Harvey: An Exceptional Event

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NWS River Forecast Center Analysis, 7 AM August 25, 2017



NWS River Forecast Center Analysis, 7 AM August 26, 2017



NWS River Forecast Center Analysis, 7 AM August 27, 2017



NWS River Forecast Center Analysis, 7 AM August 28, 2017



NWS River Forecast Center Analysis, 7 AM August 29, 2017



NWS River Forecast Center Analysis, 7 AM August 30, 2017



NWS River Forecast Center Analysis, 7 AM August 31, 2017







Total Rainfall from Harvey



Area of Harvey's Rain in Perspective



Greatest US Storms: 5 days, 10,000 sq mi



Historic analyses: Applied Weather Associates; US Army Corps of Engineers John Nielsen-Gammon, Texas A&M University

Gr^{33.28} US Storms: 5 days, 10,000 sq mi



Historic analyses: Applied Weather Associates; US Army Corps of Engineers John Nielsen-Gammon, Texas A&M University

(Central/Eastern) US Depth-Area-Duration All-Time Records

Area\Duration	2 Days	3 Days	4 Days	5 Days
1,000 sq mi	Louisiana, August 1940	Harvey	Harvey	Harvey
2,000 sq mi	Harvey	Harvey	Harvey	Harvey
5,000 sq mi	Harvey	Harvey	Harvey	Harvey
10,000 sq mi	Harvey	Harvey	Harvey	Harvey
20,000 sq mi	Harvey	Harvey	Harvey	Harvey
50,000 sq mi	Harvey	Harvey	Harvey	Harvey

Greatest US Storms: 5 days, 1,777 sq mi



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Comparison Between Harvey and Probable Maximum Precipitation



Gr^{33.28} US Storms: 5 days, 10,000 sq mi



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Gr 33.28" LUS Storms: 5 days, 10,000 sq mi

Climate change rainfall contribution?



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Take-Home Messages

- Harvey's rainfall was exceptional
- There was disastrous flooding in Houston, Beaumont, etc. because Harvey's rainfall was exceptional
- In an important sense, Harvey may have produced more rain than was thought to be possible
- Global warming brings new possibilities