

Regional Commentary — September 17, 2021

Assessing the Damages from Hurricane Ida

Summary

On August 29, Hurricane Ida made landfall in southeast Louisiana as a Category 4 hurricane, exactly 16 years to the day that Hurricane Katrina devastated New Orleans.

- Louisiana appears to have been hit the hardest by the storm. While power has been restored for many, repairs to the power grid are expected to take weeks. New Orleans' tourism industry, one of the metro's key economic drivers, will likely be sidelined for an extended period.
- Negative economic effects extend to the broader U.S. economy as well. Freight movement from the Port of New Orleans came to a standstill, and millions of barrels of crude oil production were interrupted, as was natural gas output.
- Torrential downpours took many areas by surprise as the storm moved north. That said, the lessons learned from Hurricane Sandy in 2012 likely prevented even greater damages. Many buildings in the Northeast have been retrofitted to better withstand the impacts of extreme weather.
- Severe weather events are becoming less rare and the overall losses incurred by these catastrophes are on the rise. Hurricane Ida serves as a reminder that even inland areas may need to devise their own natural disaster mitigation strategies.

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Hurricane Ida Devastates the East Coast

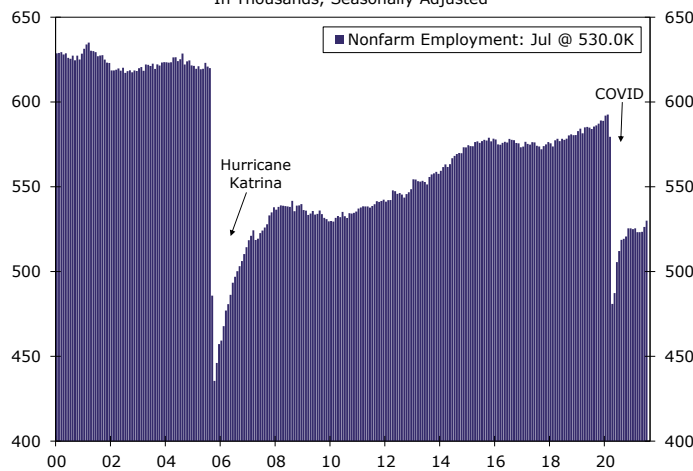
On August 29, Hurricane Ida arrived in southeast Louisiana as a Category 4 hurricane with over 150 mile-per-hour winds registered in some locations. Ida, which was the fifth most powerful hurricane to hit the United States, dumped 10-15 inches of rain near its landfall location and brought a storm surge of 5-12 feet. After making landfall, the intensity of the storm lessened, and Ida was downgraded to a tropical storm as it coursed up through the Eastern Heartland and into the Northeast. While wind speeds died down, the rain did not, bringing flooding, agricultural ruin, infrastructure damage and general destruction for areas in the storm's path.

Louisiana appears to have been hit the hardest by Ida. The storm prompted evacuations of thousands of residents and the intense winds knocked out power for over one million households in Louisiana and Mississippi. While power has been restored for many households and businesses throughout New Orleans, repairs are expected to take weeks. The tourism industry, which is still battling pandemic-related challenges and is one of the metro's key economic drivers, will likely be sidelined for an extended period. Many hotels, bars and restaurants remain shuttered, and live events that were scheduled to take place in the city have been canceled, postponed or relocated. Notably, the New Orleans Saints were forced to play their home opener in Jacksonville, Florida. According to Smith Travel Research (STR), over 150 New Orleans hotels are still temporarily closed due to power outages, staffing issues and vendors being offline.

The Louisiana economy is still on the mend from the pandemic-induced downturn, and the hurricane damages will only serve to prolong the region's recovery. After Hurricane Katrina hit Louisiana in 2005, the unemployment rate spiked from 5.6% in August to 11.4% in September. It wasn't until January 2006 that the jobless rate returned to the levels seen before the storm. New Orleans' labor market was particularly affected. The metro area lost more than 184,000 jobs in the two months following Katrina, a 30% decline. Industry payrolls partially bounced back in the months after, but the metro's employment base never returned to pre-Katrina levels. At the start of 2020, before the pandemic hit, payrolls in New Orleans were still about 4.5%, or 28,000 jobs, short of the level seen before Katrina. COVID has brought an entirely new set of challenges for the region. New Orleans lost over 111,000 jobs during the lockdown phase of the pandemic in the spring of 2020. As of July 2020, the Big Easy's economy has only recouped about 49,000 of those jobs. Even though the damages appear to be relatively smaller than those inflicted by Katrina, the one-two punch of the pandemic and Hurricane Ida will likely weigh heavily on the region's economic recovery.

New Orleans Nonfarm Employment

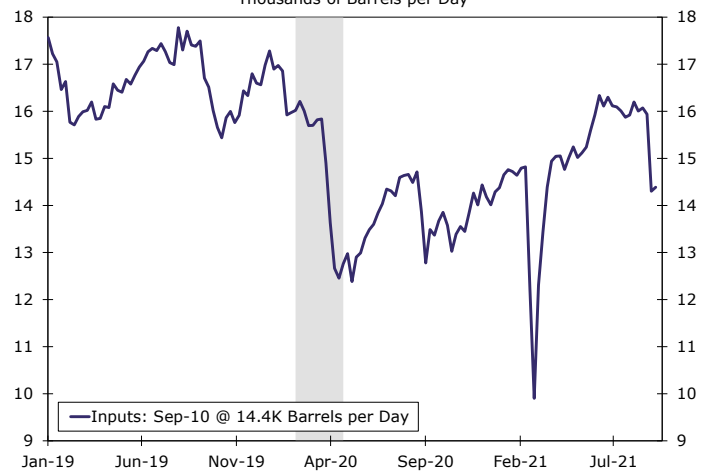
In Thousands, Seasonally Adjusted



Source: U.S. Department of Labor and Wells Fargo Securities

U.S. Crude Oil Inputs into Refineries

Thousands of Barrels per Day



Source: U.S. Energy Information Administration and Wells Fargo Securities

The potential negative economic effects extend to the broader U.S. economy as well. For one, the Port of New Orleans (Port NOLA) is a key access point for the Mississippi River. Freight movement came to a standstill as the port closed down during the storm. Port NOLA has since reopened, but the disruption could add to the pressures generated by ongoing supply-chain bottlenecks across the country. Furthermore, the storm temporarily shut-in almost all Gulf Coast oil production. Louisiana's

onshore refineries appear to be back up and running after temporarily shutting down, but Hurricane Ida badly damaged Port Fourchon, which supports an estimated 16% of U.S. crude oil production and 4% of U.S. natural gas production. The total crude supply loss is estimated to be between 30 million and 40 million barrels, making Ida the most damaging hurricane to hit the Gulf oil industry since 2005, when Katrina and Rita both hit the area.

Torrential downpours took many areas by surprise as the storm moved north. The Bonnaroo Music & Arts Festival in Tennessee was canceled just days before the four-day event was scheduled to begin, as Ida produced intense rainfall and flooded campgrounds. Some major metro areas in the Northeast are currently still dealing with the aftermath of Ida. The storm brought intense rainfall to New York, New Jersey and surrounding states. The record rainfall overwhelmed water drainage systems, disrupted transit and caused damage to infrastructure. Much of the flooding damages have occurred in urban areas where storm water is less easily absorbed, such as in the greater New York City area and Philadelphia. In southeastern Pennsylvania, a water treatment facility was knocked offline, and customers in the area are still being asked to conserve water.

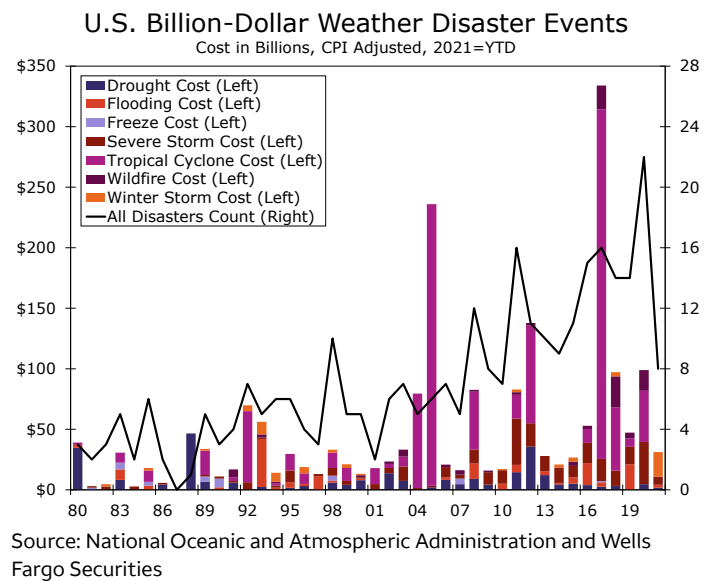
On top of the human toll the hurricane has wrought (currently, the death toll stands at 82 people), the economic damages continue to pile up. CoreLogic, an analytics firm that provides catastrophe risk modeling, estimates insured and uninsured losses from wind, storm surge and inland flooding are between \$27 billion and \$40 billion in Louisiana and Mississippi. In the Northeast, the insured and uninsured inland flood losses to residential and commercial properties amount from \$16 billion to \$24 billion, mostly in Pennsylvania, New Jersey, New York, Connecticut and Massachusetts. Putting this all together, the total losses are estimated to be between \$43 billion and \$64 billion, which would make Ida the fifth-costliest Atlantic hurricane on record.

For context, Hurricane Katrina tops the list, with an estimated \$125 billion in total losses in 2005. Damages for Hurricane Harvey, which slammed East Texas and Louisiana in 2017, also amounted to \$125 billion. At present, Ida's damages appear to be more in line with those sustained in the wake of Hurricane Sandy in 2012. Sandy pummeled New Jersey and New York, but its impacts were felt across the entire eastern seaboard from Florida to Maine and into Michigan and Wisconsin in the Midwest. Of course, the actual losses incurred by Hurricane Ida could be higher once all of the damages to residential, commercial and industrial properties are accounted for. The long-term impacts of flooding, which include everything from mold growth to impairment of critical infrastructure, are difficult to assess quickly. These estimates do not include the overall economic impact to the local economies that have essentially been shut down by power outages and flooding.

Costliest Atlantic Hurricanes			
	<i>Nominal damage (Billions USD)</i>	<i>Year</i>	<i>Storm classification at peak intensity</i>
Katrina	\$125	2005	Category 5
Harvey	\$125	2017	Category 4
Maria	\$90	2017	Category 5
Sandy	\$65	2012	Category 3
Ida	\$43-\$64	2021	Category 4
Irma	\$50	2017	Category 5
Ike	\$30	2008	Category 4
Andrew	\$27	1992	Category 5
Michael	\$25	2018	Category 5
Florence	\$24	2018	Category 4

Source: National Hurricane Center and Wells Fargo Securities

One silver lining of Hurricane Ida is that it drives home the importance of hardening hurricane and flood prone areas. Hurricane Ida made landfall exactly 16 years to the day that Hurricane Katrina devastated New Orleans. Hurricane Ida's damages do not appear to be of the same magnitude of Hurricane Katrina's, in part, because of a \$15 billion investment in fortifying the region's flood



walls, levees, canals and barriers. The flooding that occurred during Katrina was largely the result of engineering flaws in the region's flood protection system. After the levees broke, approximately 80% of New Orleans and the surrounding neighborhoods and parishes were flooded. The storm also temporarily left tens of thousands without food or water, caused more than 1,800 deaths and permanently displaced an estimated 1.5 million people from Louisiana, Mississippi and Alabama.

What's more, the lessons learned from Hurricane Sandy in 2012 likely prevented even greater economic damages in the Northeast. Beyond the rebuilding efforts following Sandy, many buildings were retrofitted to better withstand the impacts of hurricanes. Some residential properties on the coast have been lifted to prevent flooding, while utility rooms in commercial buildings have been moved to higher levels. The population density of the Northeast means a high prevalence of multifamily housing, but efforts have been made to convert below-ground units to storage areas. Hurricane Sandy also spurred the Metropolitan Transit Authority (MTA) in New York City to invest \$40 million in a subway flood prevention system, although that system was designed to mitigate flooding from more-predictable storm surges as opposed to Ida's flash-flooding. Furthermore, the storm prompted many businesses and homeowners in the Northeast to purchase flood insurance, which before Sandy was uncommon, as hurricanes rarely made their way so far up north. Simply put, were it not for these hazard mitigation systems deployed in the aftermath of Katrina and Sandy, the destruction caused by Ida arguably would have been much worse.

Hurricane Ida serves as a reminder that even inland areas may need to devise their own natural disaster mitigation strategies. Severe weather events are becoming less rare and the overall losses incurred by these catastrophes is on the rise, as more development is occurring in areas prone to extreme weather. In addition to Hurricane Ida, an arctic blast wreaked havoc on Texas' energy grid earlier this year, while drought and wildfires have placed a tremendous strain on the Western region's agriculture sector and water supplies for most of the year. Moreover, there are still two and a half months left in the 2021 hurricane season. On the heels of Ida, Hurricane Nicholas recently pummeled Texas and Louisiana.

The large number of powerful storms is having an impact on the broader economy, both directly and indirectly. Texas and Florida have become a much larger part of the national economy. Texas is the nation's second-most populous state, with 29.1 million residents, four million of which were added in the past decade. The state's petrochemical industry not only fuels the nation's economy but also provides the inputs for thousands of products used throughout the world. Outages at refineries and petrochemical plants quickly reverberate throughout the country, worsening supply issues for everything from plastic bottles to windows and computers. Florida is the nation's third-largest state, with 21.5 million residents, 2.7 million of which were added in just the past decade. Florida has the most experience in dealing with powerful storms, however, and has strict building codes, which have helped mitigate damages from what would otherwise have been even more damaging storms.

A growing number of natural disasters outside of Florida have also affected densely populated areas. While many of these areas have long been susceptible to hurricanes, many areas have only been brushed by major storms in prior decades, which left them ill prepared for the soaking rains that accompanied Ida. Floods are particularly menacing for densely populated urban areas such as Houston, New Orleans and the Northeast Corridor, where fewer mitigation plans are in place and there are more buildings and infrastructure to be damaged. The rising number of severe weather events across the country likely serves as a wake-up call for local governments, economic development authorities and property owners. There are cost-effective strategies that developers, policymakers and property owners could put in place to greatly reduce the impacts of weather disasters. According to the Institute of Building Sciences, mitigation saves up to \$13 per \$1 invested. Adopting more stringent building codes, upgrading existing structures and improving utilities and transportation systems are areas that can be strengthened ahead of future storms, making areas more resilient.

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