



A Different Perspective on the 2016 Louisiana Flood

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Introduction

- Baton Rouge, LA receives most of its annual rainfall during the spring and summer months.
- Its proximity to the Gulf of Mexico promotes deep moist convection leading to very intense rainfall.
- Prolonged precipitation events can cause widespread flooding like the 2016 Louisiana Flood.
- This study focuses on analyzing daily precipitation over the past 43 years (1973-2016) to identify storms similar to the 2016 Louisiana Flood.

The Storm

- A quasi-stationary low pressure system formed over Louisiana on 10 August 2016 and slowly moved westward toward Texas-Louisiana border over subsequent days
- A Mesoscale Convective System formed in southwest quadrant of the low on 12 August and slowly moved westward until dissipating on 14 August
- Baton Rouge received it's daily rainfall record of 11.74 in (298 mm) on 13 August
- 13 people killed, 30,000 people rescued, 40,000 homes damaged, and 20 Parishes were declared Major Federal Disaster Areas

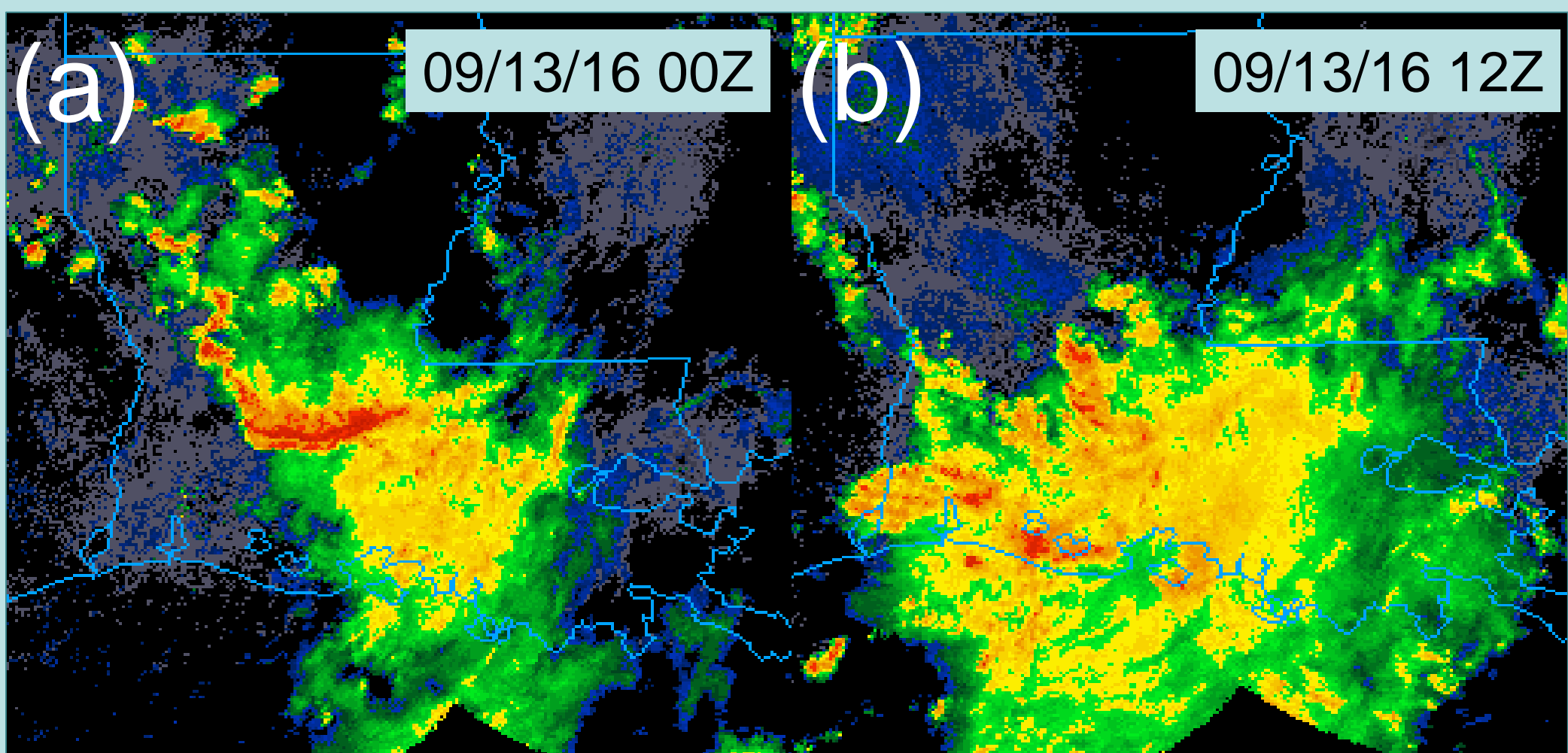


Figure 1. Archived radar images from 13 August 2016. (a) depicts an area of heavy rain developing over Central Louisiana, whereas (b) depicts heavy rain 12 hours later. Image illustrates quasi-stationary movement of MCS and intense rainfall.

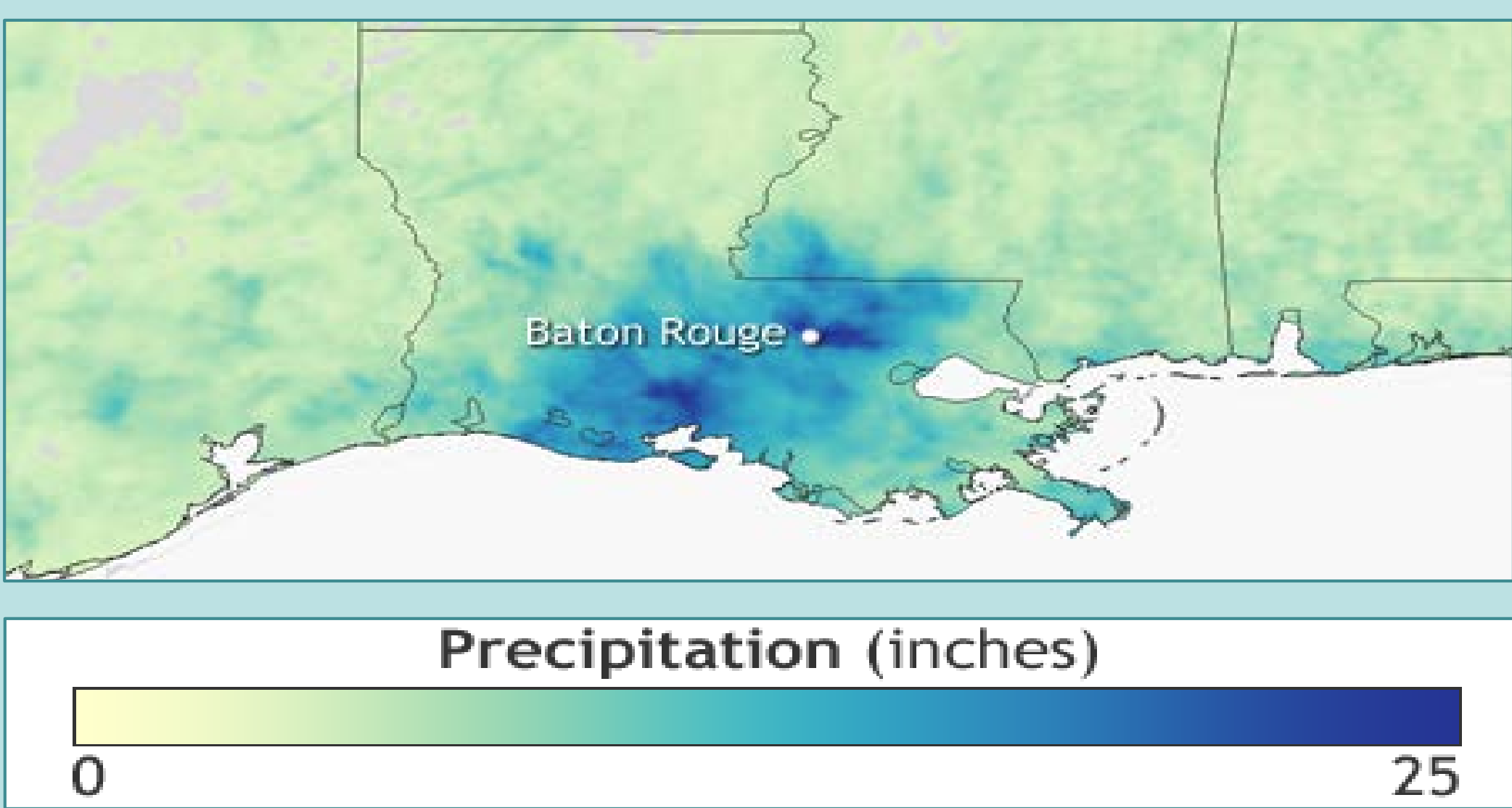
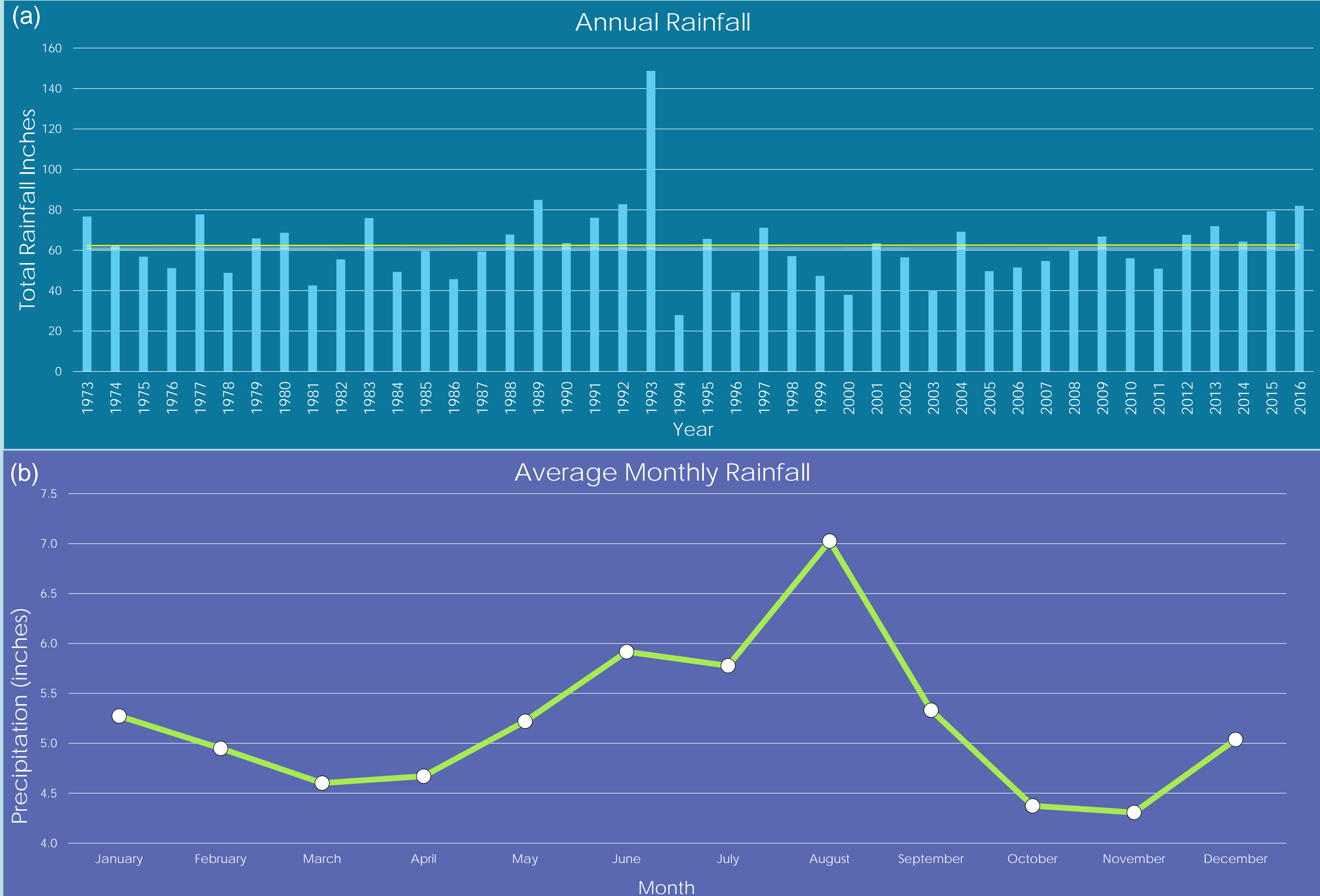


Figure 2. Total precipitation (inches) for 10–15 August 2016. Image is obtained from Climate.gov

Average Rainfall In Baton Rouge, LA



Maximum 72-Hour Rainfall Events

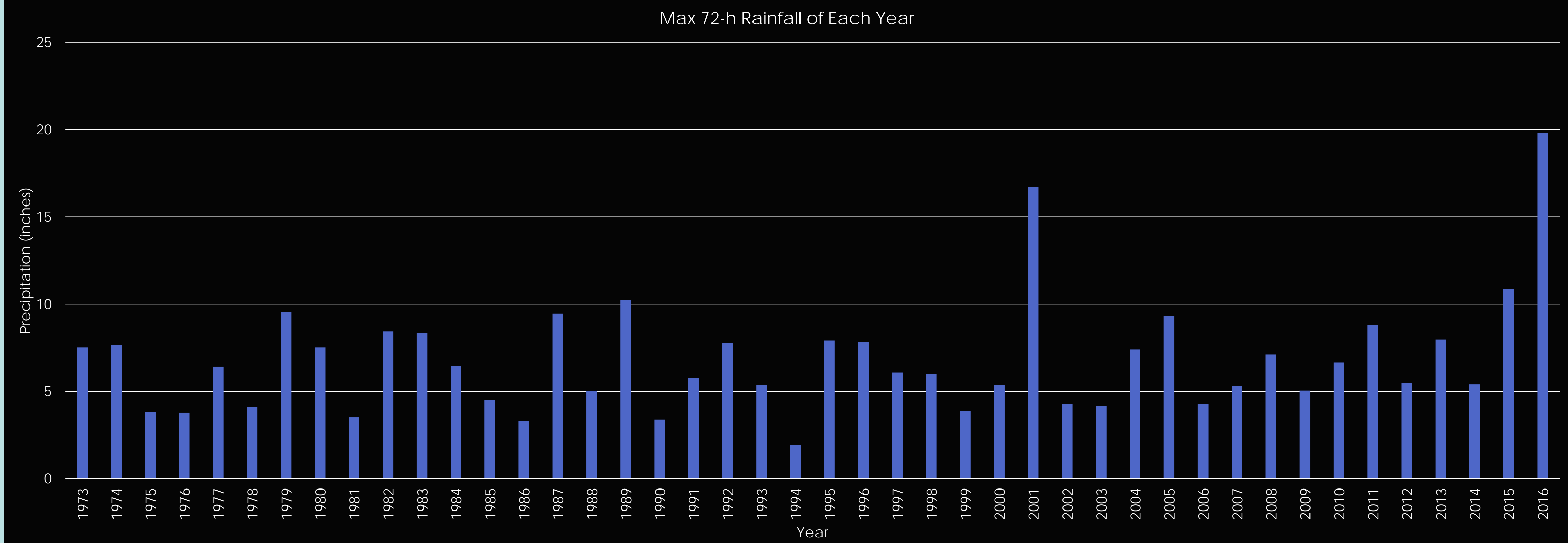


Figure 4 Maximum 72 Hr Rainfall Events from 1973-2016 in Baton Rouge, LA

Discussion Points

- Analyzed 72-h rainfall events instead of 24-h events in order to differentiate between localized and widespread flooding events (Fig.4)
- All of the >10" 72-h events during 1973-2016 were associated with tropical systems (Fig. 4).
- The 2016 Louisiana Flood was responsible for 282% of the average monthly rainfall for the month of August.
- Further analysis showed that flooding of this magnitude is more likely in the fall and spring months, due to interactions between tropical moisture and mid-latitude flow.

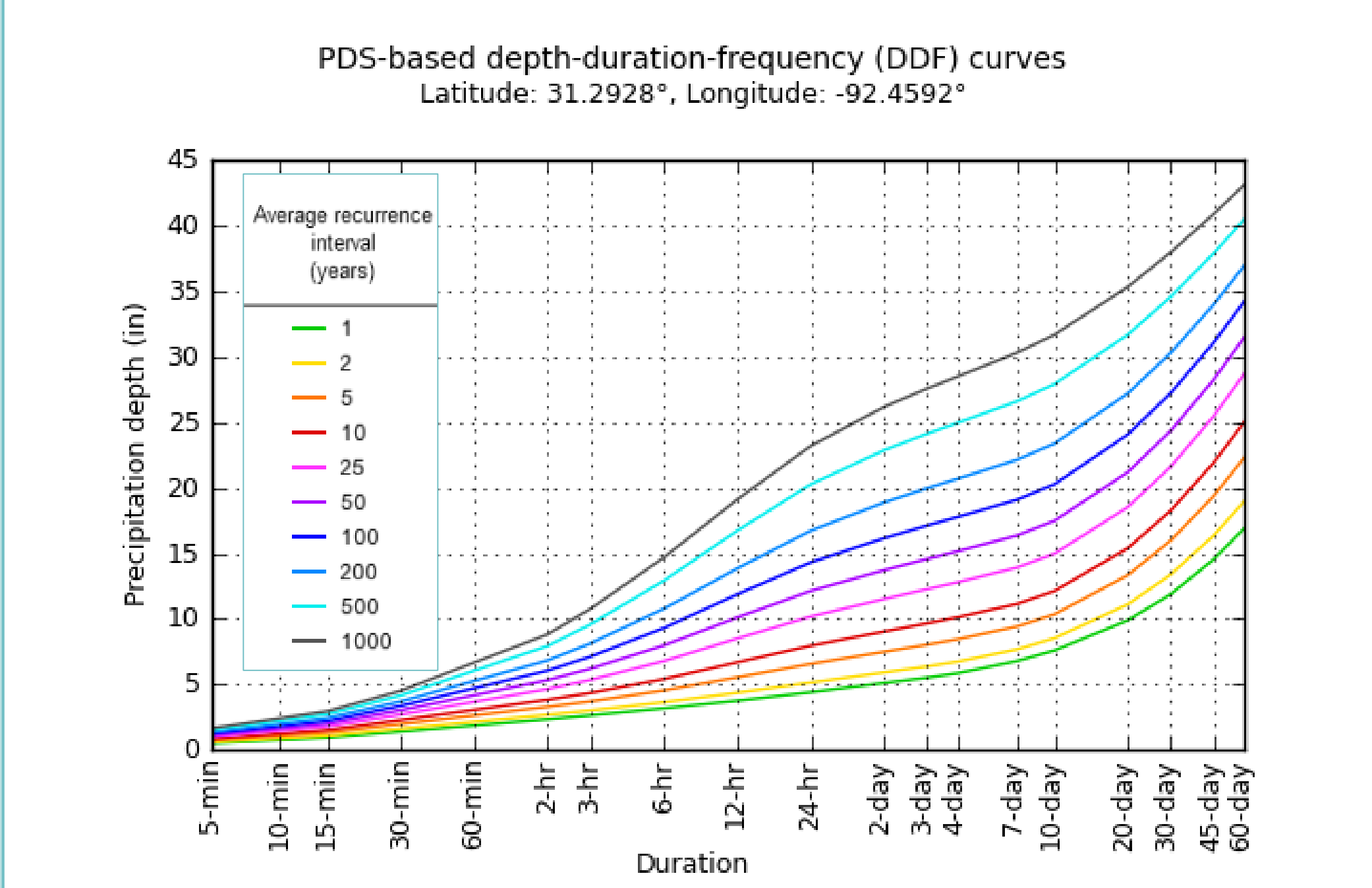


Figure 5. Average recurrence intervals for various threshold precipitation amount. Image from hdsc.nws.noaa.gov

Conclusions

- Extreme precipitation and flooding of this magnitude is comparable to other events related to tropical cyclones
- The August 2016 rainfall and flood is considered a **1-in-500-to-1000-year** event (i.e., a 0.1 to 0.2% chance of happening in any given year)
- Annual precipitation is not always an indicator of flooding events; for example 1993 had an extraordinary amount of rain, but the rain fell on a manageable and consistent basis
- Tropical systems are the primary cause of extreme 72-h precipitation in this region

Acknowledgments

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