. Seasonal Drought Outlook Map (Figure 8) released by NOAA indicates a continuing pattern of drought conditions from the Midwest to the Pacific Coast through the start of 2013. Though this estimation does not yet extend into the spring and summer, when wildfire activity is at its peak, it does provide an indication of the potential for another increase in wildfire risk across much of the country should these drought conditions persist.

Figure 8: NOAA seasonal drought outlook, through March 31, 2013



SNAPSHOT — BIRMINGHAM TORNADO HISTORY

Birmingham, Ala. is not located in what is commonly referred to as "Tornado Alley," and is probably not traditionally associated with tornadoes by those living outside that region. However, based on a review of historical NWS data, destruction from tornadoes in and around the Birmingham area may rival that of any tornado-prone area in the United States. In April, 1956, an EF4 tornado passed north of the downtown area, killing 25 and injuring hundreds as it destroyed approximately 400 homes in the area (NWS). In April, 1977, an EF5 tornado passed through the same area, killing 25 and causing an estimated $25 million in damage.[24] In April, 1998, another EF5 tornado followed a similar path west and north of Birmingham, killing 32.[24] More recently, in 2011 and in 2012, storms again ravaged this area. In April, 2011, an EF4 developed and did a tremendous amount of damage in the Birmingham and Tuscaloosa area, resulting in 64 deaths and approximately $2.2 billion in damage.[24] Finally, in January of 2012, an EF2 passed west and north of Birmingham, causing approximately $30 million in damage and killing two people.[24]

TORNADOES

Year in Review

It is certain that 2011 will be long remembered for the sheer number of tornado outbreaks and resulting damage that occurred in many parts of the U.S., and 2012 began with similar heightened activity. January 2012 was one of the most active Januarys on record, since these numbers were first tabulated beginning in 1950, with a total of 79 tornadoes reported across the country (Figure 9). The first three months all saw higher than average numbers of tornadoes, with March experiencing more than double the three year average (2009–2011) with 154 tornadoes for the month.

The early outbreaks continued the trend that began in 2011, but starting in April, the number of tornado touchdowns dropped well below monthly averages for the remainder of the year. In fact, July saw the fewest tornadoes of any July since 1951. The amplified effects of the drought over much of the U.S., which limited tornado-forming storm cells, are a likely contributing factor to the lower totals for the summer and fall.

Figure 9: 2012 total number of tornadoes by month

Month	# of Tornadoes 2012	# of Tornadoes 2011	3 Year Average (09-11)
January	79	16	17
February	57	63	33
March	154	75	74
April	206	758	371
May	121	326	279
June	108	160	251
July	37	103	122
August	40	57	57
September	45*	51	39
October	41*	23	65
November	4*	44	39
December	0**	15	34

Source: NOAA 2012 Annual Severe Weather Report Summary

*Preliminary data based on number of observations, not confirmed by NOAA as of the publication date.
**Incomplete data for December due to publication prior to final count.

Drawing more similarities to 2011, the tornado activity in 2012 was not strictly limited to the region commonly referred to as "Tornado Alley." States located outside the central and southern Great Plains experienced a significant number of tornadoes this year, as well as an increased share of the more destructive storms (Figure 10). Some of the most destructive tornadoes include the January 22 to January 23 outbreak of tornadoes in Alabama, which caused at least $30 million in damage when it struck some of the same areas, including Oak Grove, Alabama, which were devastated by the April 27 outbreak in 2011.[25]

[24] NWS, 2012

[25] NOAA, 2012

[26] NOAA National Climatic Data Center (NCDC)

Over a two-day period in late February, tornadoes struck Illinois, Indiana, Kentucky and Ohio. Harrisburg, Ill., experienced the most concentrated destruction, with an EF4 tornado that damaged or destroyed more than 225 homes and businesses, causing an estimated $475 million in total damage.[25] Based on the Enhanced Fujita (EF) scale, an EF4 tornado generates winds between 166 and 200 mph. With the Enhanced Fujita scale ranging from EF0 to EF5, the Harrisburg tornado was one of the most destructive storms possible. Other tornado outbreaks occurred in disparate locations such as Huntsville, Ala.;, Dallas and Austin, Texas; and as far east as Virginia and Maryland.

Figure 10: States with 30+ tornadoes in 2012
(States in orange are not traditionally considered to be part of "Tornado Alley"[26])

State	# Tornados 2012*
Kansas	145
Texas	106
Kentucky	65
Alabama	63
Mississippi	54
Nebraska	48
Oklahoma	41
Louisiana	40
Illinois	39
Florida	37
Minnesota	37
Tennessee	37
Indiana	33
Missouri	32

*As of November 24, 2012

Implications and Projections

Tornado formation is the result of specific weather conditions that are not easily predicted far in advance. It has been suggested that the drought conditions that dominated the midsummer months served to minimize the opportunity for the formation of tornadoes, which could explain the dramatic drop in tornado incidents in the later months of 2012 following a highly active start from January through May. Given the continuing drought conditions throughout much of the central U.S. in the latter months of 2012, it is reasonable to expect that tornado activity will remain at a lower level through 2013 if these conditions persist.

DISCLAIMER:

The data in this report represents CoreLogic's analysis and interpretation of potential natural hazard risk in the United States. It is based on publicly available information combined with CoreLogic internal research and application of CoreLogic proprietary tools and information. It is not meant as a probabilistic evaluation of the potential for a natural hazard to occur or to address the risk determination of any particular property. CoreLogic recommends that specific analysis be performed at the property level to adequately determine the likelihood of risks for an individual parcel of land.

The data cited in this report are accurate as of the publishing date, which occurred prior on December 31, 2012.

Conclusion

Each year brings a unique set of hazards with which we must contend. While the events of 2012 have already been recorded, the coming year is now of most interest. The ability to accurately identify the potential for each hazard is a key component in preparing for and mitigating the loss associated with these natural disasters.

Although flooding and earthquakes were not as frequent or severe in 2012, history and probability have demonstrated that current inactivity is not a reliable indicator of future inactivity. California wildfires in 2012 proved that low activity in 2010 and 2011 did not represent the potential threat. Similarly, tornado activity in 2012 provided an example of how quickly a hazard can change in frequency, with several months of high frequency events immediately followed by minimal activity. Then there is Hurricane Sandy. Although located outside the Gulf Coast/Southern Atlantic region considered most susceptible to tropical storms, Sandy showed that the northern Atlantic Coast can indeed experience such events not only in consecutive years, but also at levels of unprecedented severity. Evaluating risk in the areas in which events are more common only reveals part of the solution. To understand the risk associated with natural hazards, it is important to obtain a full and accurate representation of risk in both the short-term and long-term and across all potential areas of occurrence.

And while hazards tend to occur in the traditionally accepted areas, such as wildfires in California and floods along the Mississippi River, it is just as important for insurers, homeowners, businesses and emergency responders to develop a more comprehensive evaluation of risk that includes typically non-traditional locations. Natural disasters occurring over the last few years have demonstrated that preparation for these events will ultimately result in saving money and lives.

For more information about the data and analytics contained in this report or on CoreLogic natural hazard risk solutions, please contact us at hazardrisk@corelogic.com or at 855.267.7027

ABOUT CORELOGIC

CoreLogic (NYSE: CLGX) is a leading property information, analytics and services provider in the United States and Australia. The company's combined data from public, contributory, and proprietary sources includes over 3.3 billion records spanning more than 40 years, providing detailed coverage of property, mortgages and other encumbrances, consumer credit, tenancy, location, hazard risk and related performance information. The markets CoreLogic serves include real estate and mortgage finance, insurance, capital markets, transportation and government. CoreLogic delivers value to clients through unique data, analytics, workflow technology, advisory and managed services. Clients rely on CoreLogic to help identify and manage growth opportunities, improve performance and mitigate risk. Headquartered in Irvine, Calif., CoreLogic operates in seven countries. For more information, please visit corelogic.com.

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