

# iCYCLONE CHASE REPORT

storm	Hurricane HARVEY		
location	Rockport, Texas, USA		
date	25-26 August 2017		
chasers	Josh Morgerman	author	Josh Morgerman

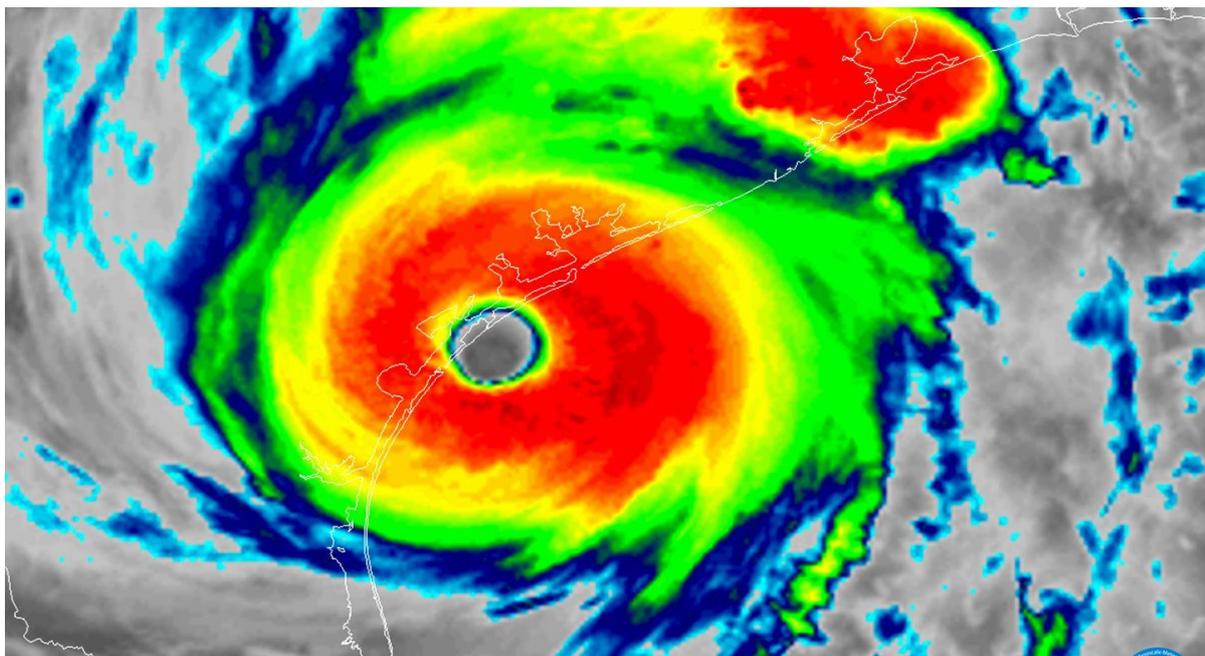
## Overview

**Hurricane HARVEY** was an intense, Category-4 hurricane that struck the central Texas coast on 25-26 August 2017.

The author was in **Rockport, Texas** (28.05795N 97.04096W)—very close to the landfall point—to document this event.

Key observations:

- **Duration.** The hurricane's core—accompanied by very destructive winds—lasted about 5 hours: from ~8:15 pm to ~1:30 am.
- **Eye Passage.** The eye brought a lull lasting well over 2 hours—from ~10 pm to ~12:20 am.
- **Minimum Pressure.** The lowest pressure was 940.8 mb at 10:31 pm CDT, during the eye.
- **Symmetry.** This was a well-developed, relatively symmetric cyclone, with violent winds and very heavy rainfall both preceding and following the eye.
- **Inner-core Air-pressure Fluctuations.** There were wild pressure fluctuations inside the cyclone's inner core—especially during the transition from the inner eyewall to the eye. One of these fluctuations brought a ~10-mb plunge in 4 minutes. These fluctuations seemed to be accompanied by equally volatile variations in the wind speeds and may have been caused by inner-core mesovortices.
- **Damage.** Wind damage in the direct-hit zone was extensive to heavy.



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## Location

The author observed the passage of **Hurricane HARVEY** in **Rockport, Texas**, at **28.05795N 97.04096W**. This location is at the Fairfield Inn & Suites by Marriott on Highway 35—on the N side of town, close to the border with Fulton, about 0.37 n mi from Aransas Bay.

As per NHC advisory positions, this location was very close to the cyclone's landfall point, and only ~2 n mi W of HARVEY's center (at its point of closest approach).

The author arrived at this location a few hours before the arrival of the cyclone's core, and remained there until the storm had passed.

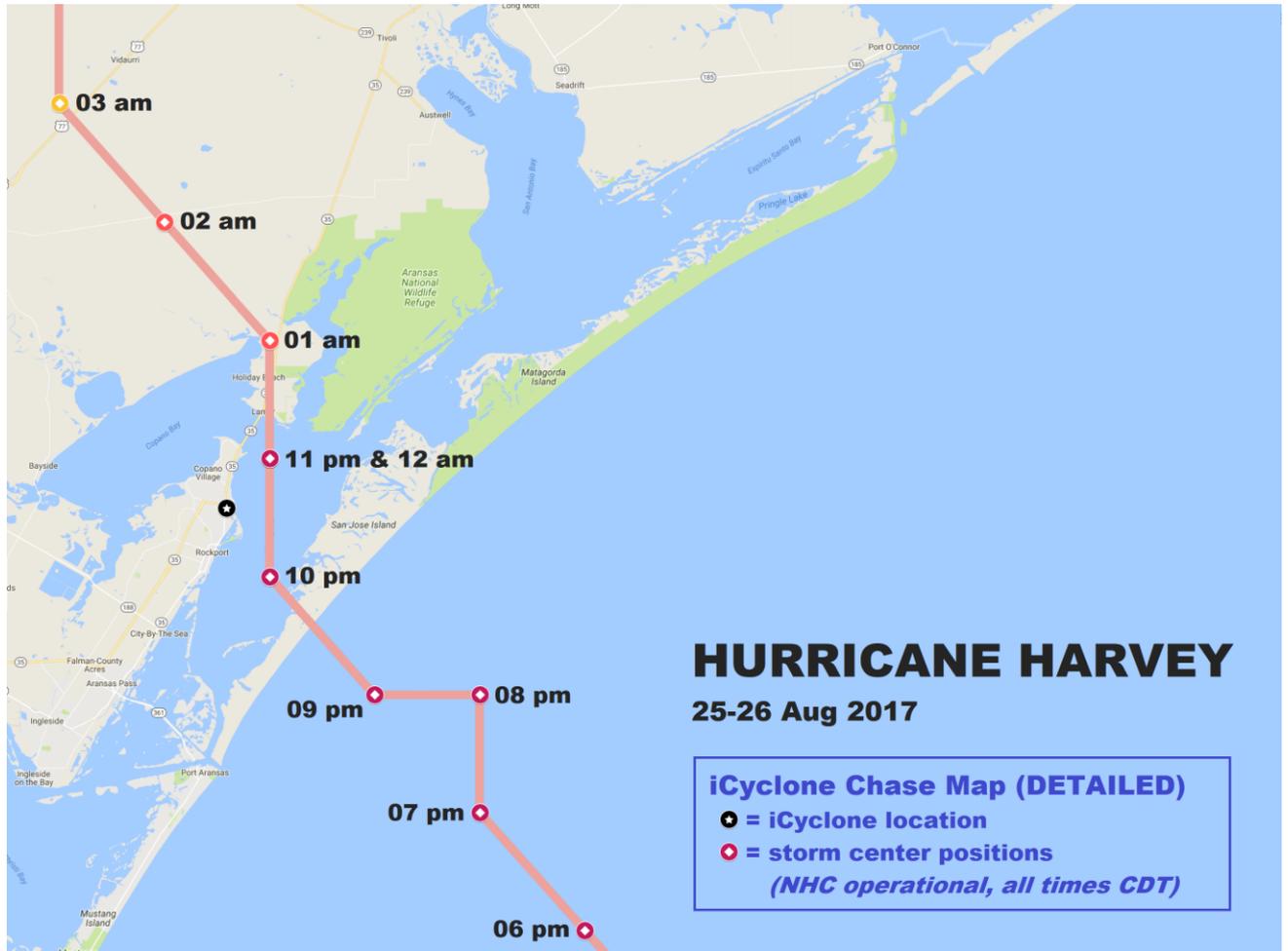
The **Chase Map** shows **the author's location (black star)** in relation to **HARVEY's center (colored points)**, as per NHC advisory positions. (**Chase Map (DETAILED)** is a closer view.)

**Figure 1: Chase Map**



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Figure 2: Chase Map (DETAILED)



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## Chronology

HARVEY made landfall on San Jose Island, very near Rockport. The slow-moving hurricane's eye passed directly over the town, resulting in a lull that lasted well over 2 hours.

Following is a detailed chronology of observed conditions in Rockport during the hurricane's passage—reconstructed from the author's **time-stamped video footage, social-media postings (Tweets) made in real time, and air-pressure data.**

Color key:

- **Pink = violent winds**—defined here as winds that inflict structural damage.
- **Blue = relative calm of the eye.**
- **Yellow highlight = minimum air pressure.**

Please note that the start and end times of these phases were subjectively determined (without wind data) and should be considered **approximate**. Also note that some air-pressure values indicated in real-time Tweets during the event have since been corrected to match data recorded by the instrument that stayed in a controlled environment during the storm.

All times are **local (CDT)**:

### /1 – Front Side

<u>TIME (CDT)</u>	<u>MB</u>	<u>CONDITIONS</u>
2:00 pm	--	heavy rainband sweeping through
4:00 pm	994.6	stormy
4:30 pm	992.5	getting <b>*extremely*</b> windy; light rain; constant whistling sound
4:45 pm	991.8	intense rainband with strong winds, extremely heavy rain
6:30 pm	986.0	turbulent & stormy; lights flickering
6:45 pm	985.0	apparently in moat, outside eyewall: light rain with <b>*very*</b> strong winds, gusts over hurricane force
7:25 pm	980.2	wind getting dangerously strong
7:35 pm	978.9	gusts coming in great bursts, some violent; ears popping; power out
8:15 pm	971.1	<b>violent gusts; flying debris; upper floors of hotel swaying</b>
8:40 pm	965.6	<b>powerful winds: light poles dancing; cars bouncing in parking lot</b>
8:50 pm	963.1	<b>extreme winds pounding building: wall separating from stairwell, ceiling tiles falling, draft inside building; guests herded into lobby</b>
9:23 pm	951.2	<b>worst winds so far; modern, four-story hotel shaking to its frame</b>
9:45 pm	950.4	<b>in lobby, everyone's ears popped harshly at exact same moment; is wind lessening slightly? possibly...</b>
9:55 pm	947.9	<b>not calm, but wind seems to have less of an edge now; ears still popping; lobby flooded</b>

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## /2 – Eye

<u>TIME (CDT)</u>	<u>MB</u>	<u>CONDITIONS</u>
10:00 pm	943.9	significant calming; rain tapering; in the eye
10:20 pm	942.9	getting sporadic eddies—some bringing random, violent bursts—but winds have mostly lessened enough to walk around outside
10:31 pm	940.8	still in eye; major damage to building: most of exterior E-facing wall has collapsed
11:00 pm	942.9	still in calm eye; crickets chirping, some stars visible; heavy damage to hotel; reports of heavy destruction around town; hotel guests panicky, woman weeping
11:05 pm	941.8	stars in sky; occasional lightning illuminating a stadium eye
12 midnight	947.7	half of the hotel guests (families, elderly, children) have been evacuated to a concrete school up the road
12:10 am	949.5	wind seems to be picking up again; can hear howling, roaring sound coming from the S

## /3 – Backside

<u>TIME (CDT)</u>	<u>MB</u>	<u>CONDITIONS</u>
12:21 am	952.7	powerful winds returning
12:30 am	956.2	full-on hurricane again: powerful winds hitting building like a hammer; air pressure rising
1:00 am	965.5	powerful winds continue
1:15 am	969.5	winds seem to be losing their harsh edge—*maybe* not as strong now
1:30 am	973.6	winds definitely less strong...
1:45 am	976.9	lessening...
2:15 am	980.7	wind dying down; hotel badly damaged; horror stories coming in from around town

### Key observations:

- The **destructive core** of the cyclone (including the eye) took about **5 hours to pass**.
- The **eye** lasted approx. **2 hours 20 minutes**—from ~10 pm to ~12:20 am.
- The **lowest air pressure, 940.8 mb**, occurred at **10:31 pm CDT**, during the eye.
- **The cyclone's core was fairly symmetric**, with violent winds and heavy rainfall both preceding and following the eye.
- The **transition from the inner eyewall to the eye** (especially from ~9:45 to 10:20 pm) was turbulent, with short lulls seeming to alternate sporadically with sudden, random, violent bursts. There was also a harsh sensation of ear-popping at this time. This may have been caused by my **mesovortices**. The air-pressure data show wild fluctuations around this time. (For more about this, see **Air Pressure Data**, below).

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## Air Pressure Data

The author collected quality-controlled air-pressure data with a single Kestrel 4500.

The device was deployed in a safe place in the author's second-floor hotel room—on the bathroom-sink counter. The device remained undisturbed during the passage of the cyclone.

The sampling rate was one reading per minute (1/min).

### Calibration

Geographer James Hyde checked local data and estimated the ground elevation at this location to be **11 ft**.

To calibrate the device, the author used a **reference altitude of 28 ft**—which is the assumed ground elevation (11 ft) plus additional altitude to account for being on a countertop on the hotel's second floor.

### Data

The minimum pressure of **940.8 mb** occurred at **10:31 pm CDT (0331Z)**. This was during the calm eye.

The complete data are graphed in **Figure 3**, below.

### Inner-core Fluctuations

The air-pressure trace for this hurricane was not the traditional “V”—i.e., a steady, sharp dip followed by an equally steady rise—one expects to see during the passage of a severe, well-developed hurricane.

Rather, there were wild pressure fluctuations in the cyclone's core. The most volatile fluctuations occurred between 9:30 and 10:30 pm, especially during the transition from the inner eyewall into the eye. During this transition, winds were extremely sporadic, alternating between relative calm and sudden, great bursts. Radar imagery suggests the presence of mesovortices rotating around the perimeter of the eye, along the edge of the eyewall, during this time, and it seems likely these eddies were responsible both for the pressure fluctuations and the sporadic bursts of wind.

The most-extreme of these fluctuations occurred as the eye neared Rockport and winds were starting to slacken: the pressure plunged from 951.2 mb at 9:46 pm to 941.9 mb at 9:50 pm (a drop of almost 10 mb in just 4 minutes), then rapidly spiked almost 6 mb in the following 3 minutes. Interestingly, this happened around the same time the author (and several people in the hotel lobby) experienced a sudden, harsh, ear-popping sensation. (See the 9:45 pm observation listed under **Chronology**, above.)

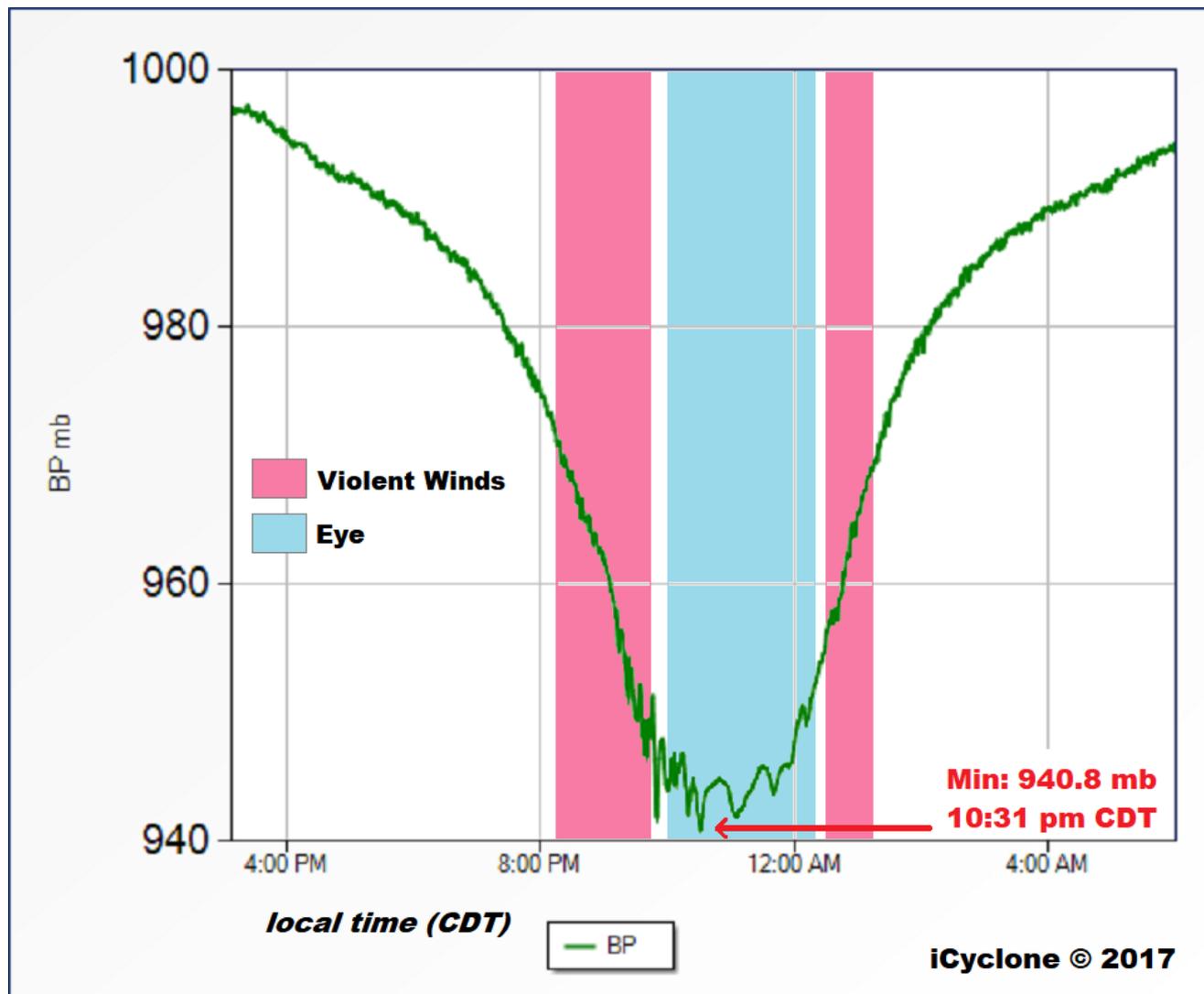
After about 10:30 pm, gentler (but still significant) pressure fluctuations continued in the eye up until a little after 12 midnight—at which point the pressure trend started to smooth out and rise more steadily as the center moved away and the backside of the eyewall arrived.

**Figure 4** is a closeup, zoomed-in view of these pressure fluctuations that occurred just before and during the eye.

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Figure 3: Barogram

Air-pressure data reveal the minimum value of 940.8 mb occurred at 10:31 pm, as the eye passed over Rockport.

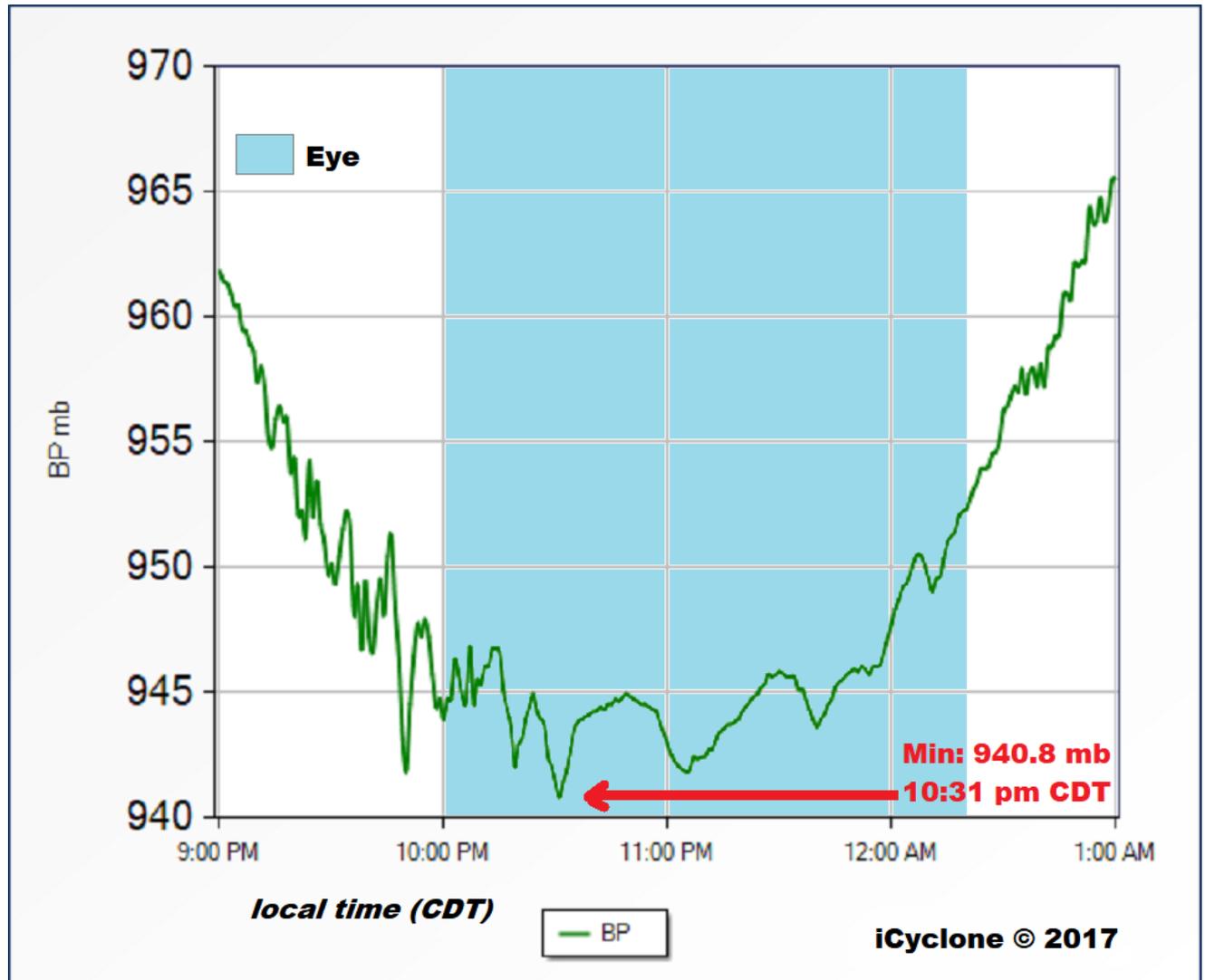


**HURRICANE HARVEY:** 25-26 Aug 2017  
Rockport, Texas, USA  
28.05795N 97.04096W – ref el 11 ft

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Figure 4: Barogram (CLOSE VIEW)

A close view of the hours during which the inner core of the hurricane passed over Rockport. Note the wild pressure fluctuations which may have been caused by mesovortices.

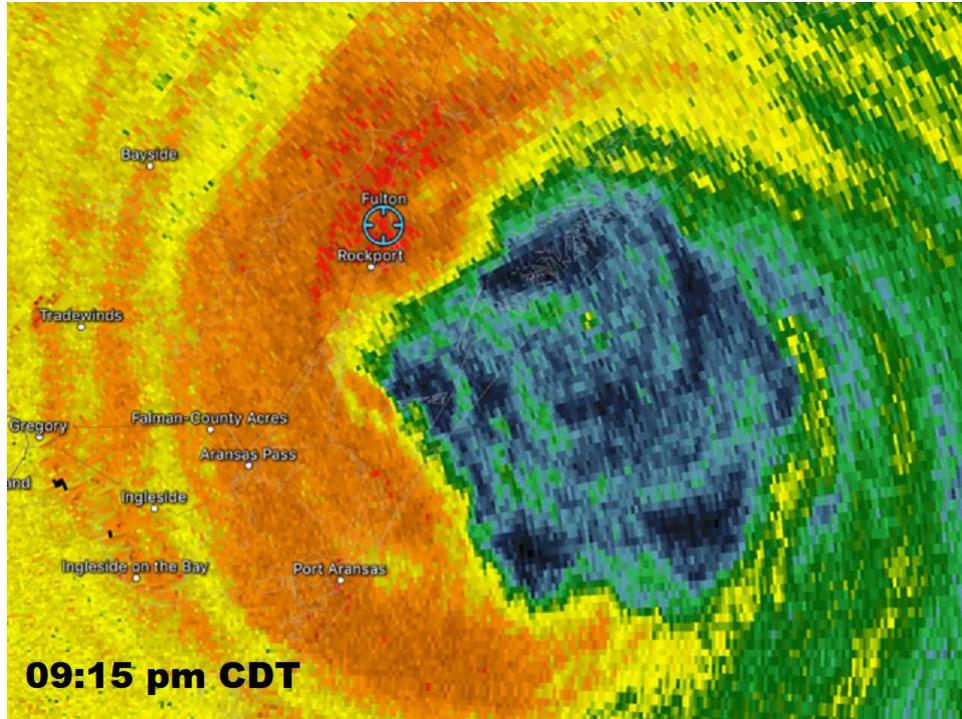


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28.05795N 97.04096W – ref el 11 ft      **CLOSE VIEW**

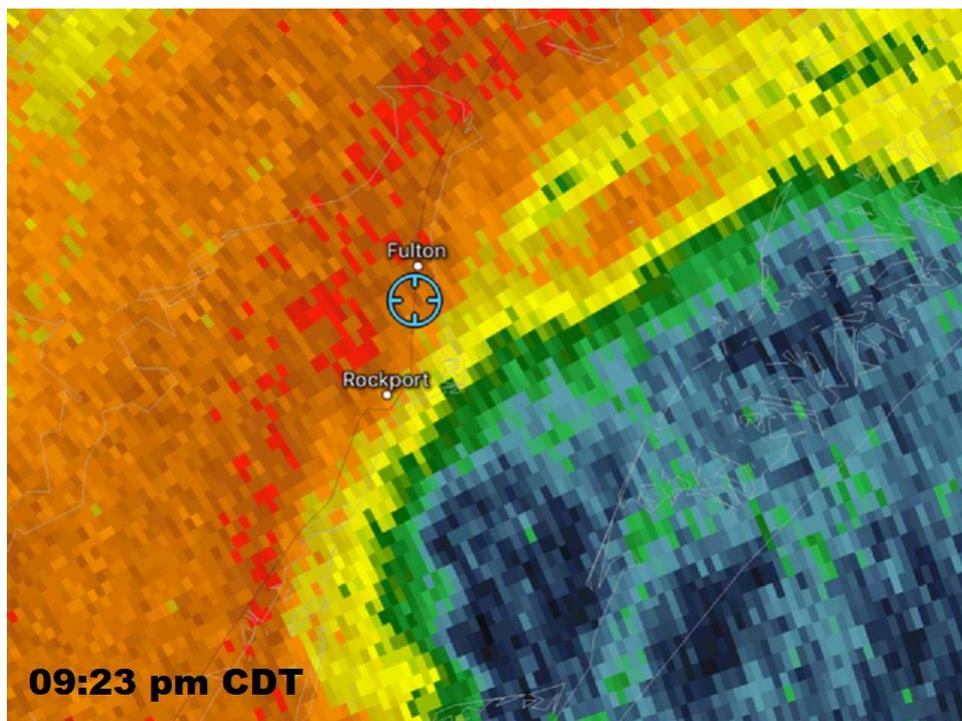
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## Radar Imagery

The following radar images show Hurricane HARVEY's core passing over the author's observation point (marked by the blue target symbol). (Image: RadarScope)

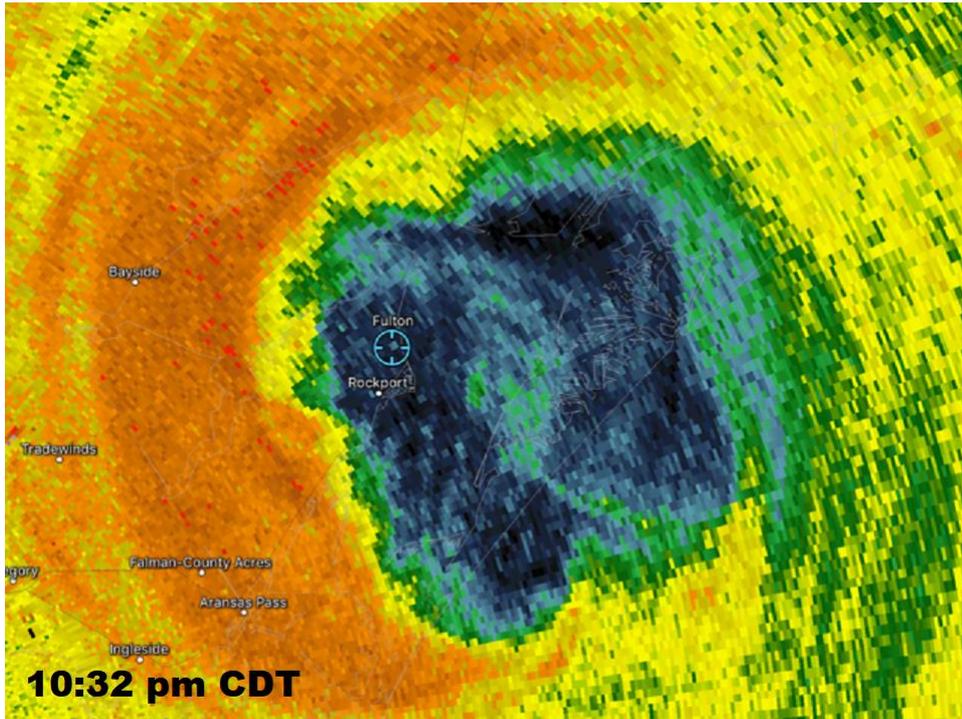


9:15 pm: Rockport was getting raked by destructive inner-eyewall winds. Mesovortex swirls are visible in the eye. (Image: RadarScope)

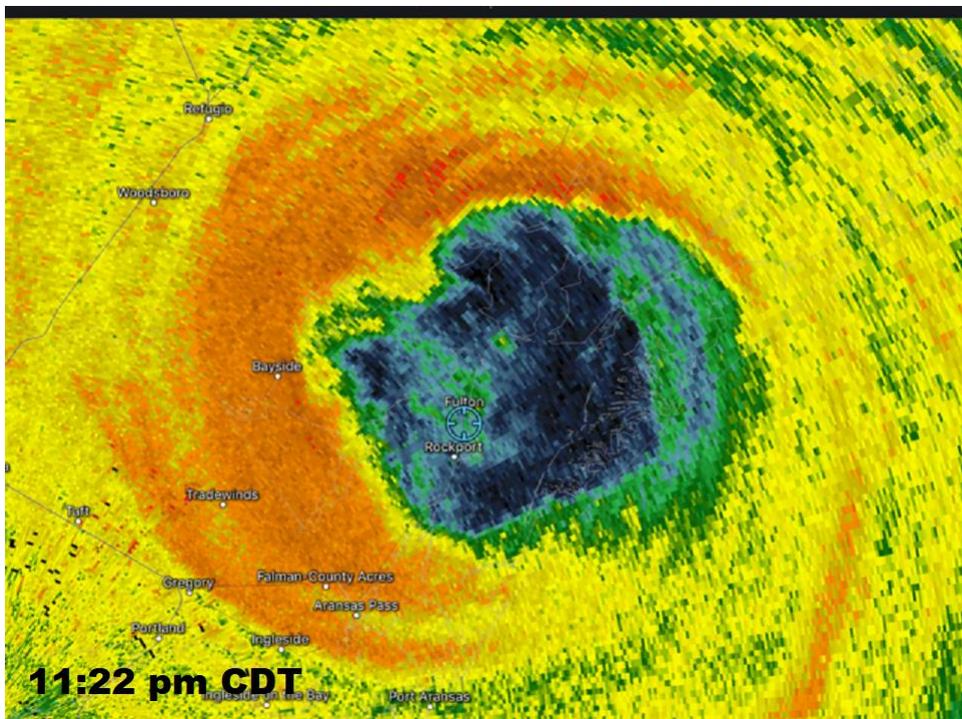


9:23 pm: The winds seemed to peak in Rockport as the eye edged closer. (Image: RadarScope)

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*10:32 pm. Rockport was in the eye and experiencing a lull, interrupted by occasional bursts of wind. The lowest pressure occurred at about this time (940.8 mb at 10:31 pm). (Image: RadarScope)*



*11:22 pm. Rockport was deep in the eye. Stars were occasionally visible in the sky. (Image: RadarScope)*

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## Damage

Wind damage across the direct-hit zone—Rockport and Aransas Pass—was extensive and in some instances heavy.

Probably a majority of houses and buildings got by with minor or moderate damage. However, there were plenty of examples of partial or even complete building failures—mostly older, wood-frame structures. Signs and power poles were down, and some RVs and trailers were overturned. Deciduous trees were mostly defoliated, with palm trees badly thrashed or even uprooted.

While immediate coastal areas were a mess, the author didn't see major storm-surge damage on the E shores of Fulton and Rockport. It seemed a massive surge didn't materialize in this area. However, there were reports of significant storm-surge inundation in Aransas Pass, and the waterfront downtown neighborhood wasn't easily accessible the morning after the hurricane.

Driving SW, wind damage seemed to get noticeably lighter as the author reached Gregory and Portland. HARVEY was not a large hurricane.

Following are images of the damage around Rockport and Aransas Pass.



***The morning after in Rockport. The hurricane was moving on, leaving the landscape blasted, scrubbed, and barren.***

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*Damage to the hotel where the author rode out the hurricane. Winds tore off much of the E wall.*



*Damage to the hotel, looking from inside. Winds tore off much of the E wall, exposing stairwells and rooms.*

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***Structural damage in Rockport/Fulton.***



***Structural damage in Rockport/Fulton.***

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***Structural damage in Rockport/Fulton.***



***Structural damage in Rockport/Fulton.***

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*Structural damage in Rockport/Fulton.*



*Tree damage in Rockport/Fulton.*

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**Structural damage in Rockport/Fulton.**



**Structural damage in Rockport/Fulton.**

# ICYCLONE CHASE REPORT



*Damage in Aransas Pass.*



*Damage in Aransas Pass.*

# **ICYCLONE CHASE REPORT**



***Damage in Aransas Pass.***



***Overturned vehicle in Aransas Pass.***

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## Video Footage

Everything described above can be seen in the author's 10-minute video summary of the event.

Find it on YouTube (<https://youtu.be/lSkFK0QyRS8>) or on the iCyclone Website (<http://icyclone.com/chases/harvey-2017.html>).

All of the footage is timestamped in local time (CDT).

## Questions or Feedback?

Get in touch:

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