



Post-Hurricane Recovery: How Long Does it Take?

Implications for disaster recovery after hurricanes Harvey and Irma

In the following report, BuildFax analyzed the geographic areas impacted by three of the costliest storms in recent U.S. history: Katrina, Sandy and Ike.

What you need to know:

- Data on hurricanes Ike, Katrina and Sandy indicate that the average primary recovery period for hurricanes of similar size and magnitude is 14 months, with remodeling peaking three months after a hurricane makes landfall.
 - BuildFax predicts that the primary recovery period for Hurricane Harvey could outpace Katrina, with recovery stretching upwards of 20 months;
 - For Irma—more similar to Superstorm Sandy—the recovery period could take as long as 13 months;
 - A storm's strength does not necessarily indicate when cleanup starts. Ike was a more powerful storm than Sandy, but cleanup following Ike was taken one month following the storm, compared to three months for Sandy and five months for Katrina.

Recovering After a Hurricane: How Long Does It Take?

The 2017 hurricane season has already caused deadly destruction, and recovery can seem a long way off. We've already seen Harvey devastate parts of Texas and Louisiana and now Irma has brought damaging winds and storm surge to Florida, with tropical storm effects rippling all the way up to the Southeast. The burning question now is: how long will it take to put the pieces back together?

Every storm is different with unique movements, from wind strength, to rainfall, and impact area. Depending on the extent of damage caused, it's impossible to know exactly when rebuilding can start and how long it will take. However, examining construction activity from past hurricanes can offer a unique lens through which to observe and anticipate future recovery efforts. In fact, based on estimated costs for Harvey, BuildFax predicts that recovery times for the storm could exceed those seen for Hurricane Katrina. For Irma, the primary recovery period could be comparable to Superstorm Sandy.

For this study, BuildFax analyzed the building activity in the areas impacted by three of the costliest storms in recent U.S. history: Katrina, Sandy, and Ike.

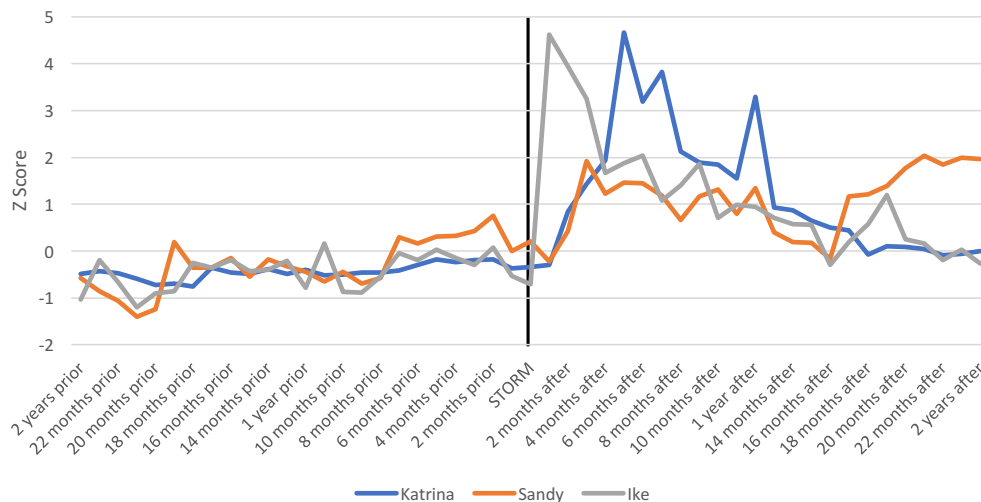
Remodeling After Katrina, Sandy, and Ike

Remodeling activity for each of these three storms peaked at different times, indicating that it takes longer to begin major recovery after certain storms than others. For Ike, recovery remodeling began just one month after landfall. Sandy's remodeling efforts peaked three months after the storm. By comparison, after Katrina, remodeling didn't peak until a full five months later.

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Katrina/Sandy/Ike Remodeling 2 Years Prior - 2 Years After



It stands to reason that smaller category storms would have a shorter clean up period, but that wasn't the case here. Ike was a stronger storm when it made landfall than Sandy, but recovery began months before the other two storms.

Were Ike's effects contained to a smaller area? And is that what made the clean up period after Ike shorter and more manageable? Was Sandy's widespread damage to infrastructure in the Northeast responsible for the slower recovery time? These questions are difficult to answer because so many variables are involved. Overall though, the data on these three storms show that on average, remodeling peaks three months after a storm hits.

While many repairs are made over long periods of time after storms, identifying when the majority of recovery takes place highlights the primary recovery period. Remodeling after Hurricane Katrina leveled out in January 2007 putting the primary recovery period at 18 months after the storm. Superstorm Sandy's remodeling activity appeared to return to normal after around eight months later. After Hurricane Ike, the primary recovery period was around 16 months. Based on these observations, the average primary recovery period for the three storms is 14 months.

Regardless of storm strength, every storm behaves unpredictably and has varying impacts on property. However, the delay to start recovery does appear to coincide with a storm's ultimate recovery costs. As rebuilding efforts for Harvey and Irma loom ahead, this data is meaningful as cost predictions are made for these two back-to-back storms.

With recovery from [Hurricane Harvey estimated to cost up to \\$180 billion](#) and [Hurricane Irma expected to cost about \\$100 billion](#), the primary recovery periods for these two storms could be well above the average for the three costliest storms in recent U.S. history. This could mean the majority of rebuilding after Harvey won't start for at least three months, and it could last for up to 20 months (longer than we saw with Katrina). For Irma, it could take two months to start rebuilding, and the primary recovery period may be comparable to Katrina with an estimated 13-month timeframe.

Key Takeaways:

- On average, based on these three storms, remodeling activity peaks 3 months after a major weather event.
- The primary recovery period lasts for about 14 months on average based on the three storms in this study.

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	COST	CLEAN-UP PERIOD	PRIMARY RECOVERY PERIOD
KATRINA	\$160 BILLION	5 MONTHS	18 MONTHS
SANDY	\$70.2 BILLION	3 MONTHS	8 MONTHS
IKE	\$34.8 BILLION	1 MONTH	16 MONTHS
HARVEY	ESTIMATED \$180 BN	ESTIMATED 3 MONTHS	ESTIMATED 20 MONTHS
IRMA	ESTIMATED \$100 BN	ESTIMATED 2 MONTHS	ESTIMATED 13 MONTHS

Katrina: Costliest Storm Yet & Slowest to Start Recovery

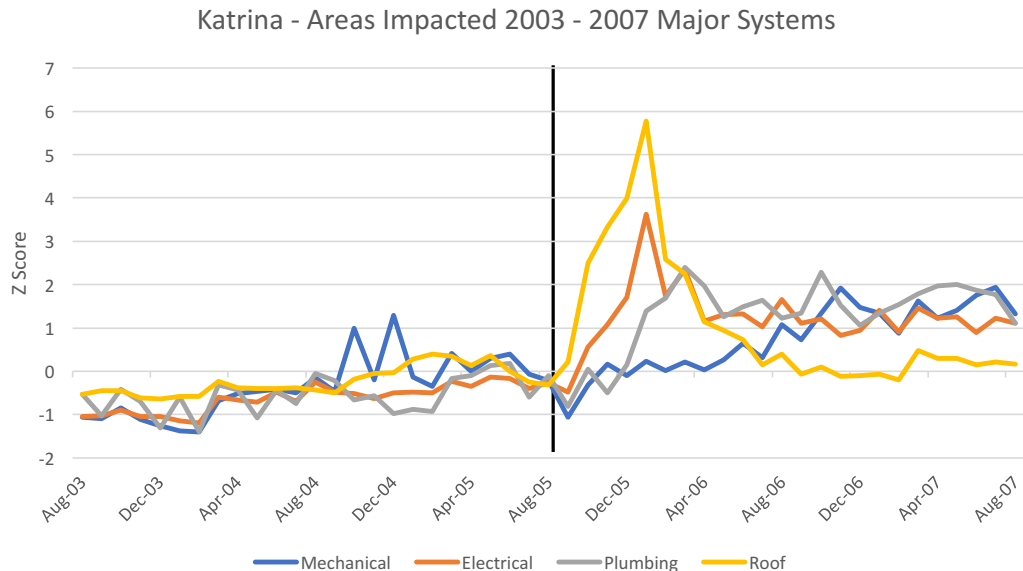
Hurricane Katrina made landfall in August 2005 and caused \$160 billion in property damages as it decimated areas along the Gulf Coast. Especially hard hit were parts of Louisiana (including New Orleans) and coastal Mississippi. Hurricane Katrina was not only costly in terms of property damage, but the cost of human life was also catastrophic: this storm killed nearly 2,000 people.

Katrina left unprecedented death and destruction in its wake, so it makes sense that rebuilding efforts didn't start for several months. By looking at the peaks in remodeling after the storm, it's evident when major recovery began.

In January 2006 - five months after the storm hit - the areas impacted by Katrina saw a peak in roof construction activity of 5.8 standard deviations (SD) along with almost 4 deviations (3.6SD) in electrical updates. Roofing activity remained elevated until late summer that year, when it finally returned to normal levels. Interestingly, electrical updates remained elevated for the next year and a half, as did plumbing and mechanical.



For Irma, it could take two months to start rebuilding.



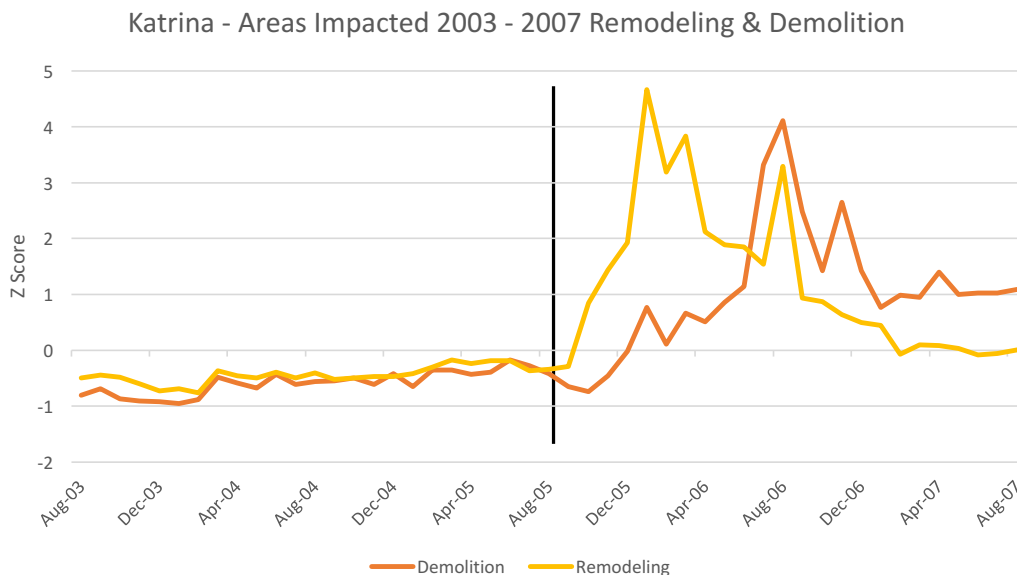
There's also a significant spike in remodeling (4.7SD) in January 2006. Interestingly though, demolition didn't peak until an entire year after landfall in August 2006. Perhaps this is because rebuilding efforts focused first on salvageable buildings while other properties were beyond repair.

Recovery from Katrina was long and drawn out (taking place well into the next decade), and the lead up to that lengthy process is evident in the two years following the storm. Before Katrina, mechanical, electrical, plumbing, and roof activity generally fluctuated between -1SD and 1SD, while they stayed above 0SD post-storm, indicating that a secondary recovery period with elevated remodeling went on for some time, even beyond the plotted timeframe. However, they did level out around April 2006, eight months later.

Remodeling and demolition also remained at an elevated level for the two years following the storm. However, they leveled out in January 2007 after experiencing a surge that lasted right around a year and a half.

Key Takeaways:

- There was a peak in roofing (5.8SD) and electrical activity (3.6SD) five months after Hurricane Katrina.
- There was a spike in remodeling (4.7SD) five months after Hurricane Katrina.
- The peak in remodeling activity indicates that major property recovery began five months after Hurricane Katrina made landfall after the initial clean up effort.
- Remodeling activities leveled out in January 2007, indicating that the primary recovery period took place within an 18-month timeframe.





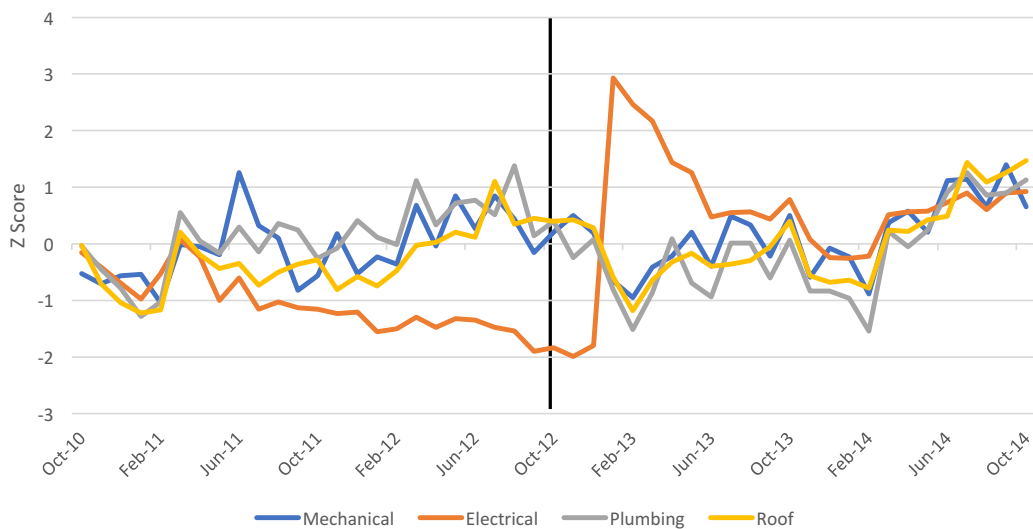
Sandy: Second Costliest & Faster to Start Recovery

Superstorm Sandy made landfall in the U.S. in October 2012. This storm affected 24 states, created \$70.2 billion in damage, and caused 233 fatalities (71 in the U.S.). New Jersey and New York were particularly hard hit, with New York City experiencing flooding from Sandy's storm surge.

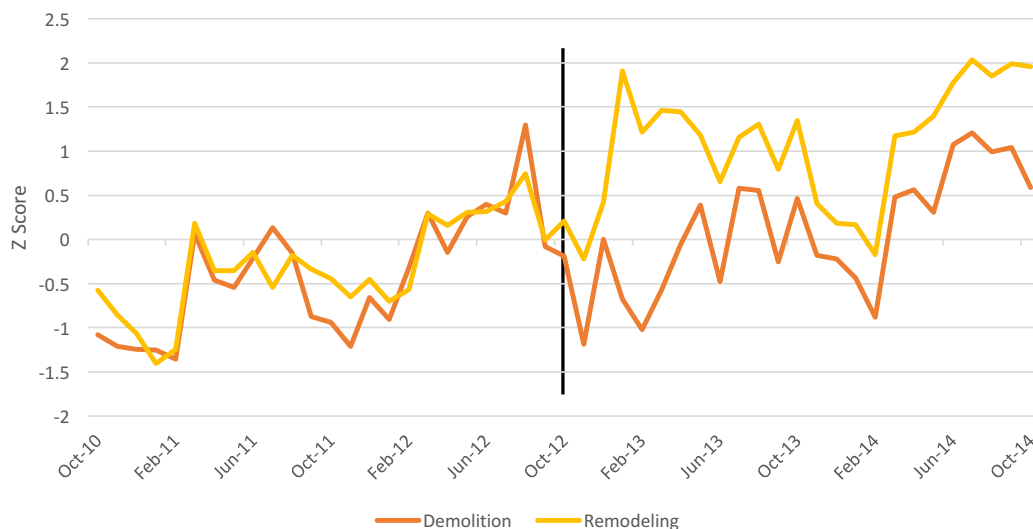
For a storm characterized by widespread flooding, it comes as no surprise that electrical systems took a big hit. Based on the peaks in remodeling activity, major recovery began three months post-storm after the initial clean up period.

After Superstorm Sandy swept through, areas impacted in the U.S. saw a rapid increase in electrical activity (2.9SD), which peaked in January 2013.

Sandy - Areas Impacted 2010 - 2014 Major Systems



Sandy - Areas Impacted 2010 - 2014 Remodeling & Demolition



Remodeling also peaked (1.9SD) three months later in January 2013. Demolition didn't experience a spike, which suggests that teardowns weren't that prevalent here. This is expected since Sandy was a lower category storm.

Mechanical, electrical, plumbing, and roof activity after Sandy all leveled out in June 2013, as did remodeling. Thus, the primary recovery period took place within an eight-month time period.

Key Takeaways:

- There was an uptick in electrical activity (2.9SD) three months after Superstorm Sandy.
- There was an increase in remodeling activity (1.9SD) three months after Superstorm Sandy.
- The primary recovery period for Superstorm Sandy took place within an eight-month time period.



After Superstorm Sandy swept through, the areas impacted in the U.S. saw a rapid increase in electrical activity, peaking in January 2013.

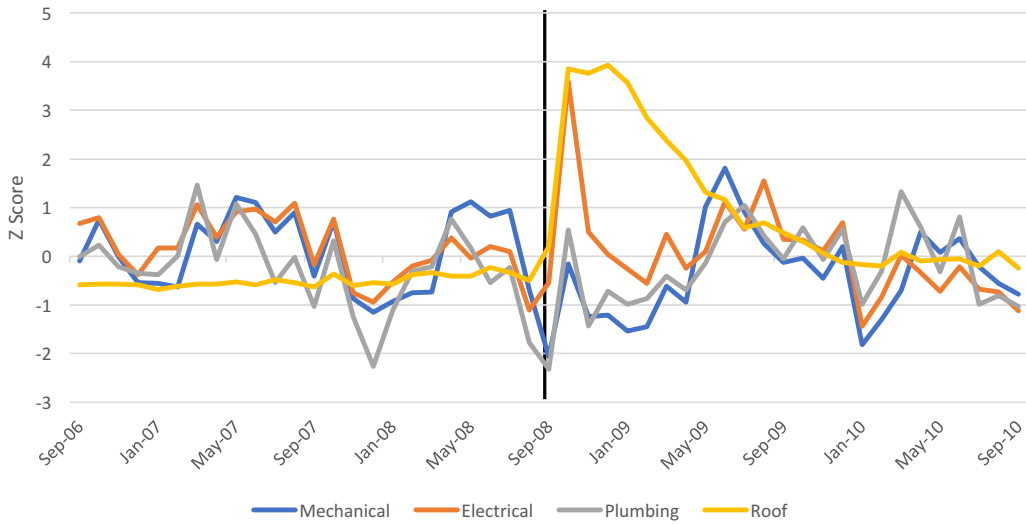
Ike: Third Costliest & Fastest to Start Recovery

Hurricane Ike hit the U.S. in September 2008, bringing damaging winds and flooding from Texas to Louisiana, Mississippi, and the Florida panhandle, even including parts of the Midwest. The storm caused \$34.8 billion in damages and there were 195 deaths (113 in the U.S.).

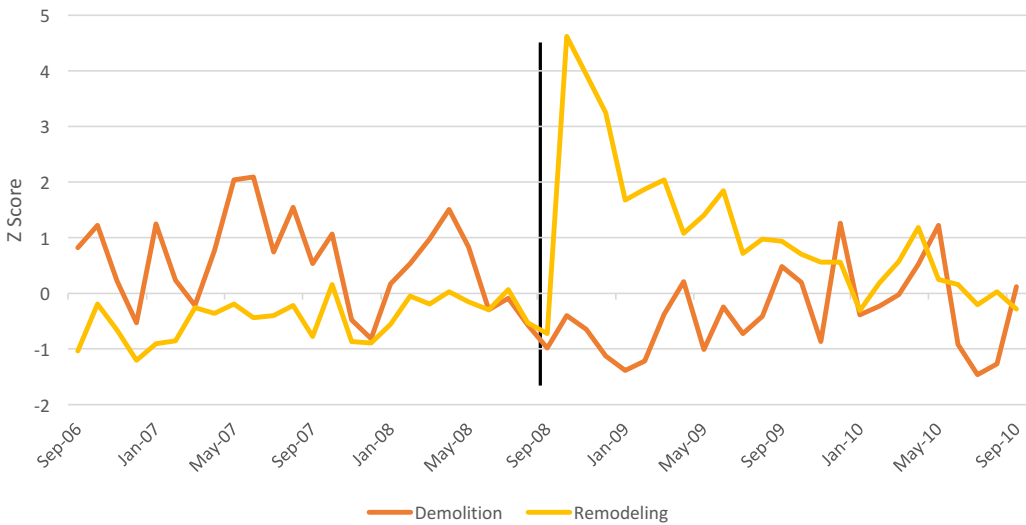
Ike's major recovery efforts began almost immediately following the storm, just one month later.

Areas impacted by the storm saw an increase in roof construction activity (4.2SD) and electrical activity (3.6SD) only one month after landfall. They returned to their pre-storm levels around June 2009, nine months after the storm.

Ike - Areas Impacted 2006 - 2010 Major Systems



Ike - Areas Impacted 2006 - 2010 Remodeling & Demolition





As with Sandy, there was no evident spike in demolition after this storm. However, there was a huge leap in remodeling (4.6SD) at the one-month mark. The rate of remodeling returned to pre-storm levels in January 2010, which indicates that the primary recovery period took place during a 16-month timeframe.

So what will the timeframe look like for clean up and recovery after 2017's hurricane season? There is no easy answer, but historical construction activity data is a powerful resource to help improve modeling and inform future catastrophic recovery efforts.

Key Takeaways:

- The data shows an uptick in roof (4.2SD) and electrical updates (3.6SD) one month after Hurricane Ike.
- There's a significant increase in remodeling (4.6SD) one month after Hurricane Ike.
- Remodeling activity returned to pre-storm levels in January 2010, indicating the primary recovery period took place during a 16-month timeframe.

About BuildFax:

BuildFax, headquartered in Austin, Texas, is trusted by the largest insurance and financial institutions in the world to deliver business-critical property condition and history data. With the only database of its kind encompassing more than 23 billion data points on commercial and residential structures, BuildFax delivers detailed data on everything from remodeling, solar installations, new construction, roof age, maintenance history, and more. To learn more about BuildFax, visit www.buildfax.com.

Method:

The plots surrounding each storm were derived by taking data from a nine year period: four years before the storm and four years after, plus the year of the storm itself. Z scores were then computed on each of those nine-year samples to visualize shocks to permit activity within that period. The y-axis numbers are thus interpreted as the standard deviation from the mean level of activity over each time period.

Assuming the rate of reinvestment per square mile of damage is a good measure of the length of recovery, we determined the clean-up and primary recovery period based on estimated affected areas for Harvey and Irma.

Storm costs for Katrina, Sandy, and Ike are adjusted for inflation with consumer price index adjustment to 2017 levels and sourced from NOAA.

For more information
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