



# A Five-Year Radar-Based Climatology of Texas Coastal "Streamer" Showers



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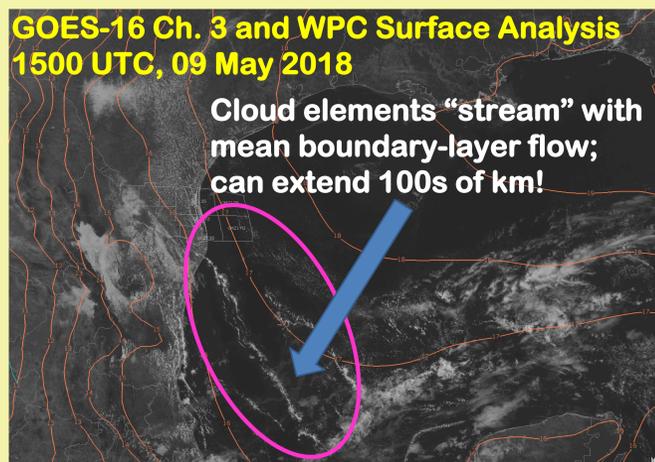
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## Just What is a "Streamer Shower"?



"Streamer showers" were mentioned in NWS Area Forecast Discussions (AFD's) more than 900\* times during 2017, despite the fact that no definition appears in the literature (e. g., *AMS Glossary of Meteorology*). 725 of these occurrences were in AFD's by Texas coastal offices.

\* Not necessarily unique occurrences; there were duplications when AFD's were issued with previous text included.



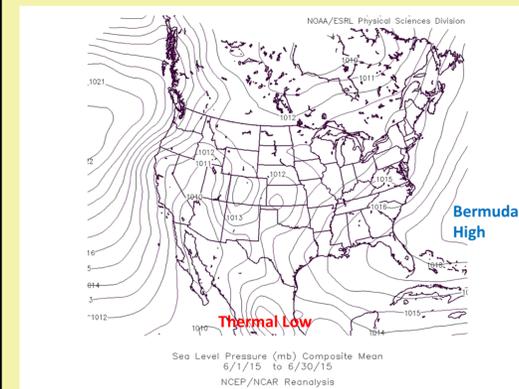
## Methodology

A visual examination of daily KBRO WSR-88D (0.5° scan) reflectivity imagery was performed for 2014-2016 (2017-2018 in progress), and elements of a morphological definition for streamer showers were developed:

1. Radar reflectivity: At least some portion of the echo  $\geq$  20dBZ.
2. Aspect ratio of radar echo at least 6:1.
3. Persistence time of at least 30 minutes.
4. Movement of shower elements generally with mean boundary-layer (BL) flow.

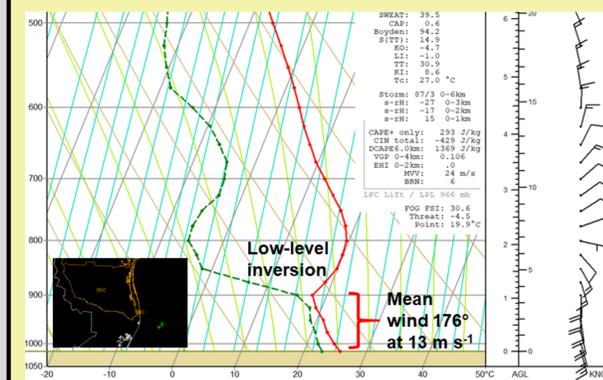
Starting/ending times and duration were tallied for each streamer occurrence.

## Conceptual Model



MSLP Composite for Jun 2015 (19 streamer days); image provided by the NOAA-ESRL Physical Sciences Division

Forecasters sometimes attribute lifting mechanism to warm-air advection in AFD's, but that seems unlikely along Lower Texas coast.

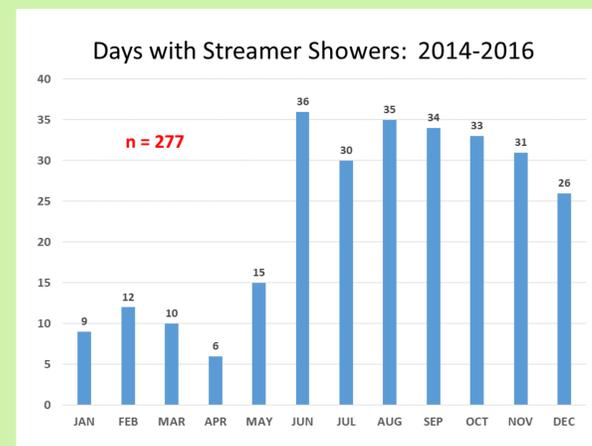


RAP Analysis Sounding: 1300 UTC, 07 Nov 2017

Sheared BL roll convection seems more likely as forcing mechanism.

Steep low-level lapse rates and elevated wind speeds consistent with heat/moisture flux from ocean surface.

## Results

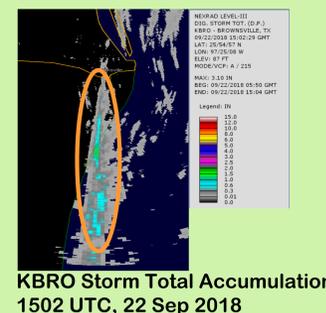


Month	Percent of Days
JAN	10%
FEB	14%
MAR	11%
APR	7%
MAY	16%
JUN	40%
JUL	32%
AUG	38%
SEP	38%
OCT	35%
NOV	34%
DEC	28%
2014-2016	25%

Mean Start Time: 0950 UTC      Mean Duration: 2h 56m  
 Median Start Time: 0930 UTC      Median Duration: 2h 00m  
 Start Time Std. Dev.: 5h 13m      Duration Std. Dev.: 2h 37m

Streamers were found to occur during 3.5% of all hours in the three-year sample.

Streamers can become "enhanced" at times, producing over 1" of rainfall.



## Conclusions

- A working definition of *streamer showers* has been used to perform a basic climatology of these features.
- Streamer showers are most common along the Lower Texas coast between the months of June through December (28-40% of days), with a pronounced minimum between January and May.
- Streamers are mainly a nocturnal phenomenon, typically initiating between 0900-1000 UTC.
- Streamers tend to last for 2 to 3 hours (though with a fairly wide variance).